European Distance and E-Learning Network (EDEN) Amldcpclac Proceedings

EDEN 2013 ANNUAL Conference

The Joy of Learning

Enhancing Learning Experience
Improving Learning Quality

EDEN 2013 Annual Conference

University of Oslo
Oslo, Norway

12-15 June 2013

CONFERENCE PROCEEDINGS

Edited by

Morten Flate Paulsen and András Szűcs
on behalf of the European Distance and E-Learning Network

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The Joy of Learning – Enhancing Learning Experience, Improving Learning Quality

E-learning, open and distance education have been increasingly important fields of intellectual excitement and innovative development. The challenges posed by the new technologies are permanent, students constantly keep teachers under pressure to develop. Human elements are moving to the forefront, employing creative methods and smart solutions. Standards and accountability have also been emphasized but personalization of learning, individual and collective motivation, enhancement of the learning experience, and an overall improvement of learning quality are gaining ever-increasing traction.

In Europe, despite economic and social pressures, there is a collective drive towards realising the creative potential. Learning is becoming more and more individualized and self-managed. Personalization helps foster motivation and engagement and supports awareness and motivation. Personal learning environments and personalized assessment (including learning analytics) offer resources to monitor and assess the process.

How can we do our best to make learning a thrilling experience for learners, including providing a sense of joy in the virtual classroom? – The question is an exciting one, discussion and debate provide a range of innovative theories and approaches, and help to invent new tools necessary to achieve the goals. Should they be about the smart use of ICT tools, new methodologies for enhanced learning experience, content management systems, or about fascinating inter-disciplinary solutions supported by e.g. game based learning, immersive environments, multimedia, etc., the answers will be dynamic or even provoking.

The EDEN 2013 Conference aims to discover and present the latest best practice in this field, share progressive concepts, inventive solutions, and promote joint-thinking and collaboration.

The conference key themes have been: engaging and challenging learners – enhanced learning experience by collaboration – learning-intensive physical and virtual spaces – the power and pleasure of sharing in learning – the sense of ownership, self-expression and development of personality – adding joy to teaching and learning by ICTs – virtual reality, media and gamification – leadership and the quality of learning – teachers as performers and the competences needed to enhance learning experience.

Norway is world leading in openness, digitisation and modernisation of education. The University of Oslo, a top national higher education institution as conference host offers great conditions and stimulating environment. The support and partnership of the Norwegian Association for Distance and Flexible Education (NADE) has been tremendously useful to involve great keynotes and to ensure smart involvement of the national and Nordic professional community and stakeholders.

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Steve Wheeler, University of Plymouth, United Kingdom

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EDEN Oslo Pre-Conference Interview Series

The 2013 Annual Conference "The Joy of Learning" was featured by an exceptional team of keynote speakers – world known and valued thinkers from different continents. In preparation of their contributions, interviews were done by outstanding EDEN scholars with them in the weeks before the conference.

We publish these interviews in the Proceedings because we trust that they may help to achieve better understanding of the conference concept and benefit for delegates.

EDEN thanks NADE, the Norwegian Association for Distance and Flexible Education for their great support which allowed to invite the best keynote speakers for the Oslo conference.

Living in the Age where "Knowing" may be Obsolete
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LIVING IN THE AGE WHERE "KNOWING" MAY BE OBSOLETE

Interview with Sugata Mitra by Steve Wheeler

The media and education worlds have been buzzing over the last few days about the work of a quiet, unassuming Indian born professor. Born in Calcutta in 1952, Sugata Mitra started his academic career in computational and molecular science. His later research also encompassed biological science and energy storage systems. Mitra has also researched diversely into areas such as medicine (Alzheimer's disease and memory research) and psychology (perception in hypermedia environments) and he received a PhD in Physics for his studies into organic semi-conductors. It is not hard to see why some have hailed him as a polymath and even 'something of a genius'. Most recently, Professor Mitra won the prestigious TED prize of 1 million US dollars acknowledgement of his work setting up computer kiosks in developing rural areas, and for his studies into 'minimally invasive education'. He is now Professor of Educational Technology at Newcastle University, in the North East of England. I managed to catch up with him to interrupt his busy schedule for a brief interview ahead of his keynote at the EDEN 2013 Oslo conference.

Steve: *Sugata, thank you for taking some time out from your busy schedule to speak to me, and congratulations on your recent TED prize. You have been an inspiration to many through your research, but what is it that inspires you the most in your work?*

Sugata: When the numbers from measurements come together I look for strong correlations – black and white with zero probability of error. Like in a Physics experiment. Sometimes I get results like that and I think, 'I guessed that one right'.

Steve: *A lot of your recent work has been around the use of technology in education. What benefits do you believe technology is offering to learners, and what evidence is there that it is making a difference?*

Sugata: In www.sugatam.wikispaces.com you will find several examples, including children teaching themselves to use the Internet on street side computers, and doing it well enough to pass a government examination on computers. Children in Kuppam teaching themselves

biotechnology 10 years ahead of their time and children in Uruguay whose reading comprehension in Spanish has jumped several levels because of their access to computers.

There are many other published results. Anecdotally, a student from a village in Maharashtra, India, is doing a Ph.D. in evolutionary biology with a scholarship to Yale. He says he got there because he used to read New Scientist from a hole in the wall computer in his village. A child from a slum in Hyderabad, India, is studying medicine with a scholarship in Kuala Lumpur, Malaysia. He got there with encouragement, advice and support from a 'Skype Granny' from England.

Steve: *These are certainly remarkable results, leading me to think that education is in need of change. What do you think are the main constraints preventing any significant reforms of education? And what might be done to overcome them?*

Sugata: There is a powerful belief that schooling should be done the way it is. All we need to do is improve classrooms, make teachers better and review the curriculum every five years. This is thinking from another century, so powerfully reinforced that we find it impossible to think any other way. Schooling does not need improvement, it needs to be reinvented. Every aspect of it – curriculum, pedagogy, assessment and certification. Some brave Government, somewhere, will have to take a plunge....

Let me give you an example. Here is one of today's examination questions: How long will it take a 5 Kg mass to fall to the ground if dropped from a height of 20 metres? (Do not use computers, calculators or any other aids. Do not talk)

This could easily be changed to: Use the Internet to find out how long it will take a 5 Kg mass to fall to the ground if dropped from a height of 20 metres. Discuss the answer with your colleagues and report the results of the discussion. Justify why you think the answer is right.

Steve: *That would certainly bring more relevance to learning, especially for children who have grown up with technology all around them. Let's talk about your recent work. You are known worldwide for your groundbreaking work in minimally invasive education. Can you explain what this is and why you think it is so important?*

Sugata: There are places on the planet where good teachers cannot or do not go. We have tried to level the playing field for a thousand years, unsuccessfully. We need an alternative. Children, given technology and left alone, seem to be able to level the playing field by themselves, probably because Computers and the Internet work the same way in the swamps of the Sunderbans as in Washington DC. Teachers don't work the same way, neither do parents. So, if there was a way of learning that had minimum dependence on parents and teachers, children everywhere would have a better chance. This is Minimally Invasive Education.

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Steve: *You seem to have attracted the nickname of the 'Slumdog Professor' in regards to the influence your research had on the making of the Slum Dog Millionaire movie. Is this something you are happy with?*

Sugata: I am happy that Vikas Swarup was inspired by my early work. I am not happy that self taught children should aspire to win game shows. They should do a Ph.D. instead, as, at least, one child from a hole in the wall computer has done. I love the name though!

Steve: *You tell stories about your contact with learners in remote or under privileged areas of society, many of which are inspirational. Which story (or stories) inspires you the most from your many travels?*

Sugata: There are far too many stories to tell, all of them incredibly inspiring. One incident came to my mind as I said the last sentence:

'You Sir, have crossed all limits of human decency!' said a child to another in a self organised learning session without teachers. The teacher and I giggled from the corridor for a long time. I don't know why I find this inspiring, but I like laughing.

Steve: *Following on from your hole in the wall projects in their various contexts, you developed the idea of remote mentors, popularly called the 'Granny Cloud'. Can you explain how this works and why it is important?*

Sugata: As I previously said, there are places on the planet where good teachers cannot or do not go. But they can, using Skype. There are retired teachers who miss children. Grannies can accelerate self organised learning. Put it all together and you get the Granny Cloud. You can get further details about this idea from www.solesandsomes.wikispaces.com

Steve: *Can you talk a little about your latest research interests?*

Sugata: There are several research questions I'm currently pursuing. For example, can a facility for children be operated remotely over the Internet? What will it take to build one? How can we get Key Stage 4 (14-16 year old) reading comprehension in children of age six? Is there a math (formula) that will explain how learning works?

Steve: *Those are quite ambitious research questions, and we will be very interested to hear of your results. I had dinner with Nicholas Negroponte recently and your name came up. He told me you have been involved with MIT, working with him and his colleagues such as Vijay Kumar in the Media Lab. Could you talk a little about your involvement there? Did your work there for example relate to Negroponte's one laptop per child movement?*

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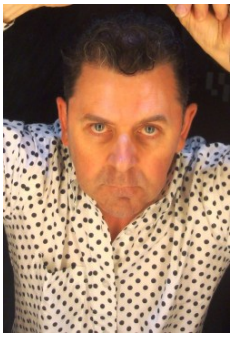
Sugata: I was there as a visiting professor for a year. I am not now. My work with Nicholas was on whether children can learn to read by themselves. We don't quite know yet. Nicholas framed a question for me, 'is knowing obsolete?' It is my biggest take away from the Media Lab.

Steve: *What is your vision for education in the next 10 years? What do you think needs to be done next?*

Sugata: We need to rethink the curriculum, rethink assessment and rethink certification in an age where 'knowing' may be obsolete. Homo Sapiens will transition to Homo Deus in the next 50 years. Our preoccupation will be with meaning and creation. Knowing will not be our main interest – creating will. In order to create we will need to know things. When we need to know something we will have the means and the capacity to do so in minutes. A page of erudite text may take an educated person an hour to understand. A century ago it would have taken a month. A thousand years ago, a year or more. We could extrapolate to a time when it will take us a minute to understand. A generation or two later, one second.

The human brain is evolving faster than anything has, ever before.

Steve: *Sugata, thank you for sharing your thoughts.*



Steve Wheeler is Associate Professor of Learning Technologies at Plymouth University, in South West England and a passionate blogger. Originally trained as a psychologist, he has spent his entire career working in media, technology and learning. He is now in the Faculty of Health, Education and Society. He teaches on a number of undergraduate and post-graduate teacher education programmes. He specialises in research on e-learning and distance education, with particular emphasis on social media and Web 2.0 tools. Steve is elected Member of the EDEN Network of Academics and Professionals Steering Committee and was named as the world's 4th most influential Twitter personality on the topic learning technology in 2012.

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WHY ANNA KIRAH THINKS WE SHOULD GET RID OF THE BLINDERS IN EDUCATION

Interview with Anna Kirah by Helen Keegan

When two like-minded people meet, an inspiring conversation is the result. This is exactly what happened when Helen Keegan agreed to interview EDEN 2013 keynote speaker Anna Kirah. Helen took the initiative and started a virtual conversation with Anna, sending her only one question at a time. This way Anna had the time and space to explore her ideas and create the story-teller texture feel of the interview. Thanks to the wonderfully open discussion, don't be surprised if new questions and answers appear with the time. It's worth to come back and check on new updates! Now, sit back, relax, take your time and let yourself be inspired.

Helen: *Thank you for agreeing to be interviewed in advance of your hotly anticipated keynote at the 2013 EDEN Conference. As one of the very few keynote speakers to be invited back for a second time, your speech in Lisbon (2008) is remembered with a great deal of enthusiasm as the participants found you so very inspiring!*

The main theme for this year's conference is The Joy of Learning. In your TEDxTalk, you offer some wonderful examples that demonstrate the importance of understanding the aspirations and motivations of everyday people in their everyday lives, and working together towards a common goal. Could you share your perspectives on the conference theme, based on your experiences as a design anthropologist specialising in people-centred innovation?

Anna: First of all, it is an honour to be asked again to hold a keynote at the EDEN Conference.

We have come to the point where I believe we need to stop talking about digital learning tools, face-to-face learning tools and talk about the tools of learning. In fact, I would argue we need to take the "e" out of e-learning. The joy of learning has to do with our ability to give our students, whomever they may be, the tools to learn and the tools to motivate themselves to learn what they need to create meaning in their lives. The joy of learning is about encouraging curiosity and creativity. One of my favourite quotes in life is:

> *"There is no content of knowledge that is not pertinent to the work you will want to do." – Ben Shahn*

We must help people learn HOW to learn, but not what to learn. We can set guidelines, we can set a framework, and when necessary we can even set the most important rules – but learning is ultimately about creating and or finding meaning.

Let us take schooling and education. Why do we go to school? It is to learn the ways of the culture we live in, the stories and truths of the culture – a connection from the past to the present and to the future. It is about integration, being unified in ones self vis a vis the cultures one lives in (for we do not live in just one culture anymore). We are living in a world today where authority and power is becoming flattened due to our access to knowledge. And yes, knowledge is power. Knowledge is no longer something which is holy to the few who have studied a topic. Knowledge is no longer something which is only for the "experts" it has become democratized. This of course also changes how we learn.

I am forever sighing when I hear the antiquated debate around WIKIPEDIA as a tool for learning. Of course it is a tool for learning! It is far more effective than the static textbooks of yesteryear. We need to teach HOW to read Wikipedia, how to arrive at an informed opinion on just about any topic you can imagine – (for example – note and read the references in any article). What is amazing about Wikipedia is that it is ever changing, just like our cultures our changing, just like history is changing, just like our language is changing – knowledge changes over time and space and Wikipedia has the elasticity and flexibility to handle change and at the same time hold on to the past connecting it to the present and adding thoughts to the future.

The people-centred approach to innovation on any front – be it a service, a product or even organisational change must come from a collaboration across silos, across stakeholder, across different target groups because it is through collaboration that we find meaning.

If we take the democratization of learning in to account, then all must be allowed to influence how they learn in order to motivate them to learn more. I encourage us all to stop creating tools for learning for people and start creating tools for learning "with" the very people we serve.

Helen: *I'm interested in your ideas around curiosity and the motivation to learn. I often feel as though our traditional institutional/educational structures stifle curiosity. Through quality assurance processes (which are essentially about mitigation of risk) learning is chunked into discrete units, which can be measured, categorized and ranked. However, these processes seem to be more focused on our learners' extrinsic motivation (i.e. assessment focused), as opposed to the intrinsic motivation that comes from deep curiosity. Could you tell us more about your approach to motivating others and your strategies for developing a deep sense of curiosity with the people/organisations with whom you work?*

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Anna: When my eldest daughter was two years old, she loved two things: a kind of cookie (biscuit) and my chicken soup. My chicken soup took 12 hours to make, a slow shimmer and then straining all of the bones and fat out. When the soup was finished, it rested on the kitchen-counter to turn into jelly and then it was certain that it was "just right". Well, one day I entered the kitchen and I found my daughter putting cookies in to the soup. I was horrified and yelled out: "WHAT ARE YOU DOING?!" My daughter looked at me indignantly and said: "I am making Cookie Soup". There are two points to the story:

1. This is actually one of the definitions of innovation, and perhaps my favourite: putting two seemingly unrelated things together to make something NEW that is MEANINGFUL, RELEVANT, DESIRABLE AND USEFUL!
2. EVERY single one of us is born curious and creative and most of us unfortunately have both this innate curiosity and creativity drained from us by our parents (by for example, not encouraging the acts of cookie soup), by our school systems (forcing us in to averages, forcing us to learn what we are told to learn), by our places of work (for example, the politics at the workplace, by power dynamics that determine what ideas actually surface and become utilized in efficiency and improvements).

We grow up with blinders that become stronger and stronger. We need to learn to take these blinders off and that is what I consider to be my most important task when working with organisations – how to remove our blinders. We need to bring back cookie soup into our lives, we need to find that curiosity in ourselves (start asking "why" more frequently) and bring back that beautiful innate creativity (dare to try new things, dare to mix things a bit, dare to learn from our youth who are much wiser than we are).

Things are getting worse, not better. My stepdaughter is 16 years old and her first year of Norwegian high school. Her textbooks are printed books and are written terribly. She came to me with her sociology book and read a paragraph to me because she was confused. It was about the pros and cons of globalization. One of the cons was that "globalisation weakens culture". She had asked her teacher about this, but her teacher was busy teaching and said to focus on the text for the test. She asked me what I thought.

Now here is the sad thing, I want my daughter to get a good grade on her test so I tell her to follow the book. BUT I also tell her that the book is crap. Culture is not a static thing, it never has been. Culture changes, culture evolves but culture is not weakened. I do not have the space to go in detail here, but imagine, if this book was digital, imagine if this book was dynamic. Imagine, if people could place their comments in the text and discuss it, imagine, if experts in culture and anthropology could put their own thoughts into this text and help the children learn more about what they are curious about? Imagine, if we allowed them to learn MORE than is in the textbook! Imagine, if the measure in school was how well the teacher had encouraged creativity and curiosity in his/her students?!

The only way I know how to bring back the importance of creativity and curiosity is by showing its value and that is a journey that starts by listening to the challenges of any given

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organization and by helping them find in context their own blinders. When the blinders are removed, they themselves see the great potential in meeting people where they are, in living in the question instead of jumping to solutions, in diving into the possibilities instead of making quick fixes that ultimately cost us more on the long run. We need to create viable solutions to our future and that starts by taking a step back and being willing to remove our blinders and understand the aspirations and the motivations of the people we create for and start creating with them.

I will touch upon these topics in my talk at the conference and I have a surprise up my sleeve which I hope will be something that all of us can enjoy and learn from!

Helen: *The metaphor of 'removing the blinders' is extremely powerful. I guess that magical moments, such as when you recognised the innovation in your daughter's Cookie Soup (yum!), are things we must remain open to – we all need to keep an open mind. It can be really difficult to remain open to the world around us by retaining an almost childlike sense of wonder – and yet it's so important both personally and professionally. In terms of formal education, where do you think are the biggest 'blinders'?*

Anna: This is a very good question and could be the topic of a book. I will try to narrow it down a bit to just a few of the blinders in formal education. The first being arrogance. Educators who believe they know more than their students is one of the most dangerous blinder I encounter regularly. Educators who are afraid to go in dialogue with their students and perhaps even coming up with something more powerful than what they know. Things have been turned upside down with the onset of the internet The information highway that has become so accessible (causing a demand for transparency) has made it possible for even a young child to have more knowledge than his or her teacher. This requires educators to be humble to be flexible and to be adaptable to change. Educators must be willing to lead their students to the beauty of learning, the motivation to learn as opposed to what needs to be learned. Our entire curriculum needs to address this. We have come to a point that the democratization of learning requires a flattened power structure where teachers become facilitators of learning instead of knowledge holders. We need to educate our students to be knowledge seekers and to make informed decisions on the abundance of information at their fingertips.

I would also like to take on the concept of PhDs as a blinder. The entire idea of a PhD creates the "expert blinder". The concept of a dissertation as a solo project, where one is required to prove individual knowledge and competency endangers the power of flexibility and adaptability to change. Innovation has almost always been a social phenomenon – we are social beings and new ideas come from observing others, dialogue with others and collaborating with others. Why can we not create collaborative PhDs? There is room for both subject matter experts (individual PhDs) and collaborative PhDs that teach us the value of collaboration and how working together brings us to another level of understanding.

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Our current model is limiting. When we finish our PhDs, we are focused often on our own expertise and we are pushed in to a world where we strive to continuously prove ourselves at an individual level. The challenge is how can we be experts and at the same time be willing to be open to opportunities. The most common challenge within an organization is that people see themselves as experts in their own area and become defensive and threatened when, for example, a lay person or non-expert comes up with a brilliant idea that disrupts their way of thinking or doing.

Today, almost anyone, if they so wanted, could become an expert in an area (due to the availability of information online) and challenge the status quo. I am working on two public sector projects, one in transportation and one in health – in both of these projects there is a tension between the users of services and the "experts" creating the services. Most of my work is in facilitating this tension. This brings us back to the issue of creating WITH the people we serve and not for the people we serve. When we understand the aspirations and motivations of the people we serve, we find meaning. From meaning we can create together meaningful, relevant, useful and desirable services for the people and with the people.

My partner is building his own three story house. He is not trained as a carpenter, he is a theologian with a dream. He is building it step by step from reading online. The builders in the village come and speak with him and look at his work. What they say is that his craftsmanship is far better than the majority of builders today. This is possible for him because meaningful and relevant information is available online. The real challenge for e-learning is how to make information easily obtainable, easily usable in the context that an individual needs to learn.

Helen Keegan is senior lecturer in the School of Computing, Science and Engineering at the University of Salford and Programme Leader for BSc (Hons) Professional Sound and Video Technology. In 2012, Helen has been awarded a National Teaching Fellowship, one of the most prestigious awards for excellence in higher education teaching and support for learning in the UK. Helen is a pioneer of using social media technologies to transform students' learning. With an educational background which crosses arts and sciences, she has a degree in linguistics and developed an international reputation for originality and digital innovation, actively using a wide range of social and mobile technologies to develop and disseminate her ideas, and constantly improve her teaching. With her students, Helen focuses on learner-driven curricula, helping them develop an online presence and an improved understanding of the internet. She is an executive board member of the Digital Cluster – a centre of excellence which combines and leads on high quality research, enterprise and teaching in the areas of informatics, digital media, and new and convergent technologies. Helen runs her own blog and is active on Twitter (@heloukee).

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EDUCATION AND ECSTASY INSTEAD OF EDUCATION AND AGONY

Interview with Bernard Luskin by Eva Suba

Learning psychologist Bernard Luskin has a series of prizes and an entire career in academic institutions. Dr Luskin is considered as one of the pioneers of open, distance and e-learning in the academic world of USA. He revealed earlier, that he will explore psychology of learning & social media in his EDEN Annual Conference keynote speech sharing new knowledge in media psychology that improves learner motivation, provides inspiration and enhances learner satisfaction leading to increased student success. With all the new hypes and buzzing field of technology-enhanced learning, I was interested what his thoughts are on how psychology and learning interact with each other.

Eva: *In your interview of 2006 you said you think we've just barely scratched the surface yet in the use of media and learning. Where are we standing now 7 years later?*

Bernard: A great deal of rapid identifiable change has occurred in the past seven years since my previous EDEN keynote presentation. MOOCs, Linkedin, Facebook, Google, Bing, Blogging, Webinars, Pod Casts, eBooks and other services have started. Twitter has become quite significant and learning technology has moved forward apace. The MOOC has entered the scene and is creating stimulating conversations and controversy in education. Distance learning has passed the tipping point and the future of distance learning is increasingly clear. Some states, such as California are going to offer distance learning courses in general education, state-wide to help alleviate the lack of campus availability. The whole field of learning, from K12 through higher education has advanced. Politics continues and the regulators abound, but once generational acceptance was established and the tipping point reached, the future revealed itself. However, at this stage we have only scratched the surface of the future of distance education …but we have scratched it together.

Eva: *Coming from the highly evolved US open learning culture, how do you see the European ICT enhanced learning, e-learning, distance education development?*

Bernard: Distance is dead. Distance has been overcome by technology and media psychology. There are still many country boarders and language barriers to worldwide applications in

distance learning. However, the European e-learning world has advanced and there is much more international cooperation than in the past.

Eva: *Brain sciences are rapidly evolving giving us more and more information on how humans and animals actually learn. What are the overlapping areas in your opinion, where media psychology, brain sciences and learning technology create meaningful synergies for learning research?*

Bernard: Brain Science has moved to the forefront of research on learning. New findings from magnetic resonance imaging have enhanced the credibility and understanding of NLP, i.e., Neurolinguistic programming, our understanding of brain plasticity and learning and the knowledge that learning in a positive way can overcome genetic and cultural limitations. This is increasingly understood by scholar practitioners advancing the fields of media psychology, media studies and distance learning. Positive psychology and positive mastery have been widely recognized as ways to improve both individual and group results. New degree and certificate programs in media psychology and media studies are providing a new wave of leaders for the future. More new graduate programs and courses are needed. The opportunity is now.

Eva: *What are the latest findings of media psychology you find highly relevant for today's K-12 and higher education?*

Bernard: There is increased recognition that media psychology is learned one theory at a time. Theories of attention, persuasion, control, mastery, positive psychology, Neurolinguistic programming are now foundational in course development and best practices in teaching and learning. Pscybermedia is a neologism that has become more widely understood. In dissecting a new word such as, Psybermedia, we find that Pscy, i.e., psychology, the study of human behaviour, cybernetics, i.e., artificial intelligence, and media, i.e., pictures, graphics and sound, i.e., pscybermedia, has moved into the scholar practitioner lexicon.

Eva: *Some years ago you foreseen that graduate professional education is going to become sophisticated due to the ubiquitous needs of learners while undergraduate programs will grow significantly. Where do you think the world of learning is right now? Was your prognosis correct?*

Bernard: My various prognoses of seven years ago were correct. The world of learning has advanced. The understanding of brain science, including NLP, Neurolinguistic Programming and understanding that brain plasticity can offset genetic and cultural limitations and have substantially advanced learning psychology. Media studies that assess the results of technology and learning are bringing new knowledge. Learning management systems and student information systems have improved. It is increasingly recognized that that the teacher is at the centre of best practices and that personal attention can make the difference between success or failure. New knowledge is helping the traditional learner, the adult learner and is bringing new insights into the ways we work with all types of learning disabilities.

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Eva: *The internet and media has fundamentally transformed mainstream education. How do you think massive open online courses' (MOOCs) will evolve in the context of learner demand?*

Bernard: MOOCs have a place in education at all levels. There will be credit aggregators who partner with the MOOC providers in order to monetize and grant academic credit for courses offered. Many schools, colleges and universities will begin to accept this credit.

The MOOC is a new variation of learning opportunity now growing among the many ways that people gain information. Ways include personal discovery, traditional classroom offerings, formal distance degree and certificate programs and more. The answer to the question regarding how the best people learn can be summarized the recognition that successful individuals learn "any way they can."

Eva: *Psychology is a course most teacher training institutions build in to their curricula. Do you think there's a need for institutions to consider media psychology as part of the same curricula? If yes, how do you think it could be woven into the texture of teacher training seamlessly?*

Bernard: Media psychology courses should be offered in all programs in higher education and especially in leadership programs and in teacher education. Understanding psychology is fundamental to learning. Media psychology cuts across all programs and the understanding of theories in psychology applied to media is more important than ever. Understanding media psychology and applying media psychology in the learning world is a 21st century learning imperative. Media psychology can be seamlessly blended into teacher education programs and also included in specific courses.

Eva: *Motivation is one of the keywords when talking about learning. What is your biggest motivation in your current work today?*

Bernard: As president elect of The Society of Media Psychology and Technology, Division 46 of the American Psychological Association, I have given priority to

1. encouraging colleges and universities to offer new degree and certificate programs in media psychology and media studies,
2. to increasing greater understanding of the nature of media psychology,
3. to supporting the principle that psychology is best learned one theory at a time and then applied to media, and
4. to supporting new research initiatives in media studies so our knowledge about media and behaviour continues to grow.

Eva: *This year's theme for the EDEN Conference is the Joy of Learning. What is your message to the conference participants in preparation for the event?*

Bernard: These are exciting times in education and learning. My personal theme is always "education and ecstasy". I believe it should replace the old theme of "education and agony". You become what you think. Positive psychology, the idea of mastery, the growing research

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that shows that psychovisualization of perfect practice leads to positive results, and the dramatic growth in understanding how people learn now paves the way to the future of a world of learning that is full of joy.

Knowledge is information put to productive use. The EDEN conference is particularly relevant for those who believe in what they are doing. This includes those of us who are advocates of distance education and media psychology. We believe that it is important to think positively and that the goals of better learning will be achieved through our perseverance. We must work together to see the world from each other's viewpoints. This will give us a basis for forming and sharing fresh perspectives. The "joy of learning" worldwide will continue to spread. Learning methods and practices will change as we do. We have all of the pieces and we are putting them all together.

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STORIES OF JOY AND DESPAIR IN THE VIRTUAL CLASSROOM

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Introduction

A new generation of digitally mediated distance education has fundamentally changed the tertiary education landscape (McKee, 2010). Online learning presents a real opportunity to develop large-scale, cost-effective offerings to meet student demand for flexible learning in blended and distance scenarios – both onshore and overseas (Online Learning Task Force, 2011). Throughout the world, in 2010 an estimated 17 million students were studying through open and distance teaching institutions and this figure is growing exponentially (Guri-Rosenblit, 2010). A recent surveys suggests that 31 % of higher education students now take at least one course by distance in the United States (Allen & Seaman, 2011); this figure compares with 26 % in New Zealand (Ministry of Education, 2010) and 19 % in Australia (DEEWR, 2010), although the accuracy of these data needs to be treated with caution.

Importantly, Bourke and Simpson (2011) also caution participation levels need to be seen in the context of wider challenges around retention and completion. Historically many distance education programmes have struggled to achieve greater than 50 % retention. At the Open University in the United Kingdom, it has been reported that only 22 % of undergraduate distance students complete their study within eight academic years (HEFCE, 2009). Globally there is no agreed threshold of the typical or acceptable dropout rate among distance learners (Nichols, 2011) and there is limited understanding around what actually happens to first year distance students once they have enrolled in tertiary institutions (Bourke & Simpson, 2011).

Distance education is common among mature-aged lifelong learners (Poskitt, Rees, Suddaby & Radloff, 2011). Bates and Sangra (2011) acknowledge that lifelong learning has become critical for the economic development of knowledge-based economies. Lifelong learning tends to be undertaken part-time. Among higher education students in Australia, 79 % of external students study part-time; compared to 23 % of internal students (DEEWR, 2010). Employment is one reason for part-time enrolment. Data from New Zealand reveals that distance students commit to an average of 17.6 hours per week to paid employment compared to 12.9 hours by campus-based students (Poskitt et al., 2011).

Against this background, Krause, Hartley, James and McInnis (2005) found that first year students committed to more than 12.5 hours employment per week tended to be more likely

to consider dropping out. Moreover, Tyler-Smith (2006) reminds us that the number and age of dependents alongside the pressure of earning an income to support the family can negatively impact on a distance student's engagement with their learning. Overall, Poskitt et al. (2011) conclude that data relating to campus-based students cannot be transferred to distance students because they have a very different student experience and engage with their study differently.

The affordances of new digital technologies, which enable the dynamic update of learning resources on an ongoing basis and facilitate interaction between students and teachers, address many limitations of traditional models of distance learning (Guri-Rosenblit, 2012). However, Harnett, St George and Dron (2011) caution that online learning is not a positive influence on distance education by its inherent nature. Crampton, Ragusa and Cavanagh (2012) add that technical solutions not informed by effective pedagogy can translate into poorly designed or executed resources that potentially waste student's time. Furthermore, Jones, Ramanau, Cross and Healing (2010) report that some distance students are truly engaged in a range of digital activity at frequent intervals; while others rarely utilise the digital resources at their disposal.

Against this background, this study examined what factors influence the student experience during the first few weeks of distance learning. The intended outcome was to inform the future design of strategies to support student engagement and success.

Methods

The overarching methodology was Design-Based Research, which was chosen to guide the development of enhanced educational outcomes. Design-based research has increasingly received attention from researchers in education for its interactive and integrative qualities (Reeves, 2006). It aims to make a grounded connection between research and real-world contexts. This methodology can be thought of as seeking to develop best practice in complex learning environments through the incorporation of evaluation and empirical analyses, from which multiple entry points for various scholarly endeavours arise (Anderson & Shattuck, 2012).

Within the overarching methodology, the research drew on phenomenological data gathering methods to study the experiences of first-time distance learners from their own point of view. With permission from the University's Human Ethics Committee, enrolment data was obtained for 750 students studying via distance for the first time in Semester 2, 2011. The method of recruitment was by email from the Project Leader to all potential participants at the point when their enrolment had been approved. The invitation included a Participant Information Sheet, which explained why students might consider recording video diaries for the purpose of research.

One hundred and forty students volunteered to participate from which 20 were purposefully selected (Table 1). The intention was to broadly represent the demographic and geographic

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diversity of first-time distance learners. The profile of diversity was informed by a demographic analysis of the University's distance students during the 2010 academic year. Selection criteria included: age, gender, ethnicity, geographic location, subject of study, level of study, entry qualification, along with prior or current experience of tertiary study on-campus.

Table 1: Summary of the participant sample

Gender	Male (7), Female (13)
Age	Under 25 (4), 25-29 (4), 30-39 (6), 40-49 (4), 50-59 (2)
Ethnicity	Pakeha / European (12), Māori and/or Pasifika (8)
Location	A campus town (11), Other urban town (3), Remote (4), Overseas (2)
Mode	Distance only (17), Mixed mode (3)
Total papers	Undergraduate: One (6), Two (6), Three (0), Four (6); Postgraduate (2)
Subject	Business (8), Humanities (6), Education (3), Sciences (3)
Prior education	High school (8), Diploma (2), Degree papers (5), Degree (5)
Employment	Full time (11), Part time (3), Casual (1), None (3), Full time mother (2)
Dependents	None (11), One (1), Two or three (5), Four or more (3)

Using Sony bloggie™ cameras, video reflections were gathered using a diary technique adapted from previous studies. Riddle and Arnold (2007) used the Day Experience Method to investigate everyday life situations. They required participants to record written answers to specific questions sent at irregular intervals (between 30 and 90 minutes) between 8 am and 10 pm on three separate days. In contrast, Cashmore, Green and Scott (2010) adopted a free-form approach to video diaries in a longitudinal study with undergraduate students at the University of Leicester. The present study adopted an approach that struck a balance between a structured and free-form approach. The expectation was for five minutes of video footage per week, although the key factor was not one of length but forthcomingness and insightfulness of the reflections provided. A reflective prompt protocol was designed to encourage free-flow reflections whilst providing fish-hooks to elicit targeted categories of information in a lightly structured manner. Within 48 hours of receiving a participant's video file, the Project Manager would respond via email with a fresh set of reflective prompts for the following week.

Consistent with a phenomenological approach to understanding experiences in participants' own words, a grounded theory approach was applied to the process of thematic data analysis. Thematic analysis is a technique for identifying, analysing and reporting themes within data. A theme captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set (Braun & Clarke, 2003). By following a realist approach, the student voice was retained at the forefront of the analysis. In other words, participants' experiences were described as fully as possible to

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retain a sense of context. Within the limitations of a grounded theory, an inductive approach (bottom-up) was applied, which meant that the major themes arose from the data.

Results

Twenty-two hours of video data was collected from twenty first-time distance learners: Andy, Beth, Chris, Deborah, Emma, Fiona, Geraldine, Hannah, Ian, Jack, Kane, Libby, Maggie, Nathan, Olivia, Penny, Rachel, Susan, Tom. All names are pseudonyms. Four themes arose from the data that featured aspects of joy and despair:

1. Motivating factors;
2. Inhibiting factors;
3. Seeking support and
4. Learning approaches.

Motivating factors

Participants spoke with enthusiasm about their decision to study by distance. The majority of participants were excited about the opportunity afforded by distance education to study in spite of their daytime responsibilities. Several explained that today's world did not afford them the luxury of being able to fund tertiary level studies without simultaneously earning a full time salary. Others were committed employees who described distance education as after-hours professional development. Those with dependents reported that it was neither viable nor desirable to relocate the family home to pursue campus-based education. For some, excitement was associated with affective reasons such as moving on from past regrets towards a brighter future for themselves personally and their families. Particularly prominent among female participants in this group was the association between further education and a sense of self-worth, as Hannah described:

> *I just want to achieve something really good for me inside instead of just being a mum and sitting at home waiting for my husband.*

Inhibiting factors

Participants spoke with despair about complex factors that inhibited their ability to study efficiently. Sub themes have been grouped as (a) daytime commitments; (b) unforeseen circumstances and (c) study preparedness.

Most participants had daytime commitments to juggle alongside study. Early in the semester, many reported feelings of being torn between the pressure of work and study. Working more than 50 hours each week, Geraldine withdrew while Jack reported that his mind did not function after a day at work. Furthermore, almost half the participants lived with dependent children, which seemed to affect men and women differently. Although fathers were active parents, they appeared to have partners who assumed primary responsibility for childcare. In subtle contrast, mothers seemed to perceive themselves as the primary child caregiver, with

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that role not as apparent among their partners. Penny described the kind of despair that touched many of the mothers:

> *I have had thoughts that this is not the right time to study because I can't get my children around giving me the time to study; my family is not on the same page as me.*

Almost all participants experienced unforeseen issues over the course of semester. In terms of health and wellbeing, some reported feelings of tiredness and exhaustion, while others were stalled by more serious winter viruses; as well as the reoccurrence of longer-term health concerns. Libby and Kane reported their children had been hospitalized, while Rachel's health complications led her to withdraw in the second week. Moving house during the course of semester was an additional unforeseen circumstance for one quarter of participants. For others, it was the distraction of leisure pursuits that caught them by surprise. Jack despaired that his gym routine was unmanageable alongside full-time employment and four units (papers). Deborah and Fiona were distracted by their social calendars. Other participants found themselves engrossed in the Rugby World Cup 2011, which took place at the time of data collection. Olivia reflected upon unexpected financial difficulties:

> *I've had a lot of money problems this week. It really upsets me and distracts me completely. It makes studying really hard when you're worrying about how to buy the groceries.*

In terms of preparedness to meet the academic expectations of study, more than one third of participants were returning to study for the first time since high school after an interval of more than a decade. From within this group, some struggled to find effective study techniques to meet the demand of university-level study. For example, Libby reported that guidelines on how to write an assignment did not make a lot of sense to her. Two-thirds of participants had prior tertiary-level experience. However, reflections suggested that their study skills had been heavily conditioned to an internal learning environment and that distance study techniques were not necessarily intuitive. A few participants were limited by access and ability to use digital technology; while others were limited by relatively low levels of digital learning fluency, i.e. not necessarily perceiving the digital environment as an important place for learning. Ursula reported feeling overwhelmed by digital technology:

> *Go in to Moodle, 'blaaa' too much information. There's all this technology, all these sites and I'm not really too sure what I'm supposed to be doing in any of them. It's like overload.*

Seeking support

One quarter of participants were categorized as 'Avid Support Seekers'. They enjoyed a range of virtual spaces and campus spaces to interact with others for academic purposes. This type of participant was particularly interested in contact with lecturers for the purpose of discussion, reassurance and feedback. To this end, Avid Support Seekers typically attended

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contact courses, which they described as the highlight of their learning experience. However, they also engaged early with the distance library website and the learning support website provided by the University's Centre for Teaching and Learning. Furthermore, they regularly contributed to online discussion forums with fellow students via Moodle or Facebook groups. Beth went one step further with a blog:

> *My blogs they've been really good, they've had some retaliation which has been nice so it's been good to argue about what's on my mind.*

Meanwhile, three quarters were categorized as 'Self Sufficient Learners' who made limited use of virtual learning spaces. They did not frequent campus and they did not attend their contact courses; sometimes because they attributed little value to the opportunity. Kane was content with contacting his lecturer exclusively via email, while others preferred to make no contact whatsoever. Emma resolved to meet with her lecturer but later admitted that the meeting never eventuated due to her own laziness. Similarly, Self Sufficient Learners initiated barely any interaction with fellow students – either online or in person. They had mixed views about the benefits of discussion forums on Moodle and the role that these played in their learning experience, as Ursula described:

> *I still take a deep breath before I read the forums because there is a lot of waffle and I feel that I'm missing the point.*

Learning Approaches

An 'Active Approach' was apparent among a minority of participants. One aspect of such an approach was strategic learning. This type of learning was characterised by giving careful consideration to assignment questions long in advance of the deadline, which enabled participants to enjoy a steady and reflective approach to the reading and writing process. They established a sustainable study routine that accounted for predictable as well as unpredictable distractions and, in the face of adversity, they maintained a positive attitude. A second characteristic was deep learning when participants embraced study, not so much as a task but for personal enjoyment. Nathan was a rare example of someone whose study was relevant to their field of employment, which was a dynamic that contributed significantly to the depth of his approach:

> *Life does get busy but study is a priority for me mainly because I'm learning so much from the readings. It's amazing studying at this level again*

Meanwhile, data suggested that three quarters of participants struggled with a 'Passive Approach' for prolonged periods of time. The reasons were complex but frequently perceived by participants as beyond their own control. A sense of dependency (e.g., waiting for someone else to solve their problems) was particularly common (although not universal) among participants with little or no prior tertiary experience and/or those returning to study following a prolonged absence. These participants invariably reflected on a genuine desire to

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embrace their studies but appeared to be inhibited by relatively traditional conceptions of study, as Susan described:

> *I have a lot of reading to do and I'm not sure how I am going to cope. It's been a horrendous month and I have to work hard to get on top of things.*

Discussion

The purpose of the current study was to examine factors that influence the student experience during the first few weeks of distance learning. In concurrence with Poskitt et al. (2011) the majority of participants were mature students with substantial daytime commitments, including the care of dependent children; and for these reasons, participants tended to enrol via distance learning because of circumstance rather than by design. The primary motivation to study was highly likely to be career-oriented although the chance to have an education as an adult was often motivation itself and associated with developing a greater sense of individual self-worth. However, despite demographic trends among participants, they were not a homogenous audience. Stories revealed that students who appeared to be similar on paper actually led very different lives in reality.

The study observed that only a minority of participants spoke in a consistently positive way about the joy of distance learning. Having enrolled in more-or-less the right number of units (papers) to suit their lifestyle, they never doubted their capacity or desire to study by distance. This group tended to report an active approach to study, which included a depth of interest in learning. From this interest stemmed the qualities reported by Simonson, Schlosser and Orellana (2011) as critical to distance learner success: abstract learning, intrinsic motivation, and possession of an internal locus of control. Furthermore, in agreement with Baxter (2012) this group illustrated how the engagement of distance learners is powerfully influenced by their ability to develop study-related relationships in a digital environment.

In contrast, the majority of participants reported notable periods of despair. They spoke consistently about their semester as a challenge during which they had struggled to balance study with lifestyle limitations. Findings highlighted that students' study choices were not typically realistic in light of their personal circumstances. At the point of enrolment, they had relatively little understanding about the actual demands of studying by distance. Students tended to perceive that distance study could be flexibly scheduled and condensed around the hours they had available after making way for pressing demands in the home environment. A false sense of security seemed to invite this group to ignore non-essential tasks. In other words, they became 'syllabus-bound', which is a phenomenon of passive learners described by Anderson, Lee, Simpson and Stein (2011).

Despair was also linked to those who adopted a 'lone wolf' approach to distance learning. They tended to either have a low awareness of the value that can be gained from engaging with institutional supports or felt overwhelmed by the logistics of sourcing support amid the pressures of everyday life. This point supports the observation of Harnett et al. (2011) that

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online learning is not automatically a positive influence on distance education and that, as Jones et al. (2010) report, participants did not necessarily know how to be effective online learners. Instead, mature-aged participants were highly likely to rely on traditional email correspondence with their teachers, which has previously been reported by Poskitt et al. (2011). Findings suggested that teachers are important role models whose empathetic interactions can shape a welcoming digital culture and nurture a sense of belonging among a community of online learners.

Overall, the inaugural semester was a pivotal period in terms of participant retention, which aligns with the campus-based findings of Krause et al. (2005). A significant period of risk was identified in the second half of semester when the majority of participants began to question their ability to complete their program of study. During this period, students with passive learning approaches were seen to despair with study to an extent that was hard to recover. Eventually, this group either resolved to study fewer units (papers) per semester or concluded that distance learning did not suit either their approach to learning or their lifestyle at that point in time.

Conclusion

The current study has revealed that first-time distance learners experience ebbs and flows of joy and despair; the reasons for which are incredibly complex. Of some concern, despite the sophisticated design of today's virtual classroom, and the new digital tools available to teachers, the most prevalent theme among participants of this study was despair. Given the exponential growth in open and distance education, it is critically important to invest in research that continues to unravel the complexity of distance learner success.

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THE LONELINESS OF THE LONG DISTANCE LEARNER

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Introduction

Laurillard (2008) describes students as individuals 'whose learning journey takes them across the boundaries between school, college, work and university'. Referred to as 'time tracks' by Weigert (1981) these include journeys through parenthood, career, sickness and death emphasising the biological, cognitive and socio-cultural nature of time (Jordan et al., 2008, p.113) that makes the journey complex. This is especially true for working distance learners engaging in courses of study that extend over several years.

The journey they face may be long and laden with mixed emotions that may carry them high or low. In this sense it has parallels with other forms of travel. An airline pilot once described his experience of flying a plane on a long-haul route as hours of monotony and boredom sandwiched between the thrill and excitement of taking off and the joy and relief of landing at the destination. It was the few minutes at the beginning and end of the flight that made the time in between worthwhile. Can the same be said for the experience of distance learners, especially those studying alongside employment, as they make the journey from enrolment to graduation?

There is no doubting the exhilaration experienced by new students when they are accepted for the course of their choice and receive their study materials. Similarly anyone that has attended a graduation ceremony cannot help be impressed by the pride and joy of the student, and of their family, as he or she steps forward to receive their accolade. But does the joy extend to the learning during the period in between? What is it about the student experience that keeps them motivated to continue during the good times and the bad. This is the question addressed by this paper drawing upon survey responses from internationally located working distance learners (McNeill, 2010).

The Working Distance Learner

Working distance learners come from diverse backgrounds in respect of age, gender, ethnicity, location and disability. They come from all sectors of industry and from any region of the world. Although the common feature is their employment, they may be studying for pre-degree, degree or postgraduate qualifications. They may be employed as office support staff, trainee practitioners or qualified professionals and consequently come from all levels of

the organisation, including the most senior. Their work experience may be short or long and their academic experience may be minimal or extensive. They may be working in their country of birth or as an expatriate. In consequence no individual or cohort of students can be considered as typical. What can be anticipated is that working students generally have a strong career development incentive for engaging in study.

This reflects the wider business environment in which the dominant mode of economic operation has shifted from 'reciprocity to exchange' (Gershuny, 2008). Greenwood and Stuart (2006, p.104) describe this flexible economy as characterised by 'uncertainty requiring constant updating and reforming of the skill base' making lifelong learning 'a means of survival' for individuals, companies and economies alike. Alongside this Jordan et al. (2008, p.135) point to the importance attached to Continuing Professional Development for working practitioners to maintain their personal and professional competencies.

Investment in Human Capital

A significant feature of this flexible environment is the choice that an individual has in how they use their time. If this is used to increase their knowledge, skills and enhance experience it is considered as increasing their human capital and potential to improve earnings (Kooreman & Wunderink, 1997, p.180). Continual investment is thus required to keep skills and knowledge at a constant level and, if used to full effect, the time and money spent is considered a worthwhile investment. For the working student their life choices extend in the four dimensions illustrated in Figure 1.

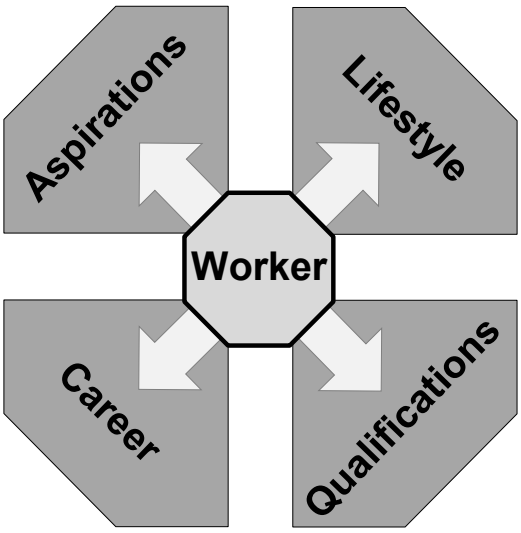

Figure 1. Life Choices of Employees

Each has their own personal aspirations for how they wish to develop as individuals and the role they wish to play within their family and wider society. These may be reflected in the lifestyle that they choose to follow and the visible signals that this sends about who they are. For the majority the ability to exhibit the lifestyle that matches their aspirations is dependent upon their career path. As they advance along this they may discover a ceiling exists that

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constrains their progress. This may partly be due to a lack of breadth and depth in their experience and partly to a deficit in their knowledge and skills. The solution to the former for many individuals is to resolve the latter. Consequently employees with ambition will continually monitor their qualifications and undertake further study as they deem necessary to advance their career, lifestyle and aspirations.

Motivation

Motivation is a key to success in distance learning as it fuels the learning that keeps the student 'machine' functioning. In this respect it draws upon an individual's physical and mental emotions so that stimulation and pleasure can positively motivate whereas anxiety and failure can positively demotivate. Although it can be assumed that a student will be in a constant state of high or low motivation, the reality is that for much of the time they are in a 'neutral' state where they are neither positively nor negatively affected. Incentive is required to change an individual's motivation and this may be due to their particular extrinsic or intrinsic wants or desires. Extrinsic incentives derive from the individual's ability to demonstrate the outward rewards and benefits of their activity. In contrast intrinsic incentives result from the individual's sense of internal satisfaction derived from achieving their internal goals and targets.

Orientations to Learning

The desire, and even the expectancy, for success are strong incentives for working students that influence their perceptions and attitudes toward learning. Reflecting the life choices faced by an individual worker, the four dimensions can be brought together to identify the set of orientations to study (Beaty et al., 1997) shown in Figure 2.

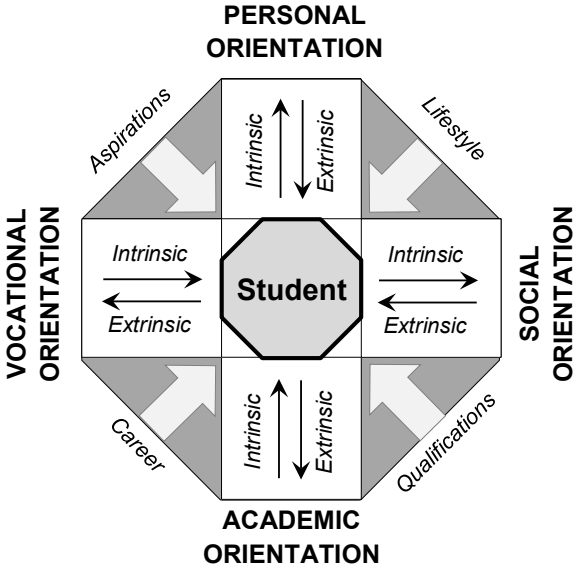

Figure 2. Orientations to Study of Working Students

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Vocational Orientation

Intrinsically the incentive is for education or training and working students are motivated by the relevance of the course of study to developing their personal knowledge and skills so advancing their future career. Extrinsically the goal is to obtain a qualification and students are motivated by the recognition displayed by the qualification's worth in terms of the effort and difficulty that they invest.

Personal Orientation

The desire intrinsically is for a broadening experience or self-improvement and a student's motivation is to tackle challenging, interesting study materials. Extrinsically the need may be to compensate for past lack of achievement or to prove current capability. Students are motivated by receiving positive feedback and by passing the course.

Academic Orientation

The intrinsic aim is to engage in subject matter that is of intellectual interest. Consequently students are motivated to choose stimulating and engaging components of study. From an extrinsic perspective the target is to advance educationally so students are motivated by good grades and continuous academic progression.

Social Orientation

The intrinsic wish is to be accepted as a member of a learning community. Students are motivated by the tacit encouragement and support from those within their milieu, and this may extend beyond the academic community. Extrinsically the preference is for a shared experience and students are motivated by social activities and networking opportunities that build their confidence.

The orientation adopted by a student can be for extrinsic or intrinsic reasons (or both); and one or all orientations may act as their driver for learning.

The Motivation Challenge

The challenge that faces distance providers is ensuring that their students are offered study that matches their needs, abilities and interests. Keller's (1983) ARCS model of motivation promotes a design strategy that addresses four related components: arousing the student's interest, emphasising relevance for the studies, developing an expectancy of success, and producing satisfaction through offering intrinsic or extrinsic rewards.

These are important if a student's ultimate desire to self-actualise and fulfil their individual potential is to be realised. In doing so the degree of the learning achieved is greatly dependent upon the strength of their particular orientation(s) and the respective incentives. As a general rule individuals prefer tasks of moderate difficulty as this avoids failure but for many working

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students their need to achieve forces them toward attaining better marks on courses they perceive as difficult but highly relevant to their career goals.

This can have both favourable and adverse effects. High marks and feedback that is objective and constructive will positively motivate whereas low marks and unsubstantiated critical comments will have the opposite effect. With the former the student's self-confidence and drive increases but the latter may result in the student succumbing to perceived insurmountable pressures and either adopt a coping strategy to get by, or giving up and dropping out completely.

Motivation and Conflicting Demands

Working students do not dispute the fact that they need to invest time in vocational training but they do experience conflict and pressures within other areas of their lives such as family and employment (Holm, 2007). To alleviate this Smith (2003) suggests that students expect to exercise 'client control' over the flexible delivery of content, time, pace and place of learning. This is characteristic of 'individualisation' which Landwerlin (2006, p.170) describes as a person's 'increasing freedom to construct their own life projects' as a result of a reduction in social control over their lives; effectively the freedom to make their own choices.

Nonetheless in the case of adult learners the potential for motivation may be constrained by factors such as workplace flexibility, geographical location, gender, structure of the family unit and whether children are involved (Goodin et al., 2008, pp.261-262). Brannen (2005) observes that individualism and work intensification increases the complexity of life as individuals are driven to achieve more at work, thus interfering with social activity and study opportunity. In respect of the study itself, problems can develop if the background experience and knowledge of students is overestimated, and this may be compounded for an international student if the language of instruction is their second language.

From a motivational point of view it is hard to raise enthusiasm if the novelty of learning has worn off. In the intrinsic sense motivation will not be sustained if the student sees a lack of relevance between what is being taught and his or her goals, needs or desires. Extrinsically it is unlikely that motivation will be high if the student has engaged in education due to some external pressure, such as from an employer, rather than from their own choice.

Motivation and the Career Imperative

Contemporary society is more organised and distanced from everyday life and this suggests individuals are less constrained by the demands of organisation such as having to physically attend for work or lectures. They have, according to Jarvis (2004, p.223), become 'free to follow their own pursuits at their own time and in their own way so have become self-determining individuals'.

This freedom may account for why as much as 50 % of all students who start a distance learning course drop out before completing it. In the case of vocational courses this rate

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reduces and this can be ascribed to the self-development imperative. Developing their human capital provides powerful motivation for working distance learners to maintain their engagement. This continues even if study results in failure or deferral as shown by reclamation rates as high as 75 % (McNeill, 2007). Work is their priority activity and presents the severest constraint on their study activity, however, this is not consistent as the self-employed and full-time private sector employees often have greater flexibility when contrasted with part-time employees and those working in the public sector.

Recognition of the individuality and autonomy of the working student is important. Prior knowledge is a critical factor for accelerating vocational studies and working students generally exhibit a pragmatic approach to learning and will do what is necessary to complete their course. In terms of motivation and engagement it is clear that the extrinsic link between study and a qualification that offers both career and financial reward is their over-riding incentive. In this regard, working students may not be typical of those distance learners who may study intrinsically for pleasure or personal satisfaction but they can be regarded as representative of the wider body of working adults.

Motivation and Autonomy

The perceived disposition in contemporary life for 'accentuating the uniqueness of individuals' (Øian, 2004) can be considered as characterising the shift towards individualism. In many respects this is not a new concept within distance education as Woodley and Ashby (1994) and Rowntree (1997, p.47) observe that mature students rarely form a homogeneous group and vary in their motivation, educational background and personal circumstances.

Nor is the autonomy that self-determination offers new within adult education. McVay Lynch (2002, p.34) highlights that adult students bring a rich reservoir of knowledge and experience to their learning and expect to be treated as mature, thinking individuals who accept responsibility for their own learning. Respecting the individual and their personal goals creates a firm base for building motivation and is reflected in Moore's (1972) argument for learner autonomy. He defines this as 'the extent to which … it is the learner rather than the teacher who determines the goals, the learning experiences, and the evaluation decisions of the learning programme'.

Motivation and Experience

To an extent the ability to act autonomously increases with an individual's age and experience of work and life. This is particularly applicable to many working students (Peters, 1998, p.13) and alters their pedagogic starting position in comparison with traditional university students. In their case, working students exhibit strong extrinsic motivation to complete their studies as both career progression and enhanced financial income hinge on the qualifications they achieve. Many return to study after breaks in education and McGivney (2003) notes that individuals who make sacrifices by delaying their studies often have something to prove and display increased motivation. It is noticeable, as Barnett (2007, p.15) observes, that the 'will' to

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complete a course is a strong incentive, however, the problem is that 'understanding the broad nature of the commitment is one thing but sustaining it each day for a long period is another' (Evans, 1994, p.106).

The potential to lose motivation over time is high and the extent of a student's prior knowledge can make a difference. Although directed at classroom education Carroll's (1963) Model of School Learning focused on the economics of the learning process. He hypothesised that the degree of learning is a function of the time actually spent in learning divided by the time needed for learning. In his equation the time spent in learning is the smaller of aptitude, opportunity or perseverance; and the time needed is that remaining after adjustment for quality of instruction and ability to understand instruction. If underachievement occurs this is attributed to a combination of lack of perseverance, poor quality of instruction, or insufficient time allowance.

Applying this to working students, aptitude recognises that many need only a small amount of effort to learn due to their seniority, work experience or prior learning. This can be anticipated to develop the higher levels of confidence and motivation necessary to maintain the required perseverance. The pitfall is that, in common with other students, they may lack the opportunity to learn due to an excess of study material and/or their other commitments. The caution is that the motivation of experienced working students cannot be presumed as it can as quickly be lost as gained.

Motivation and the Sword of Damocles

It is clear that the strong career and work orientation of working students keeps them focused on achieving the educational gain required. For these students, particularly ones taking further study to develop or advance their career, the possibility that they may lose their job hangs over them like the sword of Damocles, and this becomes ever more likely in times of economic recession. Fear of redundancy and increased workloads understandably keep students at work for longer but this ultimately constrains their opportunity for study. Younger students in particular tend to work longer hours as do international students.

The fear of losing their job is cited by Kodz et al. (2002) as a primary factor that prevents employees taking up more flexible working arrangements; and long working hours and high work intensity are the top concerns most frequently cited by employees (CIPD, 2009). Under these circumstances it is understandable that maintaining motivation for study is difficult if the main incentive is to remain in employment.

Motivation Overcomes Adversity

Career development is the over-riding factor for working students that boosts their intrinsic motivation to complete their studies; and it is their perseverance in the face of adversity that is their singular characteristic. This is best illustrated by the following quote from a working student. It illustrates that the life events around which a working distance learner must

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negotiate study can be extreme, but that in spite of this they can go on to pass their course as this student did.

> *"My boyfriend had to deal with false allegations ending up in court, his divorce isn't exactly an easy and peaceful one, he has just lost his job and as a consequence suffers from various stress related illnesses. I moved and refurbished my flat during the autumn, started a new job, my mum's terminally ill and my family is in another country, so remotely demanding my attention and mental/financial support as well as my visits 4 times a year. I also have a stress related illness which prevents me from doing sports, so recreation in this environment is "slightly" difficult. These are of course my private problems, and I try to do my best to study and don't fall behind too much. It's not easy." Female student, age 28.7, working in UK*

Conclusion

The title of this paper is adapted from the 1962 film, *The Loneliness of the Long Distance Runner*, in which a young man from a deprived socio-economic background commits a crime and is placed in detention. Despite his circumstances he rises in status due to his prowess as a long distance runner and is selected to enter a race against more privileged runners. The film ends with him on the point of easily winning the race but stopping before the finish line as memories of his past and thoughts of his future present a picture of desolation. The message is that an individual's self-esteem can be built up but just as quickly can be destroyed, often by factors outside their control.

The student quoted above could just as easily have stopped due to the immense pressures she experienced. The fact that she did not demonstrates the extraordinary resilience and determination of the motivated student. This can be attributed to individualistic single-mindedness but is as likely to be for sound financial and career advancement reasons. In this respect although the demands placed on them may reduce their opportunity to study it is clear that, for the majority of working distance learners, their vocational orientation and both extrinsic and intrinsic motivation prevents them from losing the race.

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MOTIVATION, COLLABORATION AND QUALITY MANAGEMENT OF MODULES OF A GERMAN CAREER SERVICE

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Abstract

How does one motivate busy university students to attend optional courses for which no credits are obtained? How is participation and collaboration achieved amongst the course participants and how are these courses evaluated to ensure consistently high quality and continued adaptation to changing needs? The consideration of multiple intelligences, relevance of the content and adjustment to the prospective participants' time resources are three key factors to bear in mind for motivation purposes. The relevance issue was tackled through the conduct of surveys with the immediate benefactors of the course visit, the students on the one hand and companies as future employers of these very students on the other, to identify urgently required competencies that are not easily obtained through regular course work. Based thereon was the decision for the development of four different semester-long courses in terms of foci, content, delivery methodologies and evaluation and assessment methods. A blended-learning approach has been proven ideal, where extensive e-learning components are accompanied by or interspersed with onsite workshops for competency testing and application.

Project results in their conclusive phase – overview

The Job Factory – Career Service at West Saxon University of Applied Sciences, Zwickau, Saxony, Germany was launched in fall 2009 as part of the project of the Saxony-wide introduction of career services at institutions of higher education. The project is funded by the European Union, the European Social Fund and the Free State of Saxony and aims at providing services to students that facilitate the transition from study to work and enhance students' job perspectives and job performance in companies of the region.

One of these services of the Job Factory – Career Service is the delivery of semester-long courses, so-called modules, that present students with the opportunity to gain knowledge and experience in areas that are not or hardly covered during their core courses but are crucial for a successful and swift transition to employment. The areas covered in these modules were decided upon based on three comprehensive surveys conducted with a large part of the entire student body, companies present in the region and university professors. The results pointed

to a clear-cut preference for technical skills on the one hand including Microsoft Office and project management and soft skills on the other. Further analysis of the latter preference revealed the need for separation of soft skills into two modules: leadership skills and a separate module on the remaining soft skills.

As these courses are add-ons[1] to the core studies, they have been largely set up as online courses except for some on-site workshops in areas that require interaction and where interaction boosts the learning outcome. The e-learning character allows for greatest flexibility for students to include these modules into the overall term structure without sacrificing any other core requirement. To allow for best possible interaction with other module participants and with the mentor, latest communication and data collection tools have been included. Motivation to pursue any of the modules is solely based on the perceived relevance and need to know with regards to the contents provided, as credits cannot be obtained[2].

Quality checks are continuously conducted through the module participants themselves and through external evaluators to ensure firstly that the contents and delivery methods are meaningful and conducive to meet the learners' expectations and the intended outcome and secondly that the course administration is streamlined with the university processes and omits any unnecessarily complicated procedures.

The modules have been gradually introduced at the university since fall 2010 and have all been tested, adjusted and fully implemented as solid components of the Job Factory – Career Service. Following will be a detailed elaboration as to:

- how learners are engaged and challenged to take ownership of their learning process;
- how the learning experience is constructed and enhanced;
- what collaboration patterns are utilized;
- what specific methods are utilized to achieve comprehensive quality management.

Engaging and challenging learners

To meaningfully engage learners in the learning process, extrinsic motivation is required amongst other pull-factors. Motivation in general is an incentive or reason to produce a specific human behaviour. For effective knowledge transfer, extrinsic student motivation is an essential prerequisite and can be created through characteristics of the learning process such as recognition, active participation, a wide variety of learning tools, contents and teaching methods as well as the possibility to interact (Schumann, Tittmann, Rühling et al., 2011). Yet another important aspect is the perceived relevance of the content.

To identify core traits that make job seekers stand out from the crowd, the team of the Job Factory – Career Service had many discussions with employers of the region and conducted a survey with companies. The result clearly pointed to the fact that internships, strong technical skills and overseas experience seem to no longer suffice as many students have mustered two of these or all three once they leave university. What however sets one apart from the crowd are well-developed and honed soft skills and technical skills such as project management or

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the excellent capability to work with the Microsoft Office suite. Therefore, the Job Factory – Career Service offers the four following modules to help students increase their chances on the job market:

- Project Management;
- Microsoft Office;
- Soft Skills;
- Leadership Skills.

These semester-long courses can be pursued in addition to a student's regular course load on a voluntary basis. Through attending any or all of these modules, students establish a solid foundation to build on in terms of independent and responsible take-charge behaviour in addition to crucial skills that will facilitate the transfer from study to job and the successful climb up the career ladder (Schumann, Tittmann & Granow, 2009).

On successful completion of any of the four modules, the students receive a certificate from the Job Factory – Career Service that confirms participation. Two of the modules, Project Management and Microsoft Office, offer the additional possibility to obtain an accredited certificate, the "Basiszertifikat im Projektmanagement (GPM)", an officially recognized Foundation Certificate in Project Management and a Microsoft Office Specialist certificate respectively. These additional certificates serve as relevance boosters and, according to Herzberg's motivation theory (Herzberg et al., 1967), as motivators with regard to attending the modules. These and many other motivators such as flexible time management and improved opportunities of future career development further add to the participants' motivation. The absence of such motivators does not necessarily cause dissatisfaction. If so-called hygiene factors such as working conditions and influence on one's private life (Mosena & Winter, 2013) are perceived as positive by the course participants, the learning process can still be considered satisfactory. The theoretical course content, provided by the Job Factory – Career Service, is always available online and hence the participants can work on the content at their own pace, time preference and location so that the influence on their private life is minimal. The personal responsibility for the learning process and progress is directly linked to each individual learner's effort. To conclude, through the careful avoidance of related negative hygiene factors combined with positive motivators, the course conditions are well set to generate and maintain extrinsic motivation of its participants.

The concept of multiple intelligences (Ebenhöh, 2008), which identifies different preferences and abilities to achieve the retention of newly acquired knowledge, is another consideration that has driven the choice of delivery tools in the e-learning environment of the modules. Hence, to deliver knowledge, an "interpersonal" component is important. This can come in form of a capable coach and/or communication tools that allow for collaboration. The fact that a considerable part of the knowledge is presented in text from and that learners are required to take written tests satisfies the need for a "linguistic intelligence", i.e. a form of knowledge retention through the mere use of the language through reading and / or writing. Further, both a "musical" as well as a "logical-mathematical intelligence" are required. The

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"musical intelligence" is employed when learners retain knowledge preferably by listening to the information. This is achieved through inbuilt audio tutorials in the e-learning environment. The "mathematical-logical intelligence" is drawn on when learners learn best by mulling over the materials to draw conclusions to develop a certain competency. This again is achieved through the provision of case studies and accompanied tasks. Finally, expressive images and charts are included to satisfy the need for the "spatial" learning preference. The online nature of the modules as such suits the "intrapersonal" learning style. In addition to the e-learning components, three of the four modules comprise of an interaction-based face-to-face workshop component as well, which offers the opportunity to expand upon the already acquired knowledge, test, deepen and strengthen it and in the process develop the respective competencies (Rühling et al., 2010).

Participation and collaboration

The delivery of pure knowledge can easily be achieved through the provision of contents online, in other words through e-learning. To acquire key competences however, personal contact and interaction through group work is considered fundamental, which can be achieved through onsite workshops and case studies (Schumann, Marr, Weber et al., 2012). The experience of the Job Factory – Career Service from the past three years of conducting the modules has led to the conclusion that in particular the teaching of social and leadership skills, such as time management, conflict resolution, coaching and negotiation skills etc. benefits greatly from the combination of e-learning with onsite collaborative events (see Figure 1). Despite the far-reaching possibilities of virtual communication and e-learning methodology, the benefit that arises from onsite collaboration cannot be matched. While the content provided in the e-learning phases sets the theoretical foundation of knowledge and the methods described, application and practice happen best through personal interaction with other participants of the course.

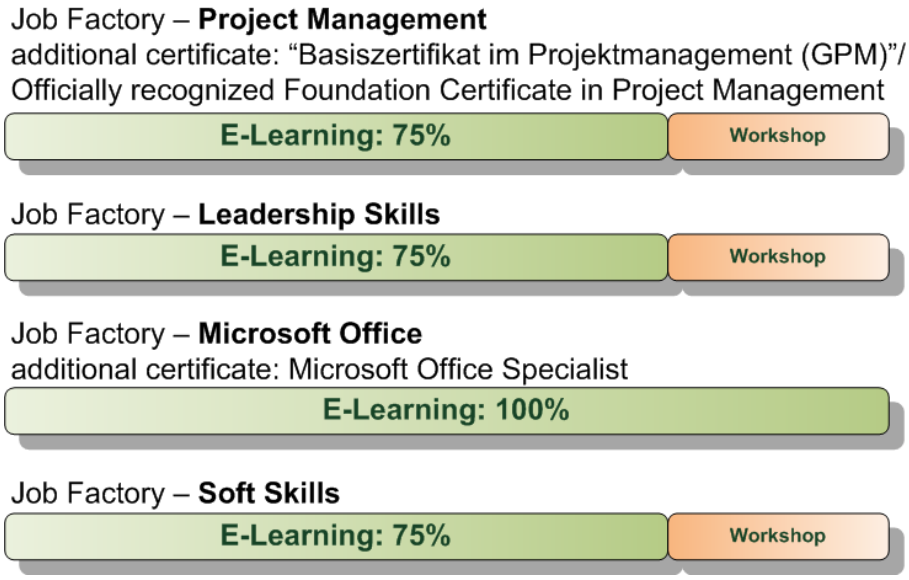

Figure 1. Ratio of E-Learning vs. Onsite Workshops of the four Modules

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Three of the four modules, Soft Skills, Leadership Skills and Project Management, make use of such a blended learning approach and employ both, e-learning and workshops / onsite group work. The e-learning comprises of 75 % of the total content and interactive workshops fill the remainder of 25 %. The workshops of the modules Soft Skills and Leadership Skills are conducted in training fashion with extensive group work and under the guidance of an experienced coach. This way, the participants receive instant feedback for their contributions both orally through their teammates and the coach as well as through the behaviour their very contributions provoke while newly acquired knowledge is tested and put to practice. During the workshop for the module Project Management, the theoretical foundation is built upon through additional input and the acquired knowledge is applied in case studies whereby again the objective of competency development is reached (Schumann, Gerischer, Feng & Zhu, 2012). In conclusion, the workshops are to enhance the theoretical concepts that the participants acquire in the e-learning components by creating opportunities in which the knowledge is applied and tested in relevant practical situations. Through the group feedback, new competences are developed.

An exception to the described blended learning concept is the Microsoft Office module that relies exclusively on e-learning without specific workshop periods. Through the integration of tutorials and due to the nature of the content's application, i.e. being computer based, there is currently no need to add any group exercises. Interaction with the Job Factory – Career Service team or other participants is however easily possible through the inbuilt forum, through email or directly by visiting the team. This ensures that problems can be solved swiftly and questions can be answered just as fast. This type of interaction is also possible for all other modules.

Furthermore, this training method is increasingly offered as complementary occupational training in corporations. If university students familiarize themselves with e-learning already, they will have no inhibition to utilize similar opportunities for their professional development later on, which facilitates their lifelong learning (Schumann, Kassel, Tittmann et al., 2012).

Specific online-based group work may however be added to the current Microsoft Office module to enhance the online interaction in a meaningful and relevant manner. This assumption is based on the trend to outsource common documents to external servers (clouds) so that they can be utilized and modified by each member of the team and from any location.

Current experience has shown that particular forms of virtual group work meet with a very low level of acceptance among the participants for the following reasons: technical difficulties for example during conference calls and lacking motivation to conduct discussions through this medium. The latter problem is reinforced if the course participants have the opportunity to physically meet due to spatial proximity, which is the case with the students of the university. If this opportunity is lacking, online collaboration is very meaningful for example to tackle group projects. Collaboration could involve online chats to discuss topics and edit documents. Here, too, the trend of cloud computing opens up new possibilities, for example,

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to collaborate on specific documents. Hence new forms of e-learning to collaborate on projects could be introduced. An additional current obstacle to online collaboration can be traced back to Moodle, the system that Job Factory – Career Service is currently using to deliver the e-learning components of the modules. Moodle works like a social network. However, as the participants are already using other social networks such as Facebook, in which they are present, often for extensive periods of time, the motivation to be online and present in an additional social network for again longer periods of time is very limited. Hence, to facilitate navigation, communication and to increase motivation to learn and pursue the modules, a stronger link with popular social networks that users are already using in their spare time could be meaningful.

Quality Management

High quality of all components of the process has been a prerogative from the moment the idea was born to establish such training modules by the Job Factory – Career Service. Hence, experts were carefully selected and scientific methods were employed to best master every single one of the following steps that have been necessary to achieve the current project results:

- Development and conduct of surveys with students, professors and companies.
- Analysis of surveys and conceptualization of the module service as e-learning / blended learning courses.
- Development of the module structures.
- Development of the teaching materials that feed the module shells.
- Delivery of the module content both in e-learning and face-to-face workshop terms.
- Evaluation of the modules.

The comprehensive survey that was carefully constructed based on sound empirical research principles, was conducted with more than 200 students, amongst them representatives from all schools of the university. It returned conclusive feedback as to the needs and preferences of optional learning contents. A similar procedure was employed to obtain feedback from professors of the university as to beneficial complementary training contents for students. The survey conducted with industry representatives from the region identified the needs from the employers' perspective, i.e. which behavioural traits, technical skills or complementary knowledge does the employer ideally expect from new employees with an academic background. As pinpointed earlier already, an analysis of the results of all three surveys concluded that the four topics Project Management, Microsoft Office, Soft Skills, Leadership Skills proved to be priorities and hence became core content of the four modules that were developed thereafter.

The structure of the modules was established under the guidance of experts. Experienced professionals from the respective areas supported the development of a meaningful content structure and education professionals with insight into teaching methodology supported the decision making process as to methodological structure and set-up as well as to the ratio of e-

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learning and workshop components within each workshop. All with the goal to combine proven techniques to a learning experience that fully meets the key requirements: motivating and challenging learners to take ownership of the learning process and at the same time provide a largely flexible learning environment to eventually develop and hone core competencies.

The teaching material contents were developed from experienced professionals in the field who then also largely supported the content delivery in the onsite workshops. For the two modules Soft Skills and Leadership Skills, a professional with a proven track record in conducting corporate trainings in both areas functions as coach. A certified project manager teaches the workshop of Project Management. For guidance during the e-learning process, professors of the respective area can be contacted through the various inbuilt communication tools discussed earlier. Microsoft Office as fully e-learning based module is supported by an IT professional who was a core contributor to the set-up of a Microsoft Test Centre at the University.

To close the circle, independent evaluators were appointed to assess each module from all ankles:

- efficiency of the administrative processes pertaining to registration and certification;
- marketing and promotion methods to inform prospective participants of the events;
- teachers, teaching methodology and suitability and depth of the contents.

The resulting assessment reports identify strengths as well as opportunities for improvement. The module participants themselves provide feedback as well in form of feedback forms that are handed out at the end of the entire module to identify what learners liked and disliked. Based on these two independent forms of feedback, the modules are regularly improved and updated.

Conclusion

Experience has shown that the decision to base the four modules of the Job Factory – Career Service on the e-learning format has been a wise one. This way, two crucial factors that influence a student's decision to pursue a module or not, time and location, way positively. Module work can be done at any time and from any location. Additionally, the mere fact that students have to take full responsibility for the learning process and hence also its progress, supports the development of key social competencies such as time management, decision making, setting priorities as far as contents to work on is concerned etc. The various learning preferences and styles that are summarized by the concept of Multiple Intelligences have further influenced the set-up of the learning environment and let to the development of contents that offer a wide variety of forms of input and teaching methodology.

Challenging has been the fact that some competencies are difficult to be mastered if delivered solely online. For example languages or various social skills are best tested and honed in direct

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personal interaction. Therefore, three of the four workshops, Project Management, Soft and Leadership Skills, comprise a 25 % workshop-based component besides the e-learning part. Only the Microsoft Office Module is fully based on e-learning due to the fact that the acquired skills are best to be tested and strengthened on the computer.

A challenge for the further adjustment and development of the modules remains the addition of an extended element of fun as this would undoubtedly add to the motivation to attend a module. At the moment, fun and humour remain largely restricted to the onsite workshops, where games and role-plays as well as the mere contributions by the participants while they test their newly acquired knowledge and skills cause amusement and laughter, which however are surely as valid to the development of competencies as are serious discussions and investigations.

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[1] The project requirements prescribe that all contents provided by services of the Job Factory – Career Service are to be additional to any skills and knowledge that students gain from their core courses of major(s) and minor(s).
[2] The project requirements prescribe that no credits are to be obtained through services by the Job Factory – Career Service due to its supplementing function.

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UNIVERSITY STUDENTS' USES OF ICT: THEIR PERSPECTIVE

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Introduction

This paper that we are presenting forms part of a research and development project conducted by EMA, a research group of University of Barcelona. The aim of the project is to identify and comprise the uses of the ICT related with processes of learning of the university students, with the intention to extract conclusions that allow to improve the design of the situations of learning in formal context, doing them more adapted and interesting, related with different profiles of students.

In this proposal, the study of the use of the ICT in the processes of learning of the students is presented in a transversal and integral sense that incorporates the didactical dimension, the personal dimension and the social dimension. That means to find a space of intersection between all them. It is referred to the uses proposed in the academic activities posed by the teacher in each subject, and to other uses that the students realize by proper initiative, that can have a relation more or least direct with the academic tasks, but that involve in any case, processes of learning. Likewise, the design of the situations of learning are contemplated in this more global dimension, including activities of learning, learning environments, tools and resources, teacher role, etc.

Objectives and theoretical Framework

Objectives

The aim of the project is to identify and comprise the uses of the ICT related with processes of learning of the university students, with the intention to extract conclusions that allow to improve the design of the situations of learning in formal contexts, doing them more adapted and interesting, related with different profiles of students.

Specially, the aims of the investigation are:

- Analyze the uses of the ICT that realize university students in relation with processes of learning.
- Characterize the type of use, the preferences and the attitudes to the ICT developed by university students in situations of learning.

- Observe the relation between ICT used, fields of learning, actions/tasks developed and different variable (age, typology of education, sex, academical field, academical results).
- Elaborate a catalogue of best practices of learning with ICT, useful for teachers to understanding the processes of university learning taken part by technologies, that oriente the design of situations of education and learning in formal contexts.

Theoretical framework

In this proposal, the study of the use of the ICT in the processes of learning is presented in a transversal and integral sense that incorporates the didactical dimension, the personal dimension and the social dimension. That means that our objectives arise of the long life learning theoretical framework. In planning and structuring learning experiences mediated by technology must take into consideration the interrelationship between three basic elements (Garrison et al, 2001, 2005, 2006): cognitive (construction meaning by means of continuous reflective process within a research community), social (ability to connect with members of the community of learners on a personal level) and didactic (structure and support to the educational process). At the intersection of these three elements creates a stimulating context that facilitates critical discourse and reflection for the construction of meaning and makes sense to a community with educational goals.

Moreover we have been taking in account the theoretical framework related with the process of identity construction of students by means of ICT in relation to the learning process. Our society is taking part of a revolution that has determined changes in the ways that young people adopt the forms of cultural production and consumption, relating, communicate and learn as shown by several studies (Turkle, 1995; Postman, 1991, Lankshear and Knobel, 2008; Solé, 2007). Since youth were called Digital natives (Prensky, 2001), as well as, Google generation (Oblinger, 2005), Digital generation (Tapscop, 1998), and Instant generation (Lenhart, Rainie, & Lewis 2001), it was assumed that the technological experiences and uses of students were homogenous for their process of learning. Some teachers and experts have worked with the idea that university students had a sophisticated knowledge and understanding of ICTs. However, some recent studies (Kennedy, 2009; European Commission, 2007; University College London, 2008) call into question the widespread topic of the domain of technology by young people, and they finds a use of recreational and social network and lack more skills for academic purposes.

Finally, the third thematic area that this project is related is the role of ICT in the achievement of academic and professional skills. Communities and virtual environments have great potential as a ways for learning and professional development. However, the setting up of virtual communities is not something spontaneous that occurs by simply having Internet access. Training is required. Studies on the uses of the Internet in the university system of Catalonia (Duart et al., 2008) note the distinction between the uses of the network inside and outside the classroom. Outside the classroom, both teachers and students are recognized as experts and regular users of the network communication purposes, social relations and

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finding information, while the same agents recognize and use much more restrictive in the context of traditional universities.

Methodology

This project adopted a combination of quantitative and qualitative methods and is raised through an interpretative paradigm. In the first stage we used a quantitative research, specifically a questionnaire that was used as a data collection method with close-ended questions. To check the validity were obtained feedback from a pilot test and experts in the field, who examined the questionnaire.

The sample of this study was 1048 students (error 5 %, 95.5 % confidence interval) enrolled during the 2010-2011 academic year in the first and fourth courses of their universities. It has been applied to a five different universities of Catalonia. We selected the students from several criteria:

- Personal variables: age, gender, socioeconomic status, education, ICT equipment, frequency of Internet connection.
- University.
- ICT use in the classroom: type, frequency of use and perceived usefulness.
- ICT use by students to perform academic tasks: type, frequency of use, degree of competence, perceptions and evaluations.
- ICT use by students, not specifically on academic tasks: type, frequency of use and degree of competition.

On the second stage, we were working with different focus groups discussion. One the one hand we randomly took some students who had been taken part of the previous questionnaire, and we distribute them in three heterogeneous groups. For that reason we take in account their personal and study variables. On the other hand, in order to contrast this information we develop another focus discussion group, but this time preformed by a group of experts. They were eight teachers, selected form several criteria: University where they work, high use of ICT in the classroom and the type of subject they were teaching.

Expected outcomes/results

The first part of the project, with the quantitative method, allowed us to observe that there is heterogeneity in relation of how students use the technology to learn. In this stage we concluded that there are a variety of uses of technologies and most of them are not transferred for learning, although they perceive themselves as a high skilled to use ICT. Therefore it is expected that university students held a fairly positive view of the different advantages that ICT can bring to informal learning and respect to formal learning purposes the students could express a preference for the traditional education methods because they are not use to develop these ITC skills in the university.

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Furthermore, we have had many results in this stage. On the one hand, we can see which tools are using our students in the formal context, that means which tools teachers proposed in their subjects and students use. Internet searches (95.8 %) and Moodle (91.2 %) are the most used tools. However Webquests (4.5 %) and SecondLife (1.4 %) are the less used tools.

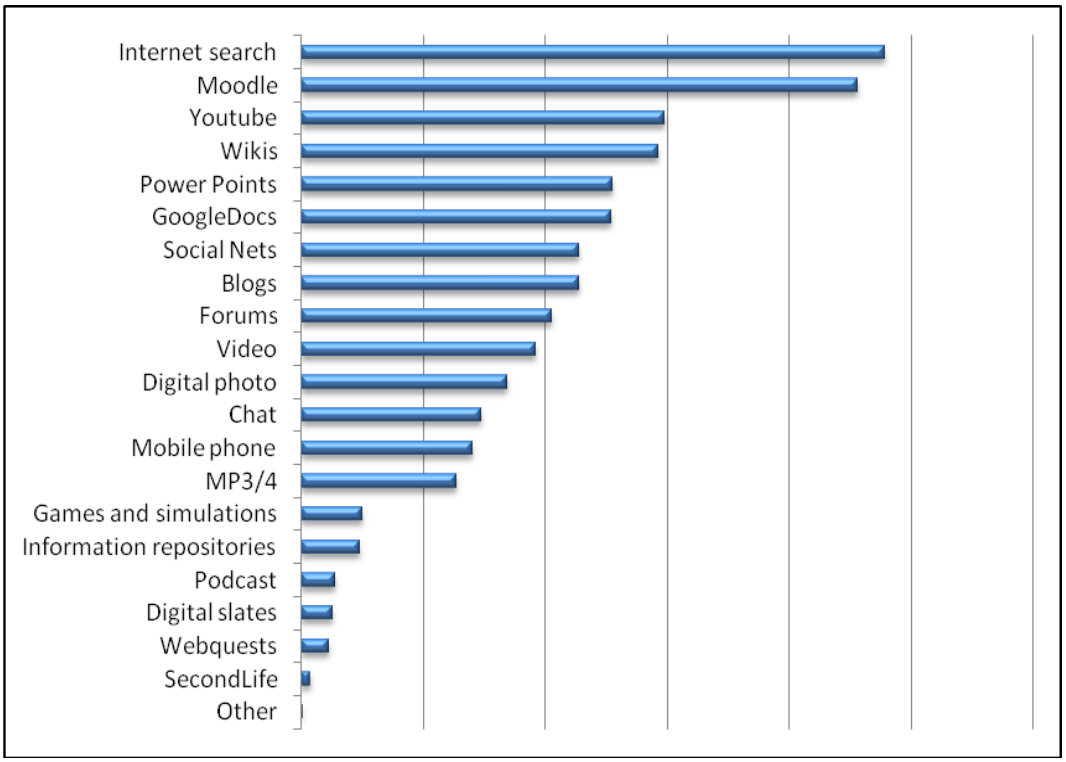

Figure 1. The use of the tools in the formal context

The student's opinion about the usefulness of these tools is quite similar to its use. They highly appreciate the tools that are most used, but we should emphasized that Google Docs, wikis and Webquest are appreciate for their learning and teachers don't used it too.

On the other hand we have to focus in the differences between the students. Firstly students have a different frequency and use of ICT if they are women or men. In informal contexts, women use more tools related with social networks for communicate and men use with more frequency games. Also there are different between students that take a science or technical degree and students that study a social or humanistic degree. The first one uses more ICT in their lives (formal and informal context), while the other students use less tools and with less frequency.

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Table 1: Differences between science/technical students and social/humanistic students

Use of mobile phone		**Social /humanistic**	**Science/technical**
Video calls	P=0.000	37 %	62 %
Games	P=0.000	56 %	76 %
Email	P=0.000	56 %	76 %
Internet access	P=0.000	58 %	77 %
Organizer	P=0.000	65 %	79 %
MP3	P=0.000	70 %	83 %
Send photos	P=0.028	67 %	74 %
No significant correlation			
Send SMS	P=0.871		
Call	P=0.939		
Take pictures	P=0.090		

At the time of writing this paper, the second stage of our project is in process, we are developing the analysis and conclusions of the focus groups discussions. However preliminary results of second stage show us that ICTs are used for teachers as a logistic tool rather than a tool that influences in the cognitive dimension of learning. Furthermore, students said that classrooms are not prepared as learning spaces for use ICTs, and they mark out some tools as a useful ones, like Google Docs, that are not used by the teacher.

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TALENTCAMPUS: NOVEL APPROACHES AND ENVIRONMENTS TO HELP LEARNERS REVEAL, DEVELOP AND CAPITALISE THEIR TALENT

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Introduction

European education and training policy clearly states that "In the future, creativity, the ability to think laterally, adaptability and other 'transversal' skills will be valued more than the specific bodies of knowledge that schools have traditionally taught." (European Commission, 2013). While this has been a priority at school level education for some time, it is no less important for higher education in a world where academic knowledge is no longer the only reference when it comes to apprehending excellence. In order to face the challenges of the 21st century, a change in mindset is needed with respect to relations between the socio-economic community and higher education. When academic knowledge is included in daily work activity, and given the complexity of questions addressed, the workplace can generate many other kinds of knowledge. These are clearly identified in continuous education but less so in initial higher education, at least in France. In order deal with an unpredictable and ever-changing changing world, higher education needs to create new ways of improving informal knowledge, enabling people to face new situations and even to create them. This is now becoming a reality through a number of initiatives.

One such initiative is that of TalentCampus, which aims to develop a truly innovative approach to training for talents from all walks of life. If we take talent to mean 'a capacity for achievement or success' rather than the long-accepted definition of 'a natural ability', then it is in the detection, revelation, development and capitalisation of talent in the form of social competences and soft skills that we can aspire to improve capacity for employability, entrepreneurship, creativity and innovation.

This paper begins with an introduction to the TalentCampus programme. We shall then present the results of the evaluation of the first TalentCampus Summer School in July 2012 before exploring avenues for future development in terms of the contribution digital and social media can bring. At the time of writing, the TalentCampus Winter School (February 18th-22nd) has not yet taken place, however the evaluation results of this event will also be

available for integration in the presentation to be given at the EDEN Annual Conference in Oslo in June 2013, should this paper be accepted.

Background

TalentCampus is a programme supported by the PRES Bourgogne Franche-Comté and its Foundation for Scientific Cooperation. Accredited by the French Ministry of Research and High Education within the Investments for Future Programmes, TalentCampus obtained a financial support of 5.3 Million Euros for 8 years and was certified within the 5 first innovative projects for education in France in 2012.

The PRES Bourgogne Franche-Comté was founded by decree on December 15th 2010 as a Foundation for Scientific Cooperation gathering all players from Bourgogne and Franche-Comté: universities, engineering schools, teaching hospitals and healthcare centres, national research centres (CNRS, INSERM), business concerns and regional or local authorities. The aim of this Foundation is to federate academics and private companies in order to elaborate development strategies for the two territories within the next 20 years. Research and developments, creation of spin-off, innovation, and pedagogy are the heart of the Foundation for Scientific Cooperation. The PRES Bourgogne Franche-Comté counts 54,000 students including 7000 Master students, 6000 engineering students, 2200 doctoral candidates, 69 research teams, 800 education and training programmes, 3500 instructors and research professors and 2200 administrative and technical staff.

Proposed in the format of Summer, Winter and Spring schools, TalentCampus aims to develop competences complementary to academic ability such as leadership, behaviour in society, emotional intelligence, stress management and so forth. One of the key principles driving the programme is that of promoting "excellence through difference". Social, age and disciplinary diversities are thus key factors in the success of TalentCampus training events, with teenagers from high school, students (undergraduate, postgraduate, PhD), employees (juniors and seniors), and unemployed people making up the learner population.

TalentCampus and the joy of learning

Looking deeper into our understanding of what is talent (Mirallès, 2007; Foucher, 2010), we can say that it is a combination of shared excellence in a particular field and of difference (the original and unique personality of an individual). Possessing talent does not necessarily imply being top of the class or an overachiever. Talent involves a particular ability, combined with specific resources and a distinctive style, applied to a given activity and often performed with pleasure in a remarkable way. The notion of pleasure is not to be neglected: as we speak of the joy of learning, so may we speak of the joy of discovering ones talent, developing it, expressing it and putting it into practice.

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TalentCampus courses are designed for a group of 20 to 30 learners from very diverse backgrounds: high school students, undergraduates, doctoral students, young researchers, employees and jobseekers who may be:

- 'revealed talents': those aware of their capabilities and aptitudes but who experience difficulty in exploiting them;
- 'hidden talents': those who have talents but who are not yet completely aware of them.

The TalentCampus programme thus offers two paths, tailored to the needs of these two groups, one to develop and valorise revealed talents, the other to reveal the hidden talents. Further and related aims of the programme are to reinforce social competencies (communication, self-confidence) and to raise awareness of the importance of interpersonal skills. This combined approach thus serves the dual goal of improving employability through the development of personal fulfilment. It is important to note that the key point of TalentCampus consists in mixing different learners; it guarantees diversity in terms of age, culture and disciplines.

The classes rarely take place in the classroom, and may well be out in the open air! The courses are based on innovative learning approaches (active learning, collaborative learning, project-based learning) and learners take away with them a tool kit to help them implement their talent, a network of talented and original contacts and an accreditation recognising their competencies.

Evaluation of the first TalentCampus summer school

The first TalentCampus summer school took place from July 2nd-13th 2012 and welcomed 23 participants aged 17 to 57 (13 female, 10 male). The evaluation of the summer school was carried out by IREDU (Institute for Research in the Sociology and Economics of Education, FRE 3497 CNRS / Université de Bourgogne) for the quantitative aspects and by the Joseph Jacotot International Institute for the qualitative (Briet et al., 2012). Based on the evaluation of the first TalentCampus summer school, a scientific paper has been published by the IREDU laboratory in order to estimate the impact of the evaluation of learners on their ability to take into account their competences (Bauchet & Morlaix, 2013).

The 23 participants were made up of:

- 1 high school student;
- 14 students from different disciplines (sciences, education, management, engineering, communication);
- 2 doctoral students (chemistry, communication);
- 2 employees;
- 3 unemployed.

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The evaluation shows a largely positive appreciation with a high level of satisfaction, a good understanding of the approach and its aims and a high level of engagement on the part of the learners. Group dynamics were particularly strong and the diversity of the group, in particular the intergenerational dimension, was perceived as supporting cohesion. For several participants, working in groups was something very new. However, many found it difficult to define what they had learnt and it was more through applying the competencies and talents developed (during the weekend in between the two weeks of the course for example) that learners were able to recognise an evolution. The main outcomes were seen to be an increase in self-awareness and self-confidence.

The following radar diagram shows an evolution of more than 15 % in 6 intra-individual social competencies: concentration, self-esteem, reactivity, tenacity, spirit of initiative and motivation compared to before TalentCampus (blue line) and after (red line).

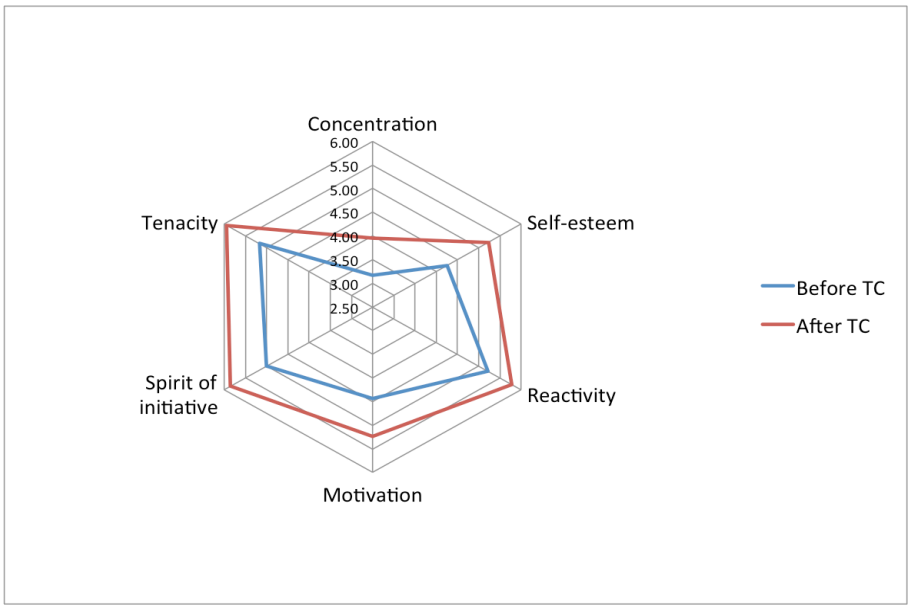

Figure 1. Radar diagram showing evolution of intra-personal competencies before and after TalentCampus

In terms of interpersonal competencies, the evolution of the group score was less marked than that relating to intra-individual competencies. The 5 competencies which were evaluated are: the ability to live in society, oral expression, attention span, codes in society, team spirit and the ability to negotiate.

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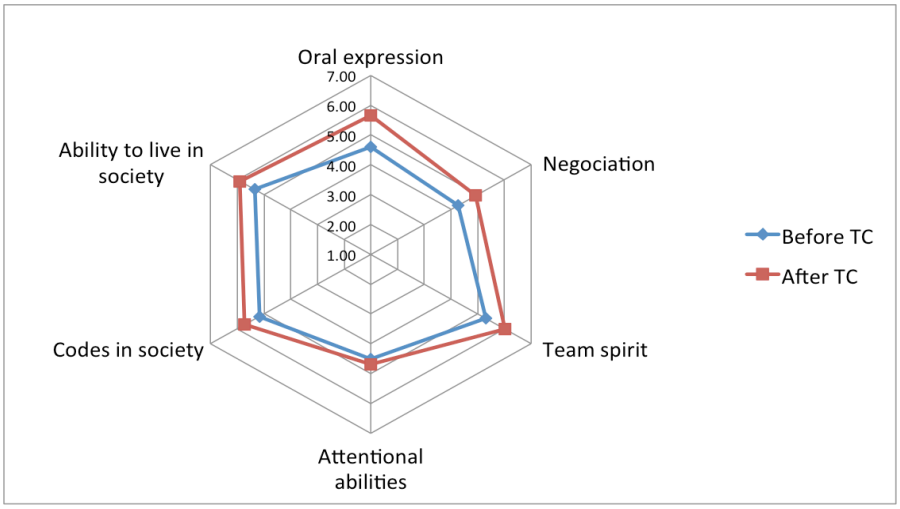

Figure 2. Radar diagram showing evolution of interpersonal competencies before and after TalentCampus

When asked "what is your talent", learners responded the most frequently: analytical thinking, tenacity and intellectual curiosity. The overall conclusion was that of a well-organised event, during which learners needs and profiles were taken into account by the trainers, organisers and evaluators and which successfully integrated collective and active pedagogies. Learners particularly appreciated having a safe space for personal expression, something seen as very rare in other learning contexts.

In terms of areas for improvement, the following priorities emerged:

- define more clearly the aims and finalities of the TalentCampus concept, in particular the notion of talent itself;
- reinforce the needs analysis;
- strengthen the coordination between different trainers and generate more links between modules;
- develop the follow-up after the face to face summer school;
- enable learners to take a more active role in defining their learning paths and to take initiatives.

The integration of these improvements and others will be evaluated at the winter school (Feb 16th-22nd 2013), the results of which will also be presented at the EDEN Annual Conference 2013 in Oslo, Norway, as mentioned in the introduction.

The role of digital and social media in the detection and development of talent

The TalentCampus team is currently exploring ways of enriching the learner experience through the judicious integration of digital and social media, which "can support more engaging and playful approaches, provide new formats for creative expression and encourage teacher and learners to experiment with different, innovative, ways of articulating their

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thoughts and ideas" (Redeker et al., 2010). However, given the complex dynamics which make up the TalentCampus concept, where spontaneity, surprise and challenge play a key role during the face to face training, we need to establish whether these might be lost or enhanced once social media come into the picture.

Having said this, there is a distinct need to provide continuity before, during and after a 'course', in particular with the development of the international summer school for 2014. The University of Burgundy already has a dedicated social network, uB-link, which over the past 18 months has been successful in connecting students to future employers and in fostering the development of communities within and beyond the institution. Adapted for TalentCampus, uB-link will be able to offer incoming participants with the chance to connect with each other and explore themes relating to the forthcoming event. It can also offer a framework for durable collaborative exchanges, as a means to develop new ideas or new projects as well as mutual assistance and peer learning between members.

Digital media represent a concrete form of expression, drawing on the talents revealed. Film and stop-motion animation workshops integrated into the programme for the next TalentCampus summer school not only build on creativity and collaboration competencies, but once published also help bring the learners' experience to a wider audience, reinforcing self-expression and self-confidence. The use of ePortfolios and Twitter are also being explored as a means to encourage learners to develop their digital identity and expression of their talent, in addition to blogs which can support reflexive learning and the development of learning to learn competencies (cf. the eLene2learn project), as well as the social construction of knowledge through narratives, enabling learners "to participate meaningfully in the exchange of experiences and ideas" (Pachler & Daly, 2009). While there is a great deal of research and experience to be drawn on in relation to how web 2.0 technologies and practices can foster effective learning, further research will be necessary to gain a clearer picture of the role that participation in social media plays in the actual detection and development of talent.

Form of the presentation

After presenting the TalentCampus approach and the philosophy behind it, the presenters will analyse the results of the initial evaluations before switching to conversation mode, involving the audience actively in exploring the third aspect, namely the role digital and social media can play in the detection and development of talent. It is for this reason that we consider it vital to give the presentation as a duo or trio, with one presenter playing the role of interviewer to provide the necessary dynamics. This approach will obviously be tailored to fit the constraints of the session in which the presentation is included.

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ELICITING STUDENTS' VOICES THROUGH SCREENCAST-ASSISTED 'FEEDBACK ON FEEDBACK'

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Background

Effective feedback not only enriches the learning experience, but is essential to successful learning (Hurd, 2000; 2006; Ramsden, 2003; White, 2003), yet the results of the UK National Student Survey (2012) show that feedback remains an ongoing challenge for HE institutions in terms of student satisfaction.

Even assuming that the quality of assignment feedback is excellent in its content and timing, it can only be effective provided that learners engage with it (Nicol, 2010; Black & Wiliam, 1998). However research has shown that learners do not always engage with the feedback provided. In a recent study, Furnborough and Truman (2009) identified three patterns of student engagement with external feedback amongst distance learners studying languages at beginner level: Group A saw feedback as a learning tool which "empowered" them to take on more responsibility for their own learning, Group B primarily related it with a sense of achievement (e.g. good grades), and Group C, did not value assignment feedback and seemed either unable or unwilling to take their tutor's comments on board because of doubts or anxieties about their own performance.

So given that feedback is such a potentially valuable tool for effective learning, why would those students fail to engage with assignment feedback or feel dissatisfied with it? A common problem is that there is often a mismatch between the students' needs and expectations on the one hand, and the tutors' assumptions and practices on the other (Orsmond & Merry, 2011).

Another line of research relates to the use of IT to improve the quality and effectiveness of assignment feedback. Many educational institutions have adopted electronic assignment management systems that improve the timeliness of feedback and the consistency of record keeping. Feedback can also be delivered through a variety of electronic media, which are especially useful in distance education. For example in the UK, the Open University routinely uses e-feedback in the form of standard templates for electronic reports (internally known as 'PT3 forms'), annotations on student's scripts using Word markup, and audio-recorded feedback. Certain tutors also give additional feedback by inserting links to screencast recordings in their written feedback.

The e-Feedback Evaluation Project

The e-Feedback Evaluation Project (eFeP) is a JISC-funded collaborative project involving the Open University (OU) and the University of Manchester, UK. The aim of the project is to evaluate the use of spoken and written e-feedback in a context in which these modes of delivery have been adopted by a Higher Education institution across an entire subject area. One such context is the Open University, where the use of both audio-recorded and written e-feedback has been standard practice at the Department of Languages for a number of years. The evaluation looks at staff and student perceptions of assignment feedback, the quality of feedback itself, and student engagement with the feedback.

More specifically, the project aimed to evaluate:

- the students' and tutors' attitudes to assignment feedback in each of the media commonly used at the OU;
- the quality of feedback in three of the media used in terms of the criteria being assessed and the depth of feedback on strengths and weaknesses;
- the effectiveness of feedback in terms of student engagement and response.

These three evaluation strands were respectively evaluated by means of staff (N=96) and student (N=736) surveys; qualitative analysis of tutor feedback on 200 language assignments; and talk-aloud protocols consisting of screencast recordings in which students (N=10) talked through the feedback written by their tutors on one of their assignments, or in other words, gave feedback on the feedback. This paper will focus on the latter strand, hereafter referred to as the 'feedback on feedback' (F/F) study.

Feedback on feedback

The F/F study was designed as a follow-up to the staff and student surveys and the analysis of tutor feedback. The aim of the study was to elicit and evaluate the students' cognitive, metacognitive and affective responses to their tutor's feedback. In analysing the recordings, special attention was given to the attitudes and perceptions reported in the surveys, as well as the features of tutor feedback that had been identified in the feedback analysis study. For reasons of space, the results of those two studies cannot be reported here, but relevant findings will be reported in the discussion section as appropriate.

Subjects

Participants in the study were adult university students studying distance learning modules in Spanish at the Open University. Out of the 736 language students who took the student survey, the 210 who were taking Spanish modules were invited to participate in the follow-up study. 88 of these agreed to be contacted and were sent an overall description of the study. Twenty of them subsequently requested the necessary instructions to produce the recordings. The final sample consisted of 10 students, who were the only ones to return a set of recordings. Such a high dropout rate was expected given the voluntary nature of the task, the

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challenge of trying out a new technological tool, and the fact that these were adult distance learners who had just completed their respective modules. As a result, the sample is not entirely representative of the student population as a whole, but of a highly motivated, high achieving minority. Indeed their marks on the assignment used all ranged between 75 % and 94 %, and this was taken into consideration when interpreting the data. All the levels taught at the OU were represented in the sample, which consisted of two students taking the beginner module, two from the lower intermediate module, four from the upper intermediate, and two from the advanced module. The sample comprised 5 males and 5 females. Three of the female students were not English native speakers and the remaining students were English native speakers. All were fluent enough to study a final year degree module in the UK and had no difficulty expressing themselves in English.

Method

Students were given a written set of instructions and a screencast showing a simulated talk-through recorded by one of the researchers. All the necessary material was available online. The recording tool used was Jing, which allows a maximum recording time of 5 minutes. Students were asked to produce two recordings each: one about their marked written script (TMA) and another one about the accompanying feedback summary form (PT3). Students were sent anonymised copies of these document files so that no personal details could be seen on their recordings. In their task brief, they were encouraged to talk us through the assignment feedback, covering any aspects that they considered relevant, such as their first reaction to the feedback, which comments they did or did not understand, which ones they found useful or not useful, what feelings different comments elicited, what use students made of the feedback, and what they learned from it. Once the recordings were completed, students submitted them by email. Thus, from the initial briefing to the final submission, the entire process took place electronically.

Each student's recordings were analysed in terms of their use of the two media (TMA script and PT3 form); their cognitive, affective and metacognitive responses to comments on strengths and comments on weaknesses; and their responses to different depths of feedback relating to strengths and weaknesses of their work. The notion of depth, proposed by Brown and Glover (2006) refers to feedback that either indicates a weakness/strength (depth 1), corrects the error/describes the strength (depth 2), or gives an explanation (depth 3). Fernández-Toro, Truman and Walker (2013) suggest an additional level for cases where errors or strengths are categorised, for example when tutors use codes to indicate the category to which an error belongs (e.g. gender agreement). Thus, the four depths considered in this analysis are:

1. Indicated;
2. Categorised/Described;
3. Corrected/Exemplified;
4. Explained.

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A further category was added where some kind of action to avoid an error or build on a strength in future is proposed. As the brief given to the students was fairly open, responses to different types of feedback cannot be compared quantitatively. Therefore the next section will focus on describing typical responses and propose a framework for interpreting them.

Results

Students' reported strategy for using the feedback

All students reported looking at the PT3 form before the TMA script, and all started by looking at their mark. They were also generally enthusiastic about receiving an overview in the general feedback form. As for the script, one student admitted that she had not really looked at it much, whilst another reported that she normally sets it aside until she has enough time to work systematically through each comment on her script. Printing out the feedback is common practice, sometimes in parallel with the computer, as markup comments on Word can be easier to read on screen than on paper. Subsequent use of the feedback was reported in only three cases, normally for revision purposes before the final assessment. Although all students found the feedback useful and clear, one stated that she had not learnt much from it and would just continue doing the same as she had been doing in her assignment.

Students' responses to feedback on weaknesses

Where tutors annotated or commented on problem areas, a number of possible responses were observed:

- **Active integration:** Understands the information provided by the tutor and elaborates on it. For example, a correction is given and the student then adds a categorisation (e.g. 'gender agreement') or an explanation ('because *población* is feminine'); or the tutor gives an error category (e.g. ´verb form´) and the student then provides the correction ('I should have written *fueron*').
- **Attempted integration**: Tries to elaborate on the feedback but produces an inaccurate/inappropriate interpretation (e.g. correcting the tense of a verb when the problem actually related to the verb´s meaning).
- **Informed acceptance:** Appears to understand the information provided in the feedback but does not elaborate on it (e.g. [looking at a spelling correction] 'Oh yes, that was silly!').
- **Uninformed acceptance:** Acknowledges the information provided by in the feedback but there is no evidence of understanding (e.g. [tutor rewrites a sentence] 'yeah, that sounds better').
- **Uncertainty:** Acknowledges lack of understanding ('Can't understand why *aunque* is deleted here').
- **Rejection:** Disagrees with the information provided by the tutor ('it does annoy me when she says I should have included more information when the word limit is so ridiculously low´).

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- **Evaluation:** Evaluates the error, either by explaining what caused it (e.g. Russian student says 'past tenses are different in Russian') or by voicing an evaluative judgement about their performance ('silly mistake').
- **Planning:** Proposes some kind of action to improve performance ('I must revise prepositions').

In any of these responses, cognitive and affective elements may be present in varying degrees. The first three are more cognitively oriented. Uninformed acceptance is also cognitively oriented, although it may reflect an underlying avoidance strategy rooted in affective factors such as fear of challenge. Conversely, rejection often has a clear affective component while its roots may be cognitive (e.g. feeling that a correction is unfair because you do not understand it). Evaluation and planning are mostly metacognitive, but again may be related to affect, for example in face-saving judgements such as 'silly mistake' or giving reasons for errors in an attempt to justify them.

Students' responses to feedback on strengths

Cognitive, affective and metacognitive elements were also present in the students' responses to feedback related to the strengths of their work, though the most evident aspect was the affective response:

- **Appreciation of effort recognition:** Student is pleased to see his/her efforts acknowledged in the feedback ('It was quite difficult but you see my tutor says *well done*'; 'Two ticks for my quotation at the end! I like that quotation and I am very pleased that my tutor liked it.'). This was the most common response to feedback on strengths.
- **Appreciation of personal rapport:** Student feels that the feedback treats him/her as an individual (e.g. personal greetings).

Cognitive and metacognitive responses generally mirrored those elicited by feedback on weaknesses, although some response types were less apparent for feedback on strengths:

- **Active integration:** e.g. tutor says 'good introduction' (Depth 2: strength categorised) and student adds that she made sure to include 'the mandatory quote' in her introduction (Depth 4: strength explained).
- **Attempted integration:** A correction may be interpreted as praise (e.g. tutor says 'you exceeded the word limit' and student then explains that she always worries that she will not be able to write so much 'but you see I exceeded that!').
- **Informed acceptance:** e.g. 'Good. I got that one'.
- **Planning:** e.g. 'She tells me my referencing system is correct so if I use that in my final assessment I'll be ok'.

Not too surprisingly, no examples of rejection were found in response to feedback on strengths, though previous research has shown that these can occur in certain cases

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(Fernández-Toro, Truman & Walker, 2013). Explicit evaluations were also difficult to pinpoint as they were generally blended with planning, integration and affective responses.

Depth of feedback

For reasons of space, only the most indicative responses to different depths of feedback will be summarised in this paper. In the case of feedback on weaknesses, the determining factor for students' responses was whether tutors had provided enough information to elicit active integration or informed acceptance. Feedback on 'basic' mistakes such as spelling and gender agreement did not generally require a correction or an explanation in order to do so; whereas feedback on syntax and lexical errors could more easily result in failed attempts of integration, uninformed acceptance or rejection unless a suitable explanation was provided. The two advanced students who attempted to use vocabulary in a metaphorical way failed to understand why the tutor had corrected the words that they chose and rejected the corrections as 'patronising' or repressive: 'metaphors have been obliterated by the tutor […] another image that was not appreciated or completely wrong, but it's not clear. It's a shame that at level 3 we are not allowed to explore'. In other cases, students just accepted syntax corrections that they did not understand: 'I can accept that but I would probably make that mistake again in the future'.

In the case of feedback on strengths, it is worth noting that tutors' comments including explanations (depth 4) or specific examples drawn from the student's work (depth 3) are extremely rare in the sample. Comments that simply say that the work is good (depth 1) normally elicit positive affective responses related to effort recognition and personal rapport with the tutor. Ticks elicit similar responses. However, high achievers may find that acknowledging the good quality of their work (for example by giving a high mark) is not sufficient: 'I gained pleasing scores of 90 %, and again what would I have had to do to achieve 100 %?'. Where present in the feedback, examples (depth 3) are welcome: 'I like the fact that she gives me specific examples of connectors that I've used'. However only one such comment at depth 3 was found in the sample, and no further depth was used by tutors in comments relating to strengths.

Discussion

The responses described above could be grouped into two categories: The first group are responses that indicate that an effective learning dialogue is taking place through the process of giving and receiving feedback, both between tutor and student and within the student him/herself. The second group are responses that indicate either that such a dialogue is not taking place at all, or that somewhere in the process communication is breaking down. Effective feedback dialogue elicits knowledge construction (Nicol, 2012), promotes a positive perception of oneself (Nicol & Macfarlane-Dick, 2006), sustains motivation (Dőrnyei, 2001; Walker & Symons, 1997), and promotes autonomous learning (Andrade & Bunker, 2009; Truman, 2008). Conversely, ineffective feedback dialogue does not result in knowledge construction, challenges the self, is demotivating and fails to promote learner autonomy.

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Table 1 summarises the responses that are deemed to indicate effective and ineffective feedback dialogue.

Table 1: Students' responses indicating effective and ineffective feedback dialogue

	Effective feedback dialogue	**Ineffective feedback dialogue**
Cognitive responses	Active integration Informed acceptance Uncertainty that elicits focused planning	Attempted integration Uninformed acceptance Rejection Uncertainty that does not elicit focused planning
Affective responses	Personal rapport Effort recognition	Lack of acknowledgement of the student as individual Effort not recognised
Metacognitive responses	Evaluation coupled with positive emotion and active integration Planning that focuses on relevant areas	Evaluation coupled with negative emotion Lack of planning, or planning that does not focus on relevant areas

As explained above, the participants in this study were highly motivated students, and therefore it would be reasonable to expect a considerable number of responses indicating that effective feedback dialogue was taking place. Indeed, cognitive responses to feedback on weaknesses, especially those related to what students regarded as "silly mistakes" (spelling, agreement, missing references, etc.), tended to result in the construction of knowledge through active integration or informed acceptance. Positive affective responses to feedback on strengths, especially to perceived personal rapport ("she spotted I am French, well done tutor", pleased to be singled out to receive feedback in Spanish, etc.) and effort recognition were also very common, as were metacognitive responses in the form of planning strategies to improve future performance.

However, somewhat unexpectedly in a group as motivated and high-achieving as this, a number of responses indicating ineffective feedback dialogue were also found alongside these constructive responses. Unhelpful cognitive responses such as uninformed acceptance or attempted integration tended to occur with feedback on errors related to more complex structures, such as syntax corrections that were left unexplained [i.e. depth 3 with no coverage of depth 4]. At more advanced levels, unexplained lexical corrections were perceived by students as the tutor's failure to appreciate their creative attempts at experimenting with the language through the use of metaphors. This caused them to reject the feedback both on cognitive and affective grounds, as they felt that their personal efforts had not been appreciated. Well-intended tutor support was also rejected when students suspected a one-size-fits-all approach that failed to take their individuality into account (e.g. lengthy technical tips given to a student who had worked for years in IT, cut-and-paste invitation to contact the tutor at the end of a feedback form, etc.).

The presence in the sample of responses indicating both effective and ineffective feedback dialogue is consistent with claims commonly voiced by tutors that their feedback, or at least some of it, often does not achieve its intended purpose. The roots of the communication

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breakdown may be cognitive, as in cases where the depth of feedback was not sufficient, or affective as when students felt that their efforts or individuality were not being duly acknowledged. The fact that even a highly motivated group of students such as the participants in this study occasionally failed to integrate tutor feedback suggests that this type of occurrence might be considerably more common in a sample including a wider range of abilities and motivational levels.

Conclusion

This study shows that highly motivated students do engage with tutor feedback and make active efforts to integrate it. However in some cases their cognitive, affective, or metacognitive responses to the feedback are ineffective. The previous discussion suggests that a tutor's incorrect assumptions about the student's abilities, expectations or attitudes in relation to feedback can contribute to these occasional breakdowns in communication. By giving students a voice, the 'feedback on feedback' method used in the study encourages students to articulate their responses to the feedback and makes it possible to identify what comments result in successful or unsuccessful feedback dialogue. The present study has two limitations: Firstly the self-selected nature of the sample means that it does not represent the student population as a whole, and the study would need to be repeated with a randomly selected sample including less motivated and able students. Secondly, as the 'feedback on feedback' exercise conducted here was intended for research purposes, the students were addressing the researchers rather than their tutors, thus missing out on a valuable opportunity for genuine feedback dialogue. Despite these limitations, the fact that recordings were submitted at all shows that the method is potentially viable and could be implemented as a means of promoting feedback dialogue between students and tutors, both in face-to-face and distance learning environments. Tutors could, for example, invite all their students to comment on their feedback after the first marked assessment on a course, or they could use the method in a targeted way whenever they suspect that a student is not learning from their feedback. The findings of this study also indicate that high achievers would also benefit from the exercise and should be given the opportunity to make their voices heard.

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"I ENJOYED USING SRS IN THE CLASSROOM" – A RESEARCH STUDY OF STUDENT RESPONSE SYSTEM IN NORWEGIAN CLASSES AND IN FURTHER EDUCATION OF LANGUAGE TEACHERS IN NORWAY

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Introduction and background

This paper describes a small scale pilot study leading to the inclusion of a student response system (SRS) as part of the curriculum in a further education course for language teachers. It also presents how the language teachers attending the further education course evaluated the SRS, both as a pedagogical tool in the classroom and as part of the curriculum of a further education course for language teachers.

In the literature, SRS is referred to by different names: *personal response system* (PRS), *audience response system*, *clickers* and *classroom response system*. The SRS technology makes it possible for a teacher to present a question or problem to the class, and the students will give their answer anonymously though a response device. The question can be a multiple choice question with one or more correct answers, yes/no or true/false. Alternatively, a problem with various possible solutions, i.e. no right or wrong, can be presented to the students in order to stimulate discussion in small groups or the whole class (see for instance 1-3). The answers from all the students may immediately be presented (as for instance a histogram) to the teacher and the class. All the students are given the opportunity to answer the teacher's questions, compared to the usual show of hands, where only one or two students will answer. The teacher obtains an instant overview of the class' knowledge on a particular topic, and the students will get instant feedback on whether they answered correctly. The SRS systems have been on the marked for many years, but have not received much attention as a pedagogical tool in Norway. This might be explained by the costs related to implementing the SRS technologies in a class room. The SRS referred to in this study is developed by Sør-Trøndelag University College (HIST). This particular SRS has the advantage that it is free of charge to use, and it works on computers, as well as iPods/iPads and Smartphones, as long as the device has wireless access the internet. Hence, it is not necessary to purchase additional technological equipment since most schools in Norway already have these wireless internet and the students have access to at least one of the abovementioned devices.

Previous research has shown that students seem to find the lectures more enjoyable when SRS is used. In a study by Boyle and Nicol (2003, p.51), 98 % of the students in an *engineering mechanics* class concurred with the statement "*Using PRS […], helps me enjoy this class more than traditional lectures*". Investigations at Sør-Trøndelag University College (HIST) consolidate these results; 44 students (out of 59) in a *physics* class said that they "agree" or "strongly agree" with the statement "*I enjoy attending lectures where SRS is used*" (Stav et al. 2010). The overall conclusion to be drawn from this previous research is that the students perceive SRS as fun and enjoyable.

However, the existing literature shows a bias of the SRS investigations, as the majority of research papers focus primarily on students in higher education and/or use of SRS in science classes. Our main project goal was to develop a new online course for **language** teachers in primary and secondary education. The course was aimed at languages teaches already working in school, and it was a 2000-level specialization course. We also wanted the course to include training in the pedagogical use of various digital tools in language learning. Therefore, we had to investigate whether SRS was perceived a suitable pedagogical tool in language classes. If we found that SRS had similar positive effects on language learning as reported in previous studies done in science classes, we would include SRS as curriculum in the new online course for language teachers.

The pilot study

We conducted a pilot study which included training of volunteer teachers in the use of SRS, and subsequent observations of these language teachers as they incorporated SRS in their own teaching. The observations were conducted the very first time the teachers tried the SRS in their classrooms, and consequently, it was the first time the pupils (mean age: 17;7) were introduced to the system. The subject was Norwegian; one class had a lesson on Norwegian language history, and the other was focused on literature, more specifically Romanticism. Afterwards, all the pupils had to fill out a questionnaire concerning the use of SRS. After the lessons, we interviewed two pupils from each class, and the teacher. Table 1 shows a selection of the questions from the questionnaire, and the results from both classes.

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Table 1: The pupil's answers regarding the use of SRS in two Norwegian classes in upper secondary school

	I strongly agree	**I agree**	**I disagree**	**I strongly disagree**	**I don't know**
"I enjoyed using SRS in class"	25	18	2	0	0
"The use of SRS made me more engaged in class"	29	14	1	1	0
"I found it easier to answer the teacher's questions when it was anonymous via SRS"	19	16	4	2	0
"SRS should be used more in upper secondary school"	22	18	2	0	3
	To a high degree	**To a certain degree**	**To some degree**	**To a minor degree**	**I don't know**
"To which degree do you think that SRS can contribute to your remembering more of the subject-related content of the teaching?"	17	23	4	1	0

The results showed that 43 (out of 45) pupils agreed or strongly agreed with the statement "*I enjoyed using SRS in class*". 43 pupils agreed or strongly agreed that the use of SRS made them more engaged in class, and 40 pupils agreed or strongly agreed with the statement that SRS should be used more. All these results suggest that SRS contribute to more fun and more engagement in the classroom. Of course, one might argue that enjoyment and engagement do not necessarily lead to more learning. However, 40 pupils expressed that the use of SRS to a high degree or a certain degree would contribute to them remembering more of the subject-related content. As one pupil expressed in the interview afterwards: "*Jeg tror faktisk jeg ville lært en del mer, også. Det blir jo en naturlig følge av det å følge med, på en måte*". ("*I actually think that I also would learn quite a bit more. That's a natural consequence of paying attention, sort of.*")

Since the observation was conducted the very first time the pupils met the SRS, one might think that their positive attitude stems from the charm of novelty and that this might wear off if the SRS is used on a regular basis. We specifically asked the pupils in the interview whether they thought the interest in SRS would wear off, but the interviews revealed that the pupils did not think so. They claimed that they would continue to pay more attention than they would have done with the traditional teaching as the SRS made them more involved in the teaching sessions. This implies that SRS is a pedagogical tool that would continue to be engaging for the pupils.

Prior to the observation, we gave 45 pupils a questionnaire and asked them how often they raised their hand in class to answer the teacher's questions, and we discovered that 24 % of the pupils said that they "rarely" or "very rarely" did so. In other words, ¼ of a class rarely or very rarely engages in a traditional question-answer activity (Q-A). According to Klette (2004), the

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teacher-directed activities (which include Q-A activity) in 9th grade amount to 47 % of the classroom activities (p. 33). The pupils who rarely or very rarely engage in Q-A activity will take on a passive role during much of their time at school. Therefore, we wanted to see whether the use of SRS would make it easier to engage the whole class in the Q-A sessions. After the pilot study, 35 pupils agreed or strongly agreed with the statement "*I found it easier to answer the teacher's questions when it was anonymous via SRS*". 6 pupils disagree or strongly disagreed with the statement. We do not know whether these 6 pupils belong to the quiet ¼ of the class or not. However, it is likely that the 6 pupils who did **not** find it easier to answer the teacher's questions via SRS are those who have no problems with raising their hands and answering the teacher in the regular manner. Still, an obvious advantage of the SRS in Q-A activity, is that **all** the pupils are allowed to give their answer to the teacher's question, as opposed to the traditional manner where one, or perhaps two, pupils are given the chance to respond. And the majority of the class (35 pupils) thinks that the SRS makes it easier for them to answer the teacher's questions.

The interviews with the teachers suggested that they too found the SRS to be a useful tool, and they noted that the SRS made it easier for them to maintain the pupils' attention.

One of the teachers pointed out that it might be a danger that the pupils are so eager to use the SRS, that they spend their time in class just waiting for the next time they are allowed to "push the button". In this respect, the pupils will be less interested in the teaching sessions, and only focus on the SRS sessions. However, the interviews with the pupils imply that they actually perceive themselves as paying **more** attention to the teaching because they know that they have to in order to be able to answer the SRS question correctly later on. All in all, the results from the questionnaire, the interviews with the pupils and the teachers clearly suggest that SRS is a pedagogical tool suitable for language teaching and that it can be used in language learning.

The online course for language teachers and their experiences with SRS

Based on the results from the pilot study, we incorporated SRS as part of the curriculum in online course for language teachers. The language teachers attending the course were offered a two-day seminar at the beginning of the semester, which included hands-on training in SRS.

As a compulsory activity, the teachers had to create a teaching plan including the use of SRS, and carry it out in their own English lessons. Afterwards, they wrote a blog about their experiences.[1] The response from the language teachers attending the course suggests that they see many benefits in using SRS as part of teaching. First of all, the teachers mention the motivational aspect in using SRS. The pupils enjoy using a technological device in the classroom, and they wish to give the right answer to the SRS questions. Secondly, the SRS makes it easier to get the pupils attention. In one class, the pupils had to make the SRS questions themselves, and read them out loud to the rest of the class. Their peers then had to listen carefully to the alternatives, in order to answer the SRS correctly.[2] Thirdly, the pupils

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enjoy the instant feedback presented to them as a histogram by the SRS. The teachers also found this feature very useful. They emphasise that they can use the instant results from the SRS to find out whether they need to go back and revise something they have said previously in the lesson since the SRS reveals if the pupils have actually understood the topic that the teacher has just explained to them. Finally, one of the teachers maintains that the SRS seems particularly beneficial for two groups of pupils: the silent ones, and the ones with attention challenges. Perhaps the motivational aspect that the SRS brings to the classroom has a particularly positive impact on the pupils who usually find it hard to concentrate over a long period of time. For the silent pupils, they will feel more actively engaged in the Q-A activities, and if the SRS frequently confirms that their answers are correct, the silent pupils might get the confidence to participate in the regular show of hands as well. However, this is something that must be investigated more closely in later research.

What we found most surprising was that the teachers thought that SRS could be used in as early as 2nd grade (age 7) in primary education. Initially, we believed that the SRS was a tool suited for lower secondary (age 13-15) and upper secondary (16-19), but the teachers maintained that it could easily be incorporated in lessons in the lower grades, too. However, here the technological issues are more challenging as primary schools often have dedicated rooms for computers. If the teacher wants to use SRS, the whole class then has to move to a different classroom. This is very time demanding and gives the teaching an unnatural and unfortunate break.

Some reflections related to observed uses of SRS

During the seminar with the teachers on the course and in the pilot study, we observed that the SRS question **and** the multiple choice alternatives were usually shown simultaneously on one Power Point slide. As an illustration, we'll use an authentic example from the class on Romanticism. The SRS question was: *If you were Elizabeth Bennett, would you have said "I do/Yes" the first time Mister Darcy proposed*? The alternatives are given in (1-3).

1. Of course! This is a marvellous opportunity. Darcy is rich and handsome. Elizabeth is poor and soon too old to get married.
2. Of course not! To marry a man, who quite clearly thinks that he's marrying beneath his dignity, and is troubled by this, is not an option. Love should conquer everything.
3. I don't know. It's difficult to fully understand how the social rules and conventions in Austen's time affected a woman's possibilities to choose.

In order to make sure that all the pupils focus on the question, and not begin to read the different alternatives straight away, we would like to suggest that the teacher first should reveal the question only. This will ensure that the pupils have their attention focused solely on the question, and we think that the risk of misunderstanding the question will decrease. In addition, if the different alternatives are quite long (as in example 1-3), we believe that they should be revealed one-by-one. Again, in order to make sure that the pupils focus specifically

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on the actual content and meaning of one alternative, instead of skimming through the alternatives, and perhaps not getting the difference between the various alternatives quite right. This will prevent the danger of pupils giving the wrong answer based on careless reading. In example (1-3), there is no right or wrong answer, but it is still important that the pupils understand the meaning and the differences between the alternatives. In addition, we maintain that it is vital that the teacher reads the question and the alternatives out loud to the class before the SRS session starts in order to help the pupils with dyslexia or other learning challenges to answer.

Conclusion

As the present study shows, SRS is a useful pedagogical tool also in language classes; in other words, the technology is not only restricted to science classes. The technology is well-suited for classes in lower and upper secondary schools, but can also be used in primary schools, if the infrastructure allows for it. Based on our study, it is not possible to say whether the use of SRS increases the learning outcome for the student/pupil, and this remains therefore an open question for further research. However, it is possible to draw the conclusion that the pupils find the teaching more enjoyable when SRS is used. This obviously contributes to other desirable effects, such as more motivation for learning and increased attention.

Based on the pilot study and the experiences made in the online course for language teachers, we draw the conclusion that it is beneficial to include training in SRS in further education for language teachers. In this way, they will be equipped with the skills to use SRS in a classroom as a means to vary their teaching. Teachers who succeed in engaging the whole class in their subjects are also likely to find their teaching more enjoyable.

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[1] The blogs are written in English, and are available at: http://spraak6200.wordpress.com
[2] The teacher noted that one should probably write down one keyword for each alternative on the blackboard in order to keep the different alternatives from each other, because it proved very challenging for the pupils to listen to the various alternatives, especially when there were many to choose among.

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STUDENT MOTIVATION AND ENGAGEMENT IN 1:1 DIGITAL LEARNING WITH TIME TO KNOW (T2K) – HIGHLIGHT RESULTS FROM CROSS-COUNTRY STUDIES

Rinat Shahaf-Barzilay, Dovi Weiss, Time To Know, Israel

Introduction

Over the past decade, there has been an increasing demand for technology-rich education focused on engaging and empowering learning experiences that prepare learners to be active, creative, knowledgeable, and ethical participants in a global, networked society, that is, to develop 21st century skills (U.S. Department of Education, 2010). Innovative, technology-rich learning environments, specifically 1:1 laptop technology initiatives, can become a method for paradigmatic change in teaching and learning by providing engaging environments and tools (Cuban, 2006; Salomon & Perkins, 2005; Weston & Bain, 2010).

A technology-rich learning environment provides access to wider and more flexible learning facilitators, including teachers, parents, and mentors outside the classroom. Learning experiences can be individualized or differentiated, with flexibility in content that fits the interests and prior experience of each student. In a rich, 1:1 computing, social-constructivist learning environment, students are given opportunities for taking ownership of their learning. Prior research has shown that a technology-rich learning environment can more effectively promote social-constructivist educational goals, such as higher order thinking skills, the motivation to learn, and teamwork, in comparison to traditional settings (Rosen, 2009; Rosen & Salomon, 2007). Moreover, studies of 1:1 computing initiatives to date have found increased student engagement, more student-centred pedagogy, increased availability and use of student resources and products, and modest increases in student achievement (Bebell & O'Dwyer, 2010).

Time To Know (http://www.timetoknow.com) has introduced the first core curriculum teaching platform designed to function as the primary instructional platform in today's technology-intensive, 1:1 classrooms. The solution constitutes a comprehensive digital curriculum integrated with robust teaching tools for lesson planning, instruction, assessment, and reporting. It blends digital and traditional instructional activities, offering flexible lesson plans for different teaching and learning styles.

Time To Know (T2K) enhances student learning by providing engaging and adaptive content focused on exploration, inquiry-based learning, collaborative class discussions, multimedia activities, and games. T2K's classroom environment reinforces students' self-confidence, boosts learning motivation, and develops students' skills as team participants and self-directed learners.

Ongoing feedback during class enables the teacher to track each student's progress. It helps the teacher address student needs at varying levels of proficiency by prescribing individually customized activities and appropriate homework. T2K's teaching platform enables students to learn at their own pace and according to their own proficiency levels, making the complex task of teaching students with differing needs a reality.

T2K's innovative solution has been operating in various countries (USA, Israel, and South Korea) for five years with great success in terms of improving student learning outcomes and motivation.

The aim of this paper is to highlight findings from a multiple, cross-country (Israel, Texas, and New York City) evaluation research project on learning math with Time To Know. This paper will focus on student engagement and motivation after the first year of implementation in order to verify the potential of T2K's holistic solution to create joy of learning and teaching. The research was designed to learn about the effect of T2K's 1:1 computing environment on student learning and motivation (in math and English language arts [ELA]), and on teacher practices and beliefs.

Data relevant for this purpose was collected from students and teachers, while focusing on student learning needs, motivation, satisfaction, and perceptions of learning in a technology-rich learning environment. In addition, levels of engagement in math class, self-efficacy in learning math, and teachers' perceptions of teaching in this environment will be presented (Rosen, 2011).

Methodology

The research project was based on the mixed methods design (Onwuegbuzie & Teddlie, 2003) and pre-post testing with a comparison-group methodology. The data collected during the 2010/2011 and 2011/2012 school years included standardized assessment scores, school records on attendance and discipline, student and teacher questionnaires, students' drawings, interviews with teachers and principals, and student focus groups. Data was collected at the beginning and the end of the school year, and toward the completion of the yearlong school program (in 2011 and 2012). The Israeli research staff (previously headed d by Yigal Rosen) was involved in coordinating and analysing the data, but not in the program implementation.

This paper focuses on data on engagement and motivation obtained from questionnaires, student drawings, and interviews with teachers and principals.

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Tools and Analysis

Student and teacher questionnaires: At the beginning and toward the end of the school year, a research assistant asked experimental and control students to provide information about their motivation to learn math and their attitudes toward learning with computers. Teachers were asked about their attitudes towards teaching with T2K, and about their teaching practices and epistemology. The questionnaires were slightly different in each research (maximum data given concerning the focus of this paper is presented from each one).

It took about 15 minutes to fill out the questionnaire. Participants reported the level of their agreement with each item on a 5-point Likert scale (1=strongly disagree; 5=strongly agree). The level of agreement was calculated by the percent of respondents ranking 4 (agree) and 5 (strongly agree).

Student drawings: Students' drawings (in paper and pencil) provide a rich descriptive assessment of their invaluable perspective on the impact of technology (Russell, Bebell & Higgins, 2004). The students were given the following prompt: "Think about your 4th/5th grade classroom. In the space below, draw a picture of yourself studying math in school."

The researchers coded specific features of each student drawing using an emergent analytic technique to describe students' perspectives in the classroom. One of the six broad categories was "student demeanour": a student depicted positively, negatively, or neutrally. Data will be presented concerning this motivation oriented category. These drawing categories and codes exhibited both inter-rater and intra-rater reliability so that the codes assigned to the drawings were stable across different raters and over time (Haney, Bebell & Russell, 2004).

Teacher and principal interviews: The teachers and principals were interviewed separately at the beginning and at the end of the year. They were asked about implementation processes and the effect T2K had on their teaching practices. Each interview lasted approximately one hour.

Characterization of the sample

Data presented in this paper concerning the teaching and learning practices and attitudes towards T2K is based on:

- 44 classes from 20 Israeli schools: 36 teachers, 661 4th grade and 298 5th grade students;
- 15 classes from a Wylie District school in Texas: 4 teachers, 1 principal, 240 5th grade students;
- 6 classes from three Catholic New York Archdiocese schools (ADNY): 4 teachers, 3 principals, 68 4th grade and 69 5th grade students.

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Findings

The tables below summarize the findings after one year of implementation of the T2K program in 4th and 5th grade math classes in three different locations: Israel, Texas, and New York City.

Student engagement and motivation

The following table summarizes the attitudes towards learning math with T2K based on student questionnaires and drawings.

Table 1: Summary of Attitudes toward Learning with T2K after One Year, Based on Student Drawings and Questionnaires (Mean Percentage)

	ADNY		Wylie	ISRAEL	
	4th	5th	5th	4th	5th
I like math class	79 %	67 %	70 %	62 %	68 %
I am usually bored in math	11 %	20 %	23 %	-	-
Math is hard for me (reversed item)	-	-	-	10 %	11 %
I find math interesting	-	-	-	66 %	75 %
Learning with T2K made me a better student	64 %	64 %	37 %	70 %	68 %
Learning with T2K made my classes more interesting	91 %	84 %	78 %	82 %	85 %
Learning with T2K made my classes more fun	87 %	81 %	74 %	84 %	84 %
I enjoy learning with T2K	94 %	87 %	62 %	-	-
Student drawings – Student Demeanour					
positive	-	-	41 %	52 %	-
negative	-	-	5 %	10 %	-
neutral	-	-	10 %	13 %	-
Can't discern	-	-	44 %	25 %	-

Substantial Satisfaction and Endorsements of the T2K Program

Within the first year of implementing the T2K program, most of the 4th and 5th grade students across the three locations liked math class (62 %-79 %), and a relatively low percent felt that math was hard for them (10 %-11 % in Israel), or felt bored (11 %-23 %). In contrast, 66 % of the 4th graders and 75 % of the 5th graders in Israel found math interesting. For the most part, 4th and 5th grade students agreed or strongly agreed that learning math with T2K made them better students (64 %-70 %), although only 37 % felt this way in Wylie.

Above all, 74 %-91 % of the students in the three different locations stated that T2K made classes more interesting and more fun. Students enjoyed learning with T2K: 94 % of the 4th graders and 87 % of the 5th graders in the ADNY schools, and 62 % of the Wylie 5th graders. More can be learned about student attitudes from their statements:

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> *I really love the program and think it is very interesting and fun. The program helps me understand the learned subjects, and suggests more variety, and sometimes I get to play games (Israel, 2011). When we do the book nobody really pays attention as when the computer. When the video comes up we start laughing (ADNY, 2012). We get to play fun games but still learn! (Wylie, 2012).*

Positive attitudes can also be seen in the summary of student drawings. As Table 1 indicates, after one year of studying with T2K, 5th grade students in Wylie and 4th grade students in Israel showed a greater proportion of positive attitudes towards learning with T2K, in comparison to negative, neutral, or other attitudes. In the example below, a 5th grade student drew smiling girls, solving problems with laptops in a T2K classroom.

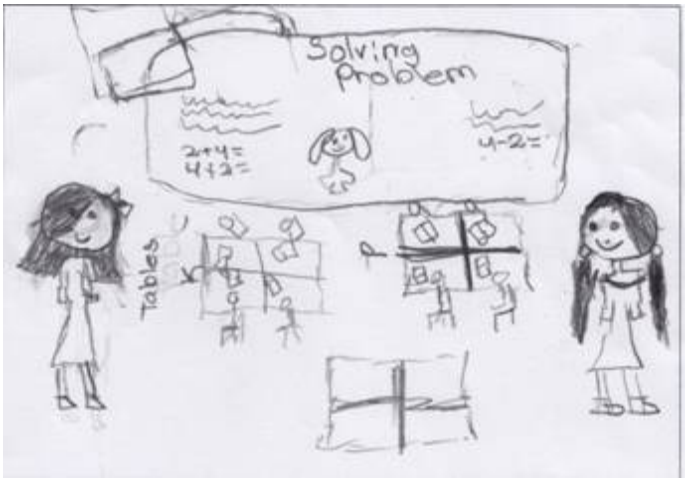

Figure 1. A Drawing of a 5th Grade Math Student

Increased Student Engagement

Table 2 below shows relatively high levels of student engagement by means of their interest in school, their willingness to learn, and their better understanding of math.

Table 2: Student Attitudes toward Learning with T2K after one Year (Mean Percentage)

	ADNY		Wylie	ISRAEL	
	4th	**5th**	**5th**	**4th**	**5th**
Learning with T2K made me more interested in school	78 %	62 %	64 %	75 %	77 %
T2K increases my willingness to learn	72 %	63 %	52 %	-	-
With T2K I understand math much better	77 %	61 %	46 %	68 %	76 %

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Teacher questionnaires confirm this direction, as shown in Table 3 below.

Table 3: Teacher Attitudes toward Teaching with T2K (Percent)

	ADNY	ISRAEL
Makes my students more willing to attempt solving problems independently prior to seeking assistance	50 %	75 %
Decreases negative behaviour issues	50 %	69 %
Increases student engagement	50 %	89 %
Teaching more interestingly	-	100 %

All of the Israeli teachers felt that with T2K they teach more interestingly. Both ADNY and Israeli teachers feel that issues of negative behaviour have decreased. Citing the principals and teachers shows the depth of the impact that teaching with T2K has made:

> *There's been a lot more students helping students. Some might just be with the technology. But I've also seen them look at the monitor and if the kid next to them is struggling I've heard them explain things to each other. They're taking ownership there for their classmates...The teachers have done a great job not teaching just the rule, but teaching the concept (Principal, Wylie 2012). The children are hooked when you walk into the room (Principal, ADNY, 2012). They're so much more focused and quiet. They enjoy what they're doing it's a big difference (Teacher, ADNY, 2012).*

To sum up, most students, teachers, and principals see the merits of learning math with T2K with respect to motivation and engagement.

Discussion and Conclusions

The purpose of this paper was to combine studies that focus on return on investment aspects in learning, such as possible changes in student attendance and discipline, while increasing access to educational opportunities (Greaves & Hayes, 2006). This cross-country research is consistent with other studies that examine 1:1 computing in terms of engagement and motivation towards learning, in relation to the level of implementation. Findings showed that after one year of studying with the T2K program, participants felt strongly that student engagement and motivation were high; students and teachers had more fun in math classes; and students were more interested and understood math better.

In each school, teachers and school administrators reported that students enjoyed learning with T2K; they were hooked, focused, quiet and took ownership for class learning while negative behaviour issues decreased. With T2K, students were motivated to learn and teachers were motivated to teach. This was apparent in their questionnaires and drawings.

Time To Know's interactive teaching and learning environment has enormous potential for creating joy of learning and joy of teaching because of its salient characteristics, such as: a high

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level of student engagement; relevant, attractive, and interactive tasks; active learning – learning by doing, problem solving, interactive tasks, and applets; differentiation – addressing individual students' needs, providing an adaptive environment, connecting among all the students; a meaningful learning environment – inquiry based activities; collaboration – using the digital teaching platform to collaborate in various ways (whole class collaboration by using the Gallery, team work); self-expression – supporting multiple intelligences; and a technology based environment – the natural environment for "digital natives".

These findings are in agreement with the National Education Technology Plan statement (Weston & Bain, 2010, p.9) that learning experiences should provide multiple and flexible means of engagement to tap into diverse learners' interests, challenge them appropriately, and motivate them to learn. Time To Know was developed to meet these goals, and first year findings show that teachers and students are on track.

The results obtained in the present study demonstrate the potential and possible educational benefits from technology-rich educational environments in the K-12 educational system. Notable educational benefits for pilot participants with the 1:1 T2K learning environment have included increased student computer use in ELA and math, increased 21st century skills among students, paradigmatic changes in teaching practices, increased student motivation, and increased student performance across subject areas (Rosen, 2011; Walters, Dede & Richards, 2010). Meaningful learning and achievement gains are more likely to emerge from innovative teaching and learning involving individualized, problem-based instruction, increased motivation, and engagement (Cuban, 2006). Nevertheless, learning outcomes and student achievement should be further investigated after further technology-rich environment implementation, which aims for a 'paradigm shift' (Harasim, 1990) while teaching and learning with joy.

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ON THE FLIP SIDE OF THE COIN – THINKING DISPOSITIONS IN LEARNING BLOGS

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Introduction

A blog (derived from the earlier term, web log) is an internet site where people write entries, or "posts" about experiences, news, and articles. The content of the posts is accessible to internet surfers, who can read them and, in most cases, react to them as well (Ellison & Wu, 2008; Pang, 2009). A learning blog, also known as an e-portfolio, is a collection of textual and/or multimedia web pages that includes resources, demonstrations, and educational activities that represent the student that posts them and his or her learning process.

Most blogs share three common characteristics:

1. Reverse-order chronological presentation of the narrative – the present is constantly emphasized, with past milestones appearing only later.
2. The content refers to current issues in the consciousness of the writer.
3. Updated posts appear regularly.

Blogs are not restricted by the physical limitations of pages and sheets of paper, and are not subject to editing instructions or other formal constraints. The content of the post is brief and usually focused on a single issue, presented in the format of ad hoc communication. The writing style is informal, consisting of short sentences with no distinction according to the nature of the content, be it technical, journalistic, or a description of a personal experience (Forster & Tam, 2004; Hourihan, 2002).

Blogs are an appealing means of learning, because of their ease of use and the possibility of adding content without knowing programming languages. As a simple-to-use application that is accessible and direct, the blog has become a very powerful instrument, capable of supporting personal and group learning. The ability to integrate a variety of multimedia applications and hyperlinks empowers the blog's contribution to the development of wide-ranging knowledge and cognitive processes (Downes, 2004; Minocha & Kerawalla, 2001).

In her doctoral thesis, Diane Hall (2008) listed four main advantages of learning blogs:

1. They help students be experts in the relevant field of study.
2. They increase motivation in the learning process.
3. They offer an innovative, interactive channel for participation in the learning process.
4. They provide a forum for diverse opinions and attitudes within and outside of the classroom.

Learning blogs offer students a voice in their own personal technological space (Ellison & Wu, 2008). They provide a technological platform for examining how the formal theoretical knowledge taught in class and the reading materials interrelate with the student's practical experience (Gray, 2008). In addition, the public nature of the writing increases the student's sense of responsibility for the learning process (Ellison & Wu, 2008).

Research conducted by the US Department of Education revealed that computer-assisted learning, and particularly learning blogs enrich the learning process, among other reasons because they enable students to channel the processes of interaction with the environment at their convenience and they encourage reflective processes, which promote improved learning outcomes (Means et al., 2009).

A salient concept in the present research is TD –Thinking Dispositions, which is broadly defined as tendencies toward particular patterns of intellectual behaviour. Perkins, Jay and Tishman (2009), advance a view of seven key critical thinking dispositions. Building on their triadic conception of disposition, they argue that each of these seven tendencies involve distinct sensitivities, inclinations, and abilities. The seven dispositions are:

1. The disposition to be broad and adventurous
2. The disposition toward wondering, problem finding, and investigating
3. The disposition to build explanations and understandings
4. The disposition to make plans and be strategic
5. The disposition to be intellectually careful
6. The disposition to seek and evaluate reasons
7. The disposition to be metacognitive

The Research Aim

The purpose of this research was to examine whether the blog environment fosters and promotes the utilization of TD. In examining the degree to which blogs contain evidence of thinking actions that characterize TD. The content analysis category was based on a rubric developed by the researchers, for the purposes of this study. The rubric was used as a basis for coding TD and their components in the learning blogs records.

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The Research Population & Instrument

The research population consisted of 25 master's degree students of education enrolled in a specialization track on computers and learning, who wrote weekly blogs throughout the course of an academic year (2010-2012). Writing the blogs was intended to be an integrative application of the courses that would create a professional identity and describe the student's learning process, experiences, and insights.

We conducted a quantitative content analysis of a sample of 25 learning blog posts students, with the purpose of identifying and characterizing TD. Systematic random sampling was used to select the posts and the coding and categorization were subjected to an inter-judge reliability test, as accepted.

Findings

Research Question 1: To what extent is it possible to detect incidences of TD representations the in the learning blogs?

The quantitative content analysis indicated that representations of TD were found in all the blogs.

The prominent TD in the records were: the disposition to be broad and adventurous, for instance:

> *"as soon as the students used their strengths, in their own playground, they felt safe, they had a clear goal, an immediate feedback…all these encouraged them to come up with convincing arguments, to present [them] in an original and convincing way" (Blog 11);*

and also the disposition to be metacognitive, for instance:

> *"when I write a post… I think of things I studied and notice the things that make me keep thinking, re-examining…" (Blog 24).*

Based on the findings, it can be concluded that writing a learning blog promotes significant utilization, in numerical terms, of TD (see Figure 1 below).

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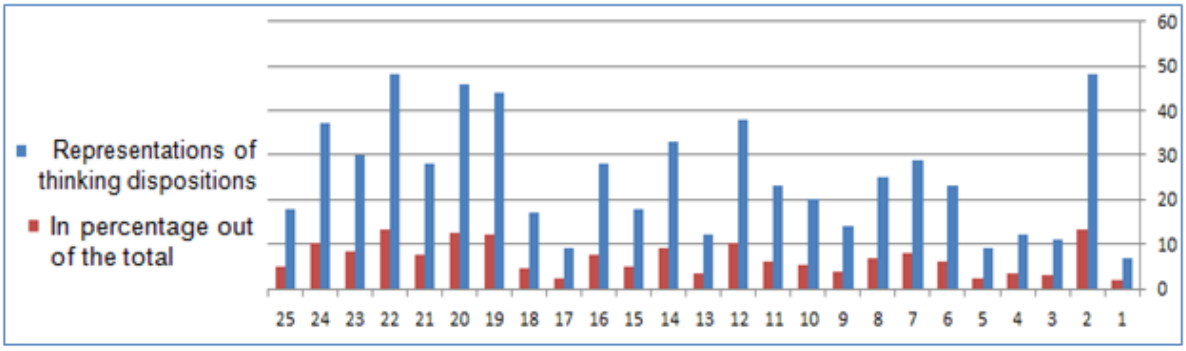

Figure 1. Representations of TD According to Blog

Research Question 2: To what extent do the learning blogs contain representations of a variety of TD?

As shown in Figure 2, in most of the blogs a variety of TD were utilized. Furthermore, in 94 % of the posts, the students used at least one thinking disposition, while the average TD in these posts was 6.6 TD per post.

In more than 50 % of the posts, at least 5 representations of TD were found.

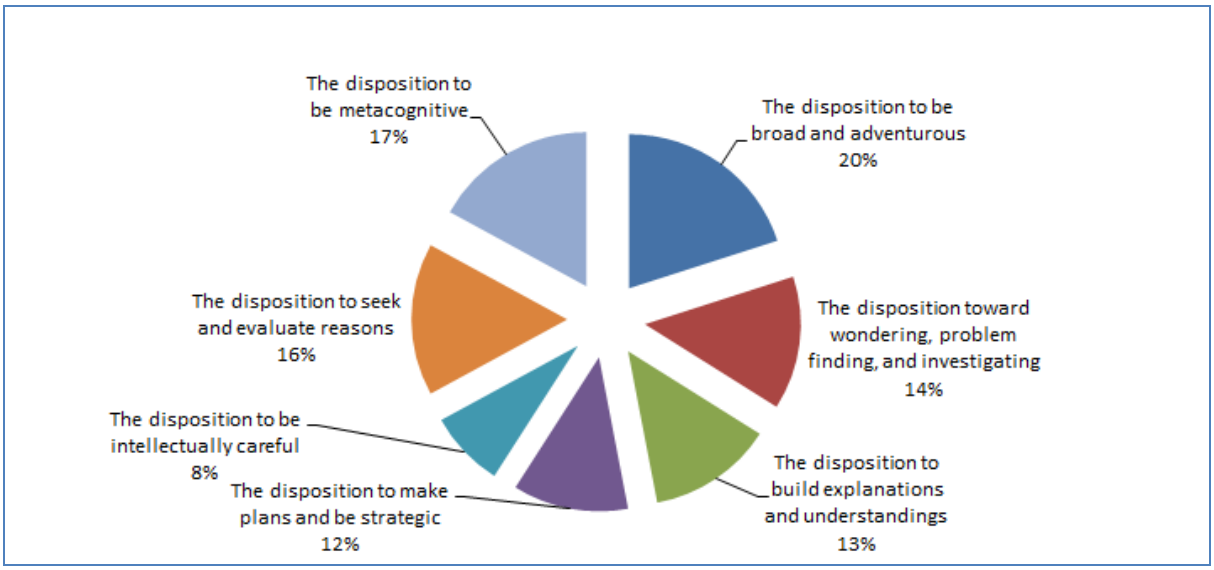

Figure 2. Variety of Representations of TD in a Single Record

In one of the posts which included the whole variety of thinking dispositions, the student wrote: "each post written by me every week was carefully planned and phrased accordingly. The wording was chosen after filtering and was frequently modified…the gradual critical thinking processes I went through and the feedback came up especially during the nights…" (An example of the disposition to be metacognitive representation) As well as, "the posts were written letter by letter, and they got their 'first sign of life' by reactions which served as a feedback for the log. Hurrah, someone read it!" (An example for the representation of the disposition to explanations and understandings)

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According to the findings, as illustrated in Figure 2, it can be concluded that writing a learning blog provides an opportunity for the representation of a variety of TD.

Research Question 3: To what extent is it possible to detect development in the scope of TD in the course of writing the learning blog?

In order to answer this question, we examined the blogs in their first period and in their final phase of writing. In the examination of the incidences of TD in the course of writing, the results showed an increase of 2.3 in the incidences of TD representations at the final phase of writing the blog, in comparison to the initial phase (see Figure 3 below). It indicates that the students used less TD in their early posts, with an upward trend in the representation of TD along the time axis. Thus, the findings reveal a positive development in the scope of use of TD in the learning blogs. This suggested that the learning blog encourages and contributes to an accurate and thorough thinking activity, independent inquiry, flexible and creative thinking and reflection processes which improve the quality of thinking and the products of learning.

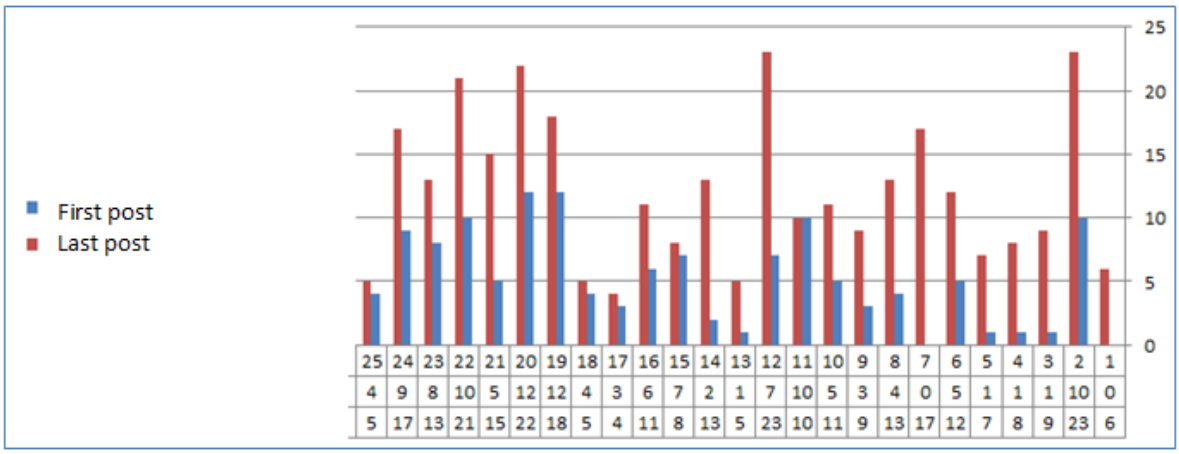

Figure 3. Incidence of TD– First and Last Record

Discussion and Conclusions

The present research examined the utilization of TD in blogs from a broad, process-oriented perspective of the blog throughout a period of writing of 18 months, the use of variety of TD and the possibility of an increase in the incidence of use of thinking dispositions.

In order to answer the first research question – "To what extent is it possible to detect incidences of TD representations the in the learning blogs? We examined whether TD are indicated in the learning blog. The examination of the blogs and the sample posts clearly indicated representations of TD in all the blogs. Finding evidence for TD in blogs such as the disposition to be metacognitive, and other dispositions, imply the development of critical thinking patterns, which contribute to a significant learning and for building a new knowledge (Kurtz, 2011), as well as that the new setting encourages the creation of new thinking functions (Ben-Amy & Chen, 2011).

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The second research question – "To what extent do the learning blogs contain representations of a variety of TD?" – examined the extent to which the students utilized a wide range of TD. It was found that almost in all the blogs a use of a variety of TD was made. More than that, in 94 % of the records the students used at least one thinking disposition while the average number of TD used in these records was 6.6 TD per record. In more than 50 % of the records, at least 5 representation of TD were found. The meaning of this result is that during the writing of the records in the learning blog, the students used a variety of thinking dispositions, significantly.

Thus it can be concluded that the active writing in the learning blog led to the expansion of the variety of use of thinking dispositions. In addition, it was found that the disposition to be broad and adventurous was the most common disposition. This result may suggest that the activity in the learning blog offers independent self-learning which necessitates open mindedness, attentiveness for narrow-mindedness, thinking of many possibilities and brain storming with peers. The results regarding the use of a variety of TD may suggest that the activity in the learning blog influences the dispositions and skills of the students in different directions: among other things, it completes or extends the dispositions (Ben-Amy & Chen, 2011).

The third research question was: "To what extent is it possible to detect development in the scope of TD in the course of writing a learning blog?" In other words, we sought to determine whether weekly blogging for a long period led to greater utilization of TD by the students with every post. The findings indicated an upward trend in the scope of utilization. The results present an extension of use of all seven measures of TD an increase of 2.3 fold in the incidence of TD representations at the final phase of writing the blog, in comparison to the initial phase. This suggests that the act of blogging, the weekly experience, and response from readers led to increased utilization of TD, as reflected in the posts.

Summary

The present empirical pioneer study was designed to examine the existence and increase in incidence of higher education student's TD in their activity in a learning blog. The research findings revealed that the learning blog contains representations of TD, in both large quantity and wide variety. In addition, a developmental process in the extent of TD representations can be traced in the learning activity. The blog can serve for an accurate and thorough mental activity, independent inquiry, flexible and creative thinking and its use encourages reflection. The results of the present study and those found in the study of Porat and Kurtz (2012) suggest that the learning blogs are indicative of a development of a qualitative thinking and thus can serve as a mean to promote the achievement of this goal.

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Limitations of the Research and Recommendations for Further Research

The present research was based on analysis of a sample of 25 (albeit representative) blogs. Consequently, it is not possible to generalize the findings of this single study to the entire world of learning blogs. More extensive research is required to verify the findings.

The present study is a case study, and as such, its results cannot be generalized to the whole realm of learning blog. More studies are required, in different learning contexts and among other learners' populations, in order to validate its results.

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*e*TANDEM LANGUAGE LEARNING INTEGRATED IN THE CURRICULUM: REFLECTION FROM STUDENTS' PERSPECTIVES

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Claudia Berger, University of Geneva, Switzerland, Ling Zhang, Hubei University, China

Introduction

Tandem language learning, as an original language learning approach, occurs when "two language learners with different native languages communicate with one another sharing the common objective of learning from each other" (Little, 1998). How to benefit most from this "ideal" language learning approach within this autonomous, reciprocal and collaborative learning context has been an interesting research question. Many language teachers and researchers have applied the approach formally or informally in their teaching and research practices, be it through face-to-face or any other modes of asynchronous or synchronous interaction (O'Rourke, 2007).

This article presents a summary of the findings of a three-year eTandem exchange course between two distant languages – Chinese and French at institutional level – between the Unit of Chinese Studies of the University of Geneva, Switzerland and the French Department of Hubei University, China. The summary focuses on the students' perspectives about the eTandem course. It is based on the data obtained from the pre-exchange survey of students' language profile and expectations for the exchange, from the formal yearly course evaluation administrated by the University of Geneva, from the statistics given by the students' logging on Moodle, as well as the face-to-face interviews with the students from both universities at the end of each academic year.

The project was initiated in 2009 by the Unit of Chinese Studies of the University of Geneva as an important part of the Chinese blended-learning programme called ChineWeb. It is still ongoing. The participants are, for each academic year, the second year language students from both sides (Level B1-B2 according to Common European Framework of Reference for Languages, 2005). The course includes theme-based asynchronous learning activities in the LMS Moodle as well as task-based synchronous oral communication via Skype.

The main objective is to promote autonomy in the language learning process in order to make the students aware of the importance of "learning to learn" as well as helping them to become responsible for their own language learning. The immediate objectives involve developing the

students' linguistic competence through communication with native speakers of the target language as well as getting them to better know and understand the target culture.

Socio-institutional context

The two universities share certain basic features in language teaching, such as the emphasis on the development of linguistic skills that include communication skills on similar topics. Compared to Hubei University, the Unit of Chinese Studies of the Faculty of Arts of the University of Geneva focuses more on developing the students' ability on learning and understanding Chinese society and culture, especially ancient and modern Chinese literature. The strength of the curriculum is thus laid more on reading and writing than on oral comprehension and communication. The 9-hour Chinese courses that the second-year students attend each week do not involve linguistic skills practice courses as listening and speaking. As a result, many students express a strong need for practicing what they learn in face-to-face instruction. Besides, the fact that some students take other optional subjects at the same time also prevents them from investing too much time on Chinese learning.

On the other hand, the training and the practice of linguistic competence come first in the curriculum of the French Department of the Faculty of Foreign Languages of Hubei University, especially for second-year students. However, they do not have many opportunities to speak French due to the great number of students in each class (25-30 per class). The opportunity to communicate with native French/Chinese speakers of their own age is undoubtedly a big attraction to students from both universities. In order to know exactly what the students expect to benefit from the eTandem exchange, we have collected information from a pre-course survey at the beginning of each year's course.

The results show that the benefits the students' expected from an eTandem exchange include improving oral communication skills, establishing a good friendship or a stable collaborative relationship with their language partners, exchanging cultural knowledge, and improving oral comprehension. Some also expected benefits in terms of vocabulary and grammar learning, as well as improving writing skills.

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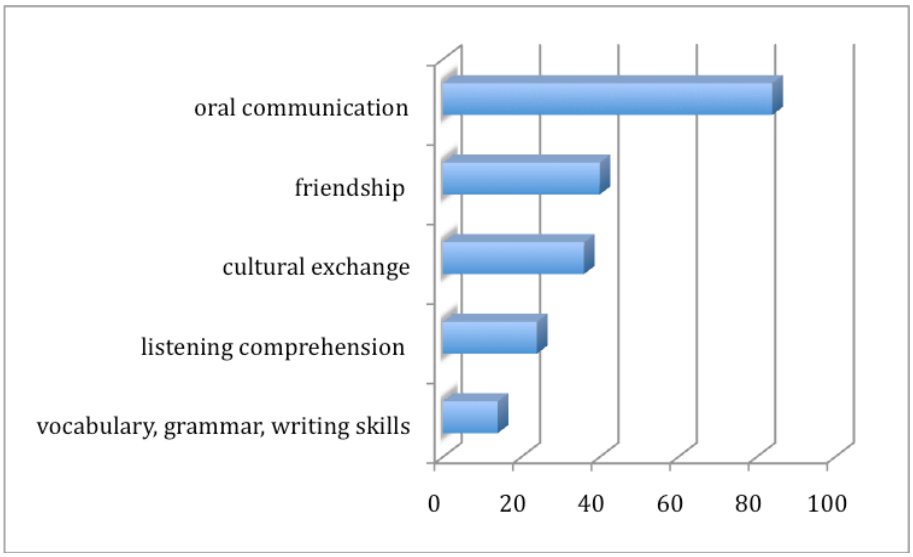

Figure 1. Students' expectations from the eTandem exchange (data from the surveys of 2010-2011, 2011-2012, 2012-2013)

The course structure

As a language practice course integrated in the whole Chinese blended-learning programme, the eTandem course has chronologically gone through different design cycles. Before launching a large-scale course, a pilot project was conducted between the two universities. Based on the students' feedback and the ergonomical analysis of the course feasibility, pre-course preparation, fixed course schedule, the bilingual course environment and online tutoring were kept to design the large-scale course that started in 2010. The courses in the year 2011-2012 and 2012-2013 have been iteratively redesigned on the basis of the analytical results of the former design so as to better adapt to the curriculum as well as to the students' needs.

Before the course began, all students were required to fill an online questionnaire to get registered. The survey included students' language profile and open questions about their expectations from the exchange. A face-to-face training session was organized by the teachers of both universities to help the students get familiar with the Moodle platform and Skype. As for the forming of eTandem partners, in the year 2010-2011, it was the teachers who matched the language partners. In the year 2011-2012, in response to the students' suggestions, this was replaced by a "tandem forum" where the students were encouraged to present themselves, to exchange messages and get in touch with each other through e-mails to find their partner.

Before each exchange, the students checked the task instruction for the session and consulted their partners' learning materials as a reference as to what extent they could provide aid during the exchange. There were 3 kinds of tasks for each theme, including: 1) a theme-based description or narrative task in the target language; 2) a question-answer discussion in both mother tongue and target language; and 3) a written summary of the exchange in their native language in the forum of each session. During the exchange, the students were required to strictly respect the principle of reciprocity: 30 minutes in French and 30 minutes in Chinese.

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The outcomes of the course

Data collections

At the end of each academic year, the students from Geneva were asked to fill in a formal course evaluation questionnaire administrated by the University of Geneva. A complete evaluation report was sent to the teachers directly afterwards. The evaluation form consisted of 4 parts with 12 5-scale questions about the course content and its organisation, teaching evaluation, as well as global appreciation, and 4 specific questions on the eTandem exchange, together with 3 open-ended questions about the comments or suggestions on the exchange. The questionnaire was translated in Chinese and was sent to Hubei University, where the data was then treated separately. Besides, after each weekly session of the exchange, the students were required to fill in a short self-evaluation form to report on the exchange process. And finally, an interview at the end of each semester was organized at both universities to collect students' comments on the course.

Students' global appreciation of the eTandem course

In general, the Geneva students' perceptions as whether they have achieved the objectives are overwhelmingly positive (see the graph blow, 100 % in 2010-2011, 100 % in 2011-2012, 97 % in 2012-2013). The result from Hubei University was not different from that of their counterpart.

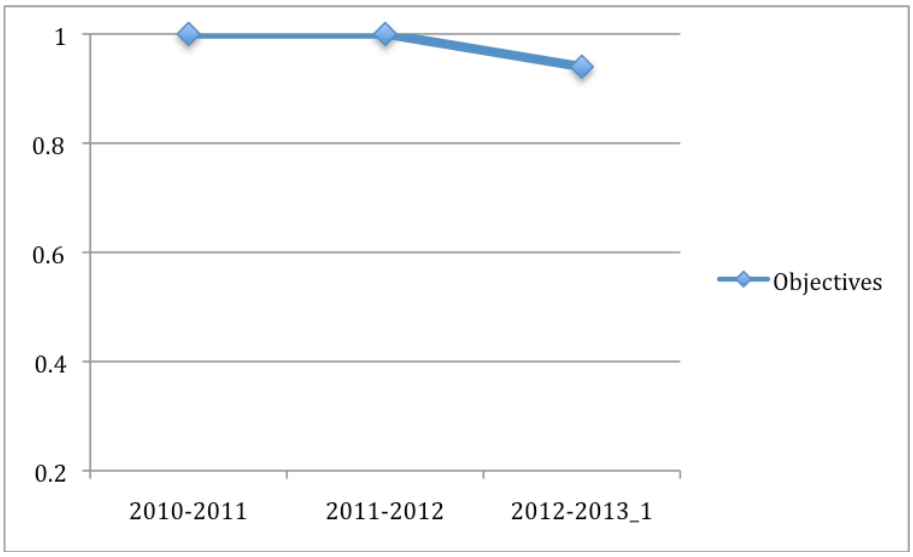

Figure 2. The attainment of course objectives (2010-2011, 2011-2012, 2012-2013_1) UNIGE

Despite a small drop in the year 2011-2012, the students showed their satisfaction with the eTandem course.

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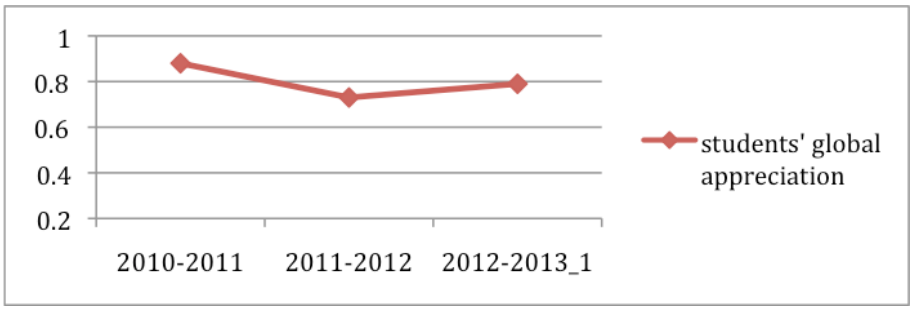

Figure 3. Students' global satisfaction with the eTandem course (2010-2011, 2011-2012, 2012-2013_1)

The obstacles

Technical problems were reported to be the biggest obstacle for a successful exchange. The breakdown of the Internet connection (during the academic year 2010-2011, the campus internet current was limited by the government, which was especially disastrous for the students of Hubei University), the cutting off of Skype, as well as other small technical problems discouraged the students from time to time. Besides, some students also regarded the preparation load to be a little too heavy and they demanded that the course materials be more related to their curriculum.

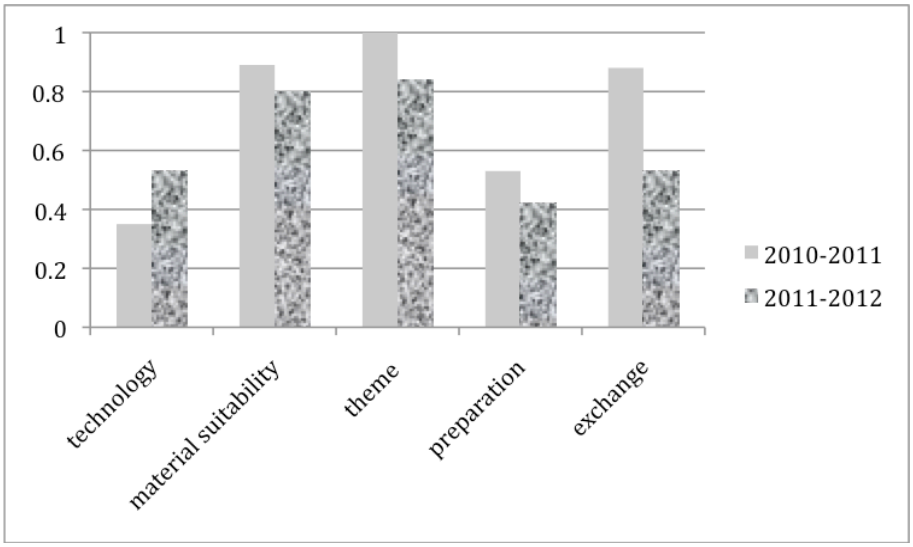

Figure 4. Students' satisfaction index with the eTandem course (2010-2011 and 2011-2012, UNIGE)

Do the benefits meet the students' expectations?

The students' perceived benefits included improving their speaking skills and understanding better the cultures. A lot of students noted the increased confidence in their use of the target language, as they were not afraid anymore of "speaking Chinese/French". The practice in the authentic target language with native Chinese/French speakers helped them to better know the target language as they were really put "in the bath" during the exchange. They also emphasized the precious experience of learning about the target culture through exchanging with people of their own age. As the statistics were completed by interviews with the students

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at the end of each year, we include below some of the students' commentaries regarding the benefits that they mentioned.

> *Ils permettent de mettre en place du vocabulaire en plaçant les mots dans un contexte. Ils nous donnent des structures/phrases utiles à l'oral. (The course helped to put the vocabulary into context. They teach us structures and sentences that are useful orally.)*

> *首先，交流区的区区比区灵活，便于我区自由安排；其次，可以与搭档区所欲言，能了解到很多区本上学不到的区西；最后，区彼此的口区水平和区区量都有很大的帮助。(First, the flexible exchange time helped us to organise our learning autonomously; second, talking with a language partner helped us to know a lot of non-book knowledge; last, it was really beneficial for the improvement of speaking skills and vocabulary learning.)*

> *平区在学校有很少的交流机会，区个交流区我区提供了平台，我区可以在区余区区区法区，和真正的法国人区法区，区能区区自己想区的区区，而不是局限于区本。而且可以区我区区区法区没有畏惧感。(As we don't have much opportunity to speak French at school, the course provided a platform for us to communicate in French with REAL French native speakers. Besides, we can talk about other subjects instead of being constrained by the textbook. We are no longer afraid of speaking French.)*

> *区区程区我区所学的区区和表达法提供了一个很好的运用的平台,帮助我区培养区法区的区区,加深了区国外文化的了解。(The course provided a good chance for us to practice the words and expressions that we have learnt. It helped us to develop a good habit of speaking French, and at the same time deepened our knowledge about the French culture.)*

Besides the linguistic benefits, almost all students mentioned the enthusiastic experience of the cross-cultural exchanges they had with their partners. For one Swiss student, the Chinese students were no longer "*OVNI*" (UFO) since he got a lot of information about Chinese culture "en live" (on live) with a "vrai Chinois" (real Chinese). The course was "grammaticalement et humainement intéressant" (grammatically and humanly interesting).

Most students felt that their partners "*aident vraiment à nous ouvrir et progresser*" (really help us to open up and make progress), that they mutually gained more confidence in oral communicative skills.

Parts of the students' perceptions were actually quite accurate as the final results of the oral test showed a clear improvement in the development of their speaking skills, especially pronunciation, higher confidence in their use of the target language and a greater knowledge

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of the target culture. However, more evidence is needed to prove the relation between these improvements and the eTandem exchange.

Students' participation in the forums

The statistics extracted from the Moodle LMS also showed the students' active participation in the online course, especially the posts in the forums opened for each session. After each exchange, the participants were encouraged to write a summary of the exchange in their mother tongue for their language partners. In the year 2011-2012, most students did not understand the real benefit of this task and they mentioned that during the interview. We thus emphasized the importance of the feedback-summary in the pre-course training. As a result, the messages that the students posted almost doubled during the first semester of the year 2012-2013.

Table 1: The comparison of students' posts in Moodle forums (2011-2012, 2012-2013_1)

Academic year	**2011-2012**	**2012-2013_1**
Students number	82	99
Total student post number	401	955
Average post per student	4.9	9.6

The students not only resumed what their partners said during the exchange, they also added their own comments concerning the cultural information that they had learnt during each session, their personal feeling about their partners and the exchange process.

By exchanging about cultural topics they get to know each other, understand each other, share the same point of view or become open to different opinions with less bias.

> *在瑞士，很多学生都是靠自己打工来支付所有的开⊠。(In Switzerland, many university students work on their own to pay for all the daily expenses.)*

> *⊠到怎⊠保⊠⊠境的⊠⊠⊠，我才⊠⊠Sara是个很⊠⊠大自然的人，她作⊠一个志愿者加入了一个保⊠⊠物的机构,她自然和人类都是⊠相互尊重的。 Sara真是个⊠人喜⊠的女孩！ (When talking about environmental protection, I found out that Sara was a nature-lover. She joined an animal protection association as a volunteer; she thought that nature and human being should respect each other. She is really adorable!)*

> *我⊠都⊠得没必要花⊠玩网⊠游，⊠⊠⊠花在更有价⊠的地方。(We both agreed that money should be spent on something more worthwhile than on playing video games.)*

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> *□次□□，我从James身上了解了很多巴黎人的日常开□以及他□□待奢侈品和中国人□待奢侈品的或相同或不同的□度，我受益匪浅！(In this exchange, James let me know how most people in Paris pay for their daily expenses, and the different attitudes towards luxury products between the Chinese and the French. I've learnt a lot!)*
>
> *Elle m'a appris l'adage: le matin, manger comme un empereur, à midi manger comme un homme ordinaire et le soir manger comme un mendiant. Je suis donc un mendiant du matin qui devient empereur le soir! (She taught me a Chinese saying: Eat breakfast like an emperor, lunch like a king, and dinner like a beggar. I'm a beggar in the morning and an emperor in the evening!)*
>
> *Selon l'expression, 'les voyages forment la jeuness', il est vrai que les voyages en solitaire permettent de prendre confiance en soi et de pouvoir prendre les bonnes décisions. C'est une bonne occasion pour apprendre à se débrouiller seul. (According to the expression, "travel broadens the mind", it is true that travelling can help to gain confidence and to be able to make good decisions. This is a good opportunity to learn to be independent.)*

The joyful learning experiences enrich their vocabulary, especially the proverbs.

> *Je remercie beaucoup mon etandem Fanny qui me fait mieux connaître la Chine et qui m'apprend des nouveaux mots et a beaucoup d'humour. (I am very grateful to my tandem Fanny who helps me to know better China and who teaches me new vocabulary with a lot of humor.)*
>
> *Elle m'a appris une expression pour parler des gens qui, contrairement aux gens qui voyagent, ne connaissent pas grand chose: 井底之蛙. (She taught me an expression to describe people who, contrary to those travel a lot, know nothing about the outer world: a frog at the bottom of the well.)*
>
> *A propos de Guilin, elle m'a appris une expression disant que les paysages de Guilin sont les plus beaux du monde: 桂林山水甲天下. (About Guilin, she taught me an expression to say that the Guilin landscapes are the most beautiful in the world: East or West, Guilin landscape is best.)*

A pleasant collaborative friendship was also established step by step as the course progressed.

> *我□互相了解，互相帮助，互相学□，□正聊天中的□□。我□得能有一个互助的伙伴是一件很好的事情，很期待下次的交流。(We tried to understand other, to help each other, to learn from each other and correct each other. I found it wonderful to have a helpful partner. I'm looking forward to our next exchange.)*

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> *Elle parle très bien français et elle me corrige quand je fais faux. C'était très sympathique de parler avec elle et je pense qu'on va devenir de bons amis. Trop cool / 太酷了! (She speaks very good French and she corrects me whenever necessary. It was very nice talking to her and I think we will become good friends. It's really cool! /Too cool!)*
>
> *Elle m'a corrigé mon chinois avec beaucoup de patience. J'ai eu des scrupules à raccrocher après 1h de conversation avec une personne aussi adorable! (She corrected me with a lot of patience. I was reluctant to cut the conversation after talking for one hour with such an adorable person!)*

The teachers felt very happy to read the high-spirited posts written in the forums week after week. Another proof of the success of the exchange was found in the fact that several students from the 2010-2011 academic year reported keeping contact and continuing exchange with their partners even after the course. They decided their own learning objectives, chose the topics they felt like discussing, and tried to get the best from the exchange with their language partners.

Future work

Undoubtedly, the Chinese-French eTandem course has brought great benefits to the students, not only linguistically, but also culturally. We will continue this course with a more adaptive design according to the students' feedback. A solid partnership between the University of Geneva and Hubei University is vital for the success of this Chinese-French eTandem exchange project. Taking into consideration a long-term collaboration, the future work will focus on finding a solution to the technical problems as well as "normalizing" the course (O'Dowd, 2010) in Hubei University. Among others, research questions like how to evaluate the oral exchange, how to foster students' learner autonomy for their future language learning remain to be solved in the long run.

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A PERFECT ICT COURSE FOR OLDER LEARNERS – FINDINGS ABOUT FAVOURED ICT COURSE CONCEPTS OF OLDER ADULTS

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ICT and older adults

When it comes to using information and communication technologies (ICT) on a regular basis, older adults in Germany and also in other European countries are still underrepresented compared to younger age groups. In Germany, 60.4 % of adults between 60 to 69 years were using the Internet in 2012 and only about 28 % of older adults above 70 years used the internet regularly. Notably, in old age there is a yearly increase of internet users of 3 % or even more (Initiative D21, 2012). However, among young adults there are more than 90 % internet users and even in the group of middle-aged adults (40-59 years), 77 % to 88 % use the internet. Generally, higher educated persons, men and persons living in urban areas use the computer more often as compared to lower educated persons, women and people from rural areas (Forschungsgruppe Wahlen, 2012, Initiative D21, 2012). Typically, when older adults begin to use ICT, there are many positive consequences: For example, older users benefit from social aspects of ICT, new opportunities of information seeking, and easy availability of information (Gatto & Tak, 2008).

Of course, new users need to invest time and effort in learning and practicing the use of PC and internet. Persons, who keep using the PC, seem to have several benefits. In a study of White et al. (2002) new users showed, compared to a control group, trends towards more autonomy, less loneliness, and depression and a more positive attitude towards computers. The use of internet and e-mail also seems to have a positive effect on quality of life, mainly because of the new opportunities for social interactions and older adults rate their own age more positive than non-users (Schweiger & Ruppert, 2009). Another important benefit is that persons who use the PC and the internet are also more likely to use other technologies like ticket machines, electronic cash or mobile phones. Technology use also correlates in this study with a high activity level in general and a perceived higher locus of control (Tacken, Marcellini, Mollenkopf, Ruoppila & Széman, 2005). This means that the technology users feel more in control of their own lives and more autonomous. But before older adults can profit from these benefits, they have to learn how to use computer and internet.

ICT courses for older learners

Not much is known on how older adults acquire knowledge of ICT use. In a US study with older learners, approximately 50 % said that they mainly taught themselves how to use the internet. 34.5 % said that they had (additional) help from a relative, 22 % by a peer and 21.5 % took a class to learn how to use the computer or the internet (Eastman & Iyer, 2004). When it comes to organized computer learning, three possibilities exists: face-to-face learning, e-learning and blended learning. Face-to-face learning courses are the most common form of learning ICT skills in older age, e.g. a lot of German adult education centres offer face-to-face courses in the field of ICT learning specifically for older adults (Reichart & Huntemann, 2008). These are mainly typical classroom teaching formats with a teacher who explains step by step and participants who try to follow the instructions. Electronically supported learning (e-learning) means that electronically or digital media is used for the presentation and/or the distribution of learning material or is used for communication between the learners and teachers (Kerres, 2001). This is a very self-regulated form of learning and everything can be accessed from home and in own speed and time. Blended learning is a combination of both learning forms. Only few studies have explored e-learning or blended learning contexts of older adults. For example, Hernández-Encuenta, Pousada, und Goméz-Zúniga (2009) reported that older adult learners participated in e-learning courses for several reasons such as interest in the topic, joy of learning, as well as seeking to feel like an active member of society and to actively engage in new media und that e-learning can be a good teaching method for this group. Chu (2010) also found evidence for positive effects of e-learning classes among older adults. The study of Stoltz-Loike, Morrell & Loike (2005) showed that older adults use very successfully e-learning material to learn a new computer program, especially because e-learning can offer a lot of training tasks and tests as part of its material. Also in a study of Trentin (2004) benefits of ICT learning for older adults by learning purely online were found, however he states that in the beginning of learning ICT face-to-face meetings would be helpful. Of course older learners have somewhat different needs than younger learners. Regardless if the course is online or face-to-face, social motivation is salient among older adults, that is, social contact with teachers or other participants is preferred. Older adults express personal growth motives, this means, they are more intrinsically motivated for the course topic per se and have a strong interest in learning (Kolland, 2000). Competition and comparison with other participants and instrumental motives are less relevant for older than for younger learners (Leen & Lang, 2013). This already gives some information about important aspects of an ICT courses special for older learners. Also Hetzner and Held (2009) stated that communication possibilities should be implemented in every course, like forums and chats in online courses. Beside of these aspects, not much data is systematically collected about the needs and desires of older learners. Therefore an exploratory study with experienced ICT course learners was conducted to find out more about the needs of older learners in ICT learning. In a preliminary mainly qualitative study, questions about ICT course design and formats were asked.

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Main research questions were:

- Which course formats do older learners favour to learn how to use ICT?
- Which support activities and teacher qualities are needed?
- What problems do older learners face during ICT courses?
- Which aspects are most important to design good ICT courses for older adults?

Study Method

Respondents

219 former participants of e-learning and face-to-face ICT courses received an e-mail with an invitation to participate in a short online survey. All participants were older adults; they already participated in an earlier study and were experienced participants of ICT courses. Of 219 older adults, 32 filled in the questionnaire which is a response rate of 14.6 %. 6 persons were excluded afterwards because they did not answer all open questions. Of these remaining 26 older adults 14 were male and 12 were female. Table 1 gives an overview of characteristics of study participants. Mean age was 69.5 years (age range 52 years to 83 years). Men were about 1 year older (M=69.9 years, SD =5.80) than women (M = 69.0 years, SD = 7.75). Men were higher educated than women, but for perceived computer handling skills, no gender difference was found.

Table 1: Description of Study Participants ($N = 26$)

	Male participants (n =14)	**Female participants (n =12)**	**Sig. (chi^2; df)**
Education level (in %)			
Less than 10 years	16.7 %	21.4%	$\chi^2 = 15.14$, $df = 3$, $p = .002$
10 years	50. %	14.3 %	
More than 10 years	33.3 %	64.3 %	
Computer handling			
Very insecure	0 %	0 %	$\chi^2 = 1.06$, $df = 2$, $p = .588$
A little insecure	33.3 %	21.4 %	
Quite secure	58.3 %	57.1 %	
Very secure	8.3 %	21.4 %	

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Measure

Respondents answered five open questions about the optimal design and course format of an ICT course, about qualities of a good ICT teacher, about differences between older and younger learners, about perceived ICT problems and about their personal motivation to attend the last ICT course. The mean of used words in the five open questions together was 154.46 words (SD=76.16). The length of open answers was not influenced by education. This data was analyzed with MAXQDA, a program for computer based content analysis. In this research a deductive method was used (Mayring, 2007). Based on the structure of the open questions, categories and subcategories were built. Additionally, multiple choice questions about the importance of several course aspects were asked and also demographic questions like gender, education, age and computer skills.

Procedure

Respondents received an e-mail with an anonymous link to the survey site. It took participants approximately 15 minutes to fill in the online survey. First it was assessed if persons did participate in an ICT course during the last five years, if not; the survey was finished for this person. Multiple participation was also controlled and if participants filled in more than one questionnaire the first complete questionnaire of this person was chosen and other questionnaires were deleted. The survey stated with the open questions and participants were encouraged to answer questions as elaborated as possible. After that the multiple choice questions about the importance of course aspects were answered and the questionnaire ended with demographical questions. Because participants should not be influenced by the list of aspects of ICT courses, this part of the survey was only visible after filling in the open questions. Answering all questions was compulsory. After four weeks the survey was closed and the qualitative data was exported to MAXQDA and the quantitative data to PAWS statistics for further analysis.

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Results

Qualitative analysis

The qualitative analysis is based on five open questions. Codes and sub codes which could be extracted from the data are displayed in Figure 1.

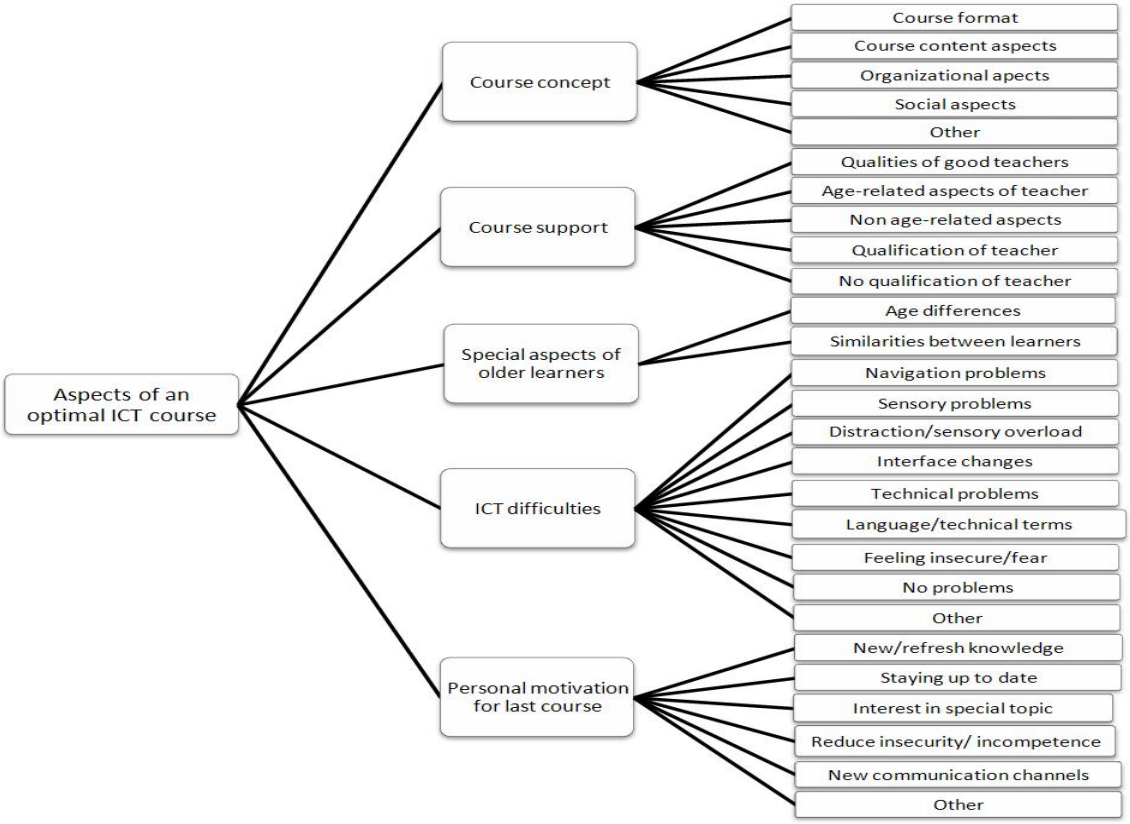

Figure 1. Overview of the coding system of qualitative data

Regarding course concepts, answers can be split into comments about course format, content, organization and social aspects. Based on the frequencies of mentioned aspects, it can be said that social interactions were very important to the participants; many of them mentioned the need of interaction with other participants and with the teachers, even when they would favour a purely online based course. Also many organizational aspects were noted; regarding this aspect mainly the need for informative feedback and (self-) tests were mentioned, participants have the need to know more about their own progress. Also sustainability (e.g. the possibility to look things up at home in a course book or on CD-ROM) and the need for easy understandable instructions and language were often noted. Many of them would favour blended-learning or e-learning formats, mainly because of the possibilities to learn in their own time and to rehearse and practise as often as needed. About teachers or tutors of ICT courses, main answers were that formal education and age of the teachers is not so important but that mainly empathy and patience are qualities a good teacher should have. Also good knowledge and the ability to explain ICT terms in easy language and without too many

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technical terms were mentioned by many participants. All participants also agreed on the fact that there is a big difference between younger and older learners in ICT courses. Three main reasons were brought up here. According to the older participants of the survey, for young adults the use of ICT is self-evident, younger learners learn faster and easier and older adults have more fears towards technologies and are more timid in trying out ICT. When asked for perceived ICT problems, seven different problems were mentioned by more than one participant. Most often confusing technical terms and English terms were named to be a big problem, but also problems due to sensory overload or distraction were often mentioned. Older users get distracted by pop-ups or spam easily or lose track when surfing online. Another big problem is the fear of deleting something unintentionally or readjusting something unwillingly. Furthermore technical problems which are inexplicable to the user and navigation problems are feared. Some people also indicate problems when handling the key board or problems due to fast changing user interfaces due to software updates. Only three persons said they did not have any ICT problems. When asked about their main motivation to attend their last ICT course, five main reasons were found. Many people wanted to gain new knowledge about the ICT area in general or refresh their general knowledge. Only five persons had a very special purpose in mind like learning how to use a specific computer program. Also many participants wanted to stay up to date and stated that it is obligatory nowadays to know at least some basics about ICT. Another important point is the reduction of insecurities and incompetence and start to dare to try things out on a computer.

Quantitative analysis

Furthermore, we gave participants a list with 15 aspects, which might be relevant for a successful ICT course. All aspects received ratings between 3.35 and 4.73 on a five point scale. This indicates that all aspects are quite important to the learners, although some aspects are significantly more important than others. In figure 2 all aspects are displayed. There was a significant difference between some of the aspects. To test if some aspects were significantly more important than others, the aspects with the highest scores were compared with the rest. 'Quick feedback from the tutor' and 'rehearsal possibilities' which both scored 4.73 on a five point scale did not significantly differ from 'sustainability', 'exercises' and 'practical examples'. All other aspects differed significantly, indicating that these aspects were less important to the course participants. Interestingly all very high rated aspects have something to do with organizational aspects of courses and not with social or content aspects.

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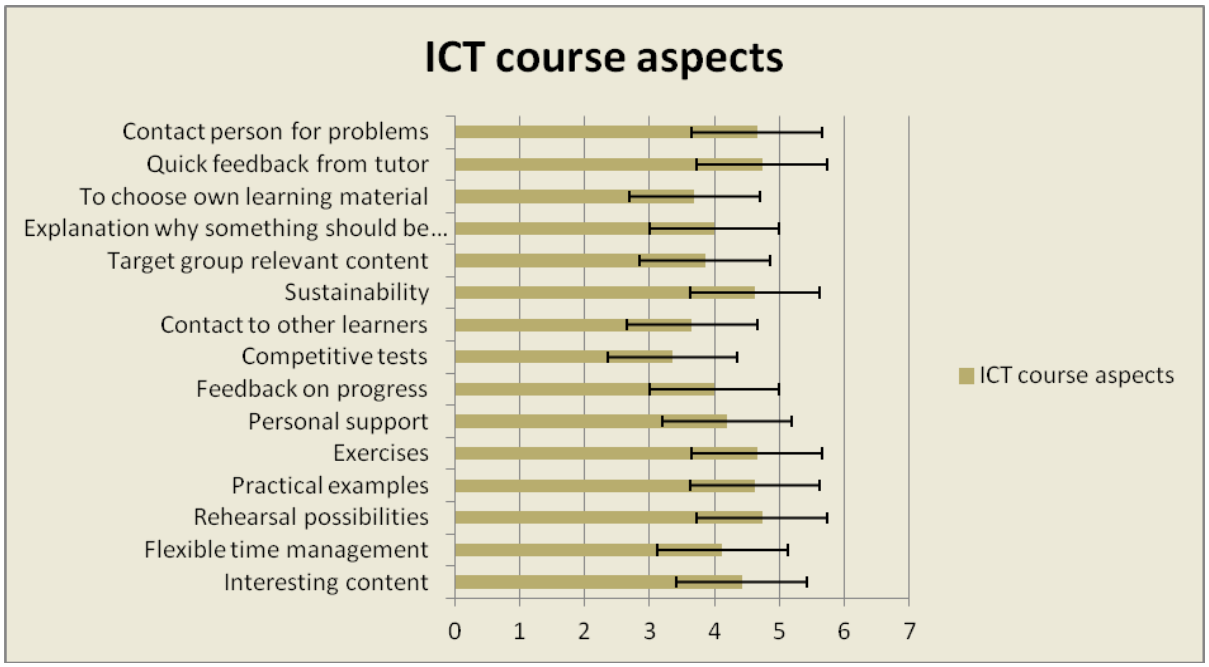

Figure 2. Ratings of different ICT course aspects

No differences were found between male and female participants. Furthermore, educational differences were tested in an ANOVA. An education difference was found for the aspect 'feedback on progress' ($F_{(3, 22)} = 6.28$, $p = 0.006$). People with 10 years of education rated this aspect as less important than persons with lower or higher education. Also computer experience made a difference on this aspect ($F_{(2, 23)} = 10.88$, $p = 0.001$). The higher computer experiences were rated, the higher was the importance of this topic valued. Also the aspect 'explanations why something should be learned' was influenced by computer experience. People who feel a little insecure when using ICT rated this aspect as significantly less important than the other more secure groups ($F_{(2, 23)} = 4.40$, $p = 0.024$). Persons with more computer experience want to know more specific where they stand and why they should learn something, this indicates that more experienced users want to learn more self-regulated.

Discussion

Our exploratory study allows for a preliminary understanding of what are the needs of older learners in ICT courses. It seems that many older adults favour online or blended learning over other learning contexts because of the possibility to rehearse and practice at home in a self-determined learning speed and time budget. However, social interactions with other participants and teachers seem to be important to them, no matter what kind of course they prefer. This is something which was already found in previous studies, showing that the motivation of older learners on social course aspects was higher than social motivation of younger learners (Leen & Lang, 2013, Kolland, 2000). Participants seem to have a precise understanding of how a course should be organised to fit with their needs. For example it is very important to them to get individual feedback or test their new knowledge and monitor their own progress. Whereas comparisons with other learners or competitive tests are not

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important to most learners and also in the multiple choice questions, 'competitive tests' is the aspect which was least important. This is not very surprising as research shows that competitive behaviour declines after the age of fifty (Mayr, Wozinak, Davidson, Kuhns & Harbaugh, 2011). Therefore, this aspect should not play a big role in courses for older learners. Also sustainability and easy and understandable language were often mentioned in the open questions. This also goes in line with the quantitative data, where also quick feedback, rehearsal possibilities, sustainability, practical examples and exercises were the most important course aspects. In this quantitative list, the point 'understandable and easy language' seems to be missing, an important point which should be considered more when creating courses, as these open answers demonstrate. Regarding teacher characteristics, empathy and patience is very important to many older learners. And also at this point understandable explanations are mentioned again quite often. Age and formal education of the teacher only play a very minor role as long as the chemistry between teacher and learners is good. As many learners enjoy the learning process itself, have more experience- oriented motives and are not interested in formal qualifications (Kolland & Ahmadi, 2010; Kolland, 2000), these aspects are not surprising. Also the problems older adults face and the perceived differences between younger and older learners do not come as a surprise. In studies of Schweiger and Ruppert (2009) and Gatto and Tak (2008) also problems regarding general fear to do something wrong, sensory problems and frustrations with distracting elements like spam or pop-ups and are mentioned. However, the problem of misunderstanding technical terms and English terms and navigation problems were not mentioned in these studies.

Limitations of our study pertain to the small and selective sample of old and ITC-experienced participants. As a matter of study, we interviewed people who already had some experience with ICT course formats and thus were able to express their experience and unfulfilled needs in such courses. Considering our qualitative approach, the sample size seems sufficient to allow for tentative insights on how ICT course can be adequately designed for older learners. Future research may benefit from more systematic qualitative studies with elaborated interviews as well as from experimental studies in which learners participate in various course formats and then rate their satisfaction and learning success. Another limitation is that participants already followed ICT courses before but that we do not know which course format they visited and it might be that many of them only had experience with one specific course format. It was only assessed that they participated in at least one course during the last five years but not if it was an online, a face-to-face or a blended learning course. In further studies this problem should be considered more deliberately.

However, as not much research has done so far about designing ICT courses for older learners, this preliminary study is a first attempt to get some insight in the needs of older learners. As research shows, the use of ICT has many benefits for older adults and adults who start using ICT are very satisfied. Therefore it seems very important to promote the use of ICT and especially the development of good course concepts as nearly all older adults who do not use the computer yet will need some training to become a regular and satisfied user. To

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provide older learners with perfectly suited trainings and courses it is necessary to ask the experts in this field directly, namely the older adult ICT users and course participants, what they need and expect in an ICT course.

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ONLINE LEARNING FOR STUDENTS FROM DIVERSE BACKGROUNDS

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Introduction

The advantages of an online science education course to pre-service students from diverse backgrounds are presented in this study. In light of the importance of online learning as a teaching tool, an ongoing five-year study was designed to face the challenge of adapting a course for three groups of students from diverse backgrounds; students with learning disabilities (LD), excellent students and regular students. The "Science Education" on-line course 'was part of the teacher-training program for K-2 pre-service teachers which focuses on constructing a science teaching unit and was based mainly on learning scientific concepts, including fostering lab skills, and practicum. Adapting a science education online course by using information and communication technology following formative assessment was a challenge for students from diverse backgrounds, with different needs and capabilities as well as for their lecturers. The study will describe the attitudes of students towards the online course and the way it dealt with the challenge.

Accessibility of online learning

Bonk (2009), describes the availability of education from anywhere at any time with computers and Internet access. Although during the last twenty years or so, studies focusing on the integration of ICT in teaching claimed on the old pedagogy, teacher and student lack of knowledge of technology, and hardware limitations (Chazan, 2001; Goldstein et al., 2011). During this time new technology-based teaching methods and processes have been developed and incorporated in active learning processes (Venezky & Davis, 2002). Additionally, a great number of researches on the appropriateness of the learning styles (Fuller, Norby, Pearce & Strand, 2000), and the characteristics of students to fit online courses have been made. Still, there are no conclusive answers as to the nature and extent of the impact of online learning to diverse background students. Researchers agree that students taking online course are required to possess self-learning abilities, maturity and high self-discipline, high motivation, the capability of expression and communication in writing, time organization skills as well as the ability to manage an online learning environment (Trentin, 2002). Furthermore, Cavanaugh's et al (2009) review of the literature pointed to greater improvement in critical thinking, researching, use of computers, independent learning, problem solving, creative

thinking, decision-making, and time management skills of online students compared to their counterparts in traditional classroom settings. Unsurprisingly, the online learning environment poses some challenges to student learning as well as numerous benefits. The challenges most often reported in the research literature generally fall into two broad categories: challenges due to a mismatch between students' specific learning style preferences and the online learning environment, and challenges in communication. With respect to challenges due to a mismatch between students' specific learning style preferences and the online learning environment, they suggested that in an online environment, extroverted students may miss the face-to-face interaction with peers, and students who do not have strong verbal/reading skills may experience a disadvantage in a text-heavy online environment.

Policies to promote widening participation, benchmarks and incentives to recruit students from more diverse backgrounds and those with disabilities have led to a doubling of the declared number of students with disabilities entering Higher Education over the last 10 years (Higher Education Statistics Authority, 2006). Counterpart to the students from diverse backgrounds, are the Excellent students who belong to an Honours Program and are an integral part in Higher Education.

Students with learning disabilities

Students with learning disabilities (LD Students) might be affected by a group of disorders that affect the ability to acquire and use listening, speaking, reading, writing, reasoning or math skills (National Center for Learning Disabilities, 1998). Profiling individuals with LD is not easy because the most cited characteristic of this group is that each individual is unique. However, despite the diversity, most individuals with LD share some common patterns of behaviour. Technology allows students to be self- directed, self-paced, and the possibility of reiteration, giving instructors the necessary tools to organize and deliver content into well-defined teaching systems and expand the learning process by providing activities such as discussion forums. In addition, electronic texts offer many advantages over print-based materials for students who learn in a web based environment O'Neill (2001). However, for students with learning disabilities these advantages were not expressed (Kwesi, 2002). Simoncelli and Hinson (2008) used Universal Design for Learning (UDL) methods that can be used for all students, including those with learning disabilities, and included how proper use of UDL can benefit these learners in the ever changing online learning environment. The findings reflected no apparent differences between the two students with learning disabilities and three without disabilities in regard to the use of instructional media. Similarly, Brunvand and Abadeh (2010) review a variety of tools and techniques that teachers can use to help make online learning more manageable for students with disabilities.

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Excellent students

The Excellent students are part of the Honours Program which is a selective and demanding program for the College's best academically qualified and most highly-motivated undergraduates. Admission is selective and designed for pinpointing the top 10 % of all students, based on their acceptance performance and a personal interview, psychometric exams (SAT equivalent) and potential. The principles of excellence, which were conducted in an American report (NLCLE, 2007), offer both challenging standards and flexible guidance for an era of educational reform and renewal. It is a selective, demanding, and rewarding program for those seeking an intellectual challenge and who are prepared to invest the extra effort required to meet that challenge. Thomson (2010) states that online programming can be an effective means of meeting the needs of many *gifted students,* based on in-depth qualitative and quantitative investigation of the perceptions and experiences of gifted students and their teachers on courses offered through an online program designed specifically for *them*. Students were able to work at a pace consistent with their rate of learning, had more time to reflect, to feel more in control of the learning process, and to engage in more self-directed and independent learning. An online course, as well, is one of a general course enabling learning in heterogeneous groups made up of excellent students, students with learning disabilities, and regular students (Ronen & Shonfeld, 2008).

Online science education course

Science plays a key role in preparing K-2 pre-service teachers. Nonetheless most of them are reluctant to get involved in science (Ashenhaimer, 2001). Furthermore, students' difficulties in science and technology accompany them since high school. The question of quality and comparability of online learning naturally arises, mainly in relation to workshop courses based on labs, which are typically F2F oriented. Trying to enlighten the advantages of online labs for diverse background pre-service teachers, Ronen and Shonfeld (2006) designed an online course which is based on hands-on labs. The online course challenges the attempts to promote science instruction and foster student- teachers' lab skills. In addition, the online science education course provides a model to follow in the field.

The purpose of this study was to examine the extent to which an online science education course works for diverse backgrounds pre-service students including students with learning disabilities excellent students and regular students.

Methodology

The purpose of this study was to examine the extent to which the online course "Science education for K-2" is the appropriate learning environment for different learners – "Special", "Regular" and "Excellent", in these aspects: (1) The contribution of the online course for learning, (2) the degree of coordination between online tools for learning, (3) the degree of interaction between participants in the course. Student attitudes toward the degree of coordination between the various online courses using combination methods were tested in a

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quantitative and qualitative research. Data was collected through attitude questionnaires distributed to all students attending a course, and through interviews with some of them. The quantitative findings allowed comparison between groups of students and helped us to interpret the attitudes of students and to match the online course interests and abilities as is customary in qualitative research. Thus the findings articulated course matching learners, as it was perceived by them.

The study

The study population included 121 students in their second and third year in the Early Childhood program: participants in the online course "Science Teaching for Early Childhood", between the years 2004 to 2008, 25 "special students" (with learning disabilities), 28 "excellent students" (belonging to the program specified), and 68 "regular students" (not affiliated as special or excellent). Every course included students from all three groups. Each year about twenty seven students attended. Two students of the population belonged to the Excellent and Special populations, and were classified as Special in this research. All courses were taught by the researchers. Research tools included pre-questionnaire, post-questionnaire and interviews.

Findings

The contribution of online learning course has been reviewed several aspects:

1. Students' self-learning ability and participation in the online course;
2. Students' satisfaction of the online course activities and skills;
3. Suitability of online environment for learning;
4. Online course interaction;
5. Online course affordances;
6. Online course Students' achievements.

Students' self-learning ability and participation in the online course

Figure 1 shows LD, 'Regular' and Excellent students' evaluation of their self-directed learning abilities level. As can be seen in the PRE questionnaires the LD students reported on lower levels of self-directed learning (3.25) in comparison to the 'regular' (3.3) and excellent (3.6) student-teachers. However, in the POST questionnaire they reported on higher (3.75) levels of self directed learning in comparison to the others. The biggest improvement can be seen in the LD students' evaluation.

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The interviews clarified the online course's contribution to the students' self-learning ability as an LD student, N, said:

> *"In the online course I needed to learn independently, all by myself, at first I had difficulties in information processing, but I had to manage, so I overcame. I managed in-time planning, I learned to take responsibility and I feel much more self-disciplined."*

The excellent students also described the online course's contribution to their self-learning ability as A said:

> *"Although I am a self-learner and I know to learn by myself, I mainly learn from my lecturer in a traditional lesson. The online course contributed to my self- learning skills, responsibility and time planning."*

And a regular student, T, claimed that:

> *"self learning is a necessary condition for online learning, students who need to see and hear their lecturer can't be online learners."*

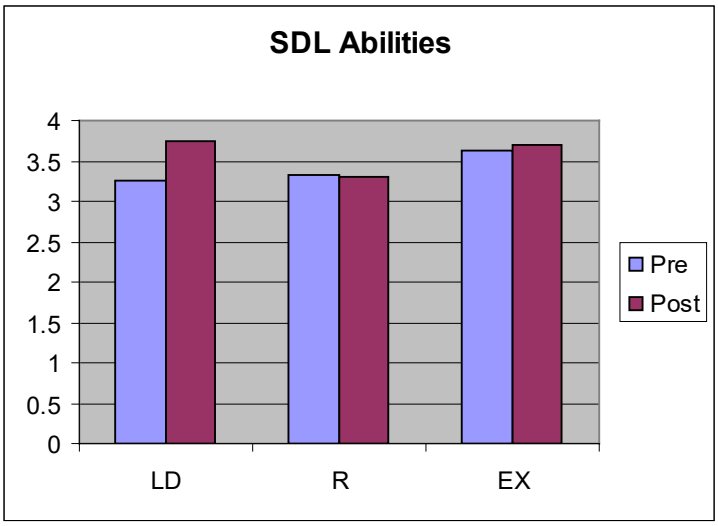

Figure 1. Pre- service teachers' evaluation of their self directed learning (SDL) abilities level (LD, R-'Regular' and EX-Excellent pre-service teachers)

Figure 2 shows the differences between the three groups (LD students, Excellent students and Regular students) in lesson participation. The Excellent students reported on equal participation in an online course and in a traditional one, the regular students reported on lower participation in an online course in comparison to a traditional one while the LD students reported on higher participation in an online course in comparison to a traditional course, and actually, equals the Excellent students'. The difference was repeated on five past years although it is not significant.

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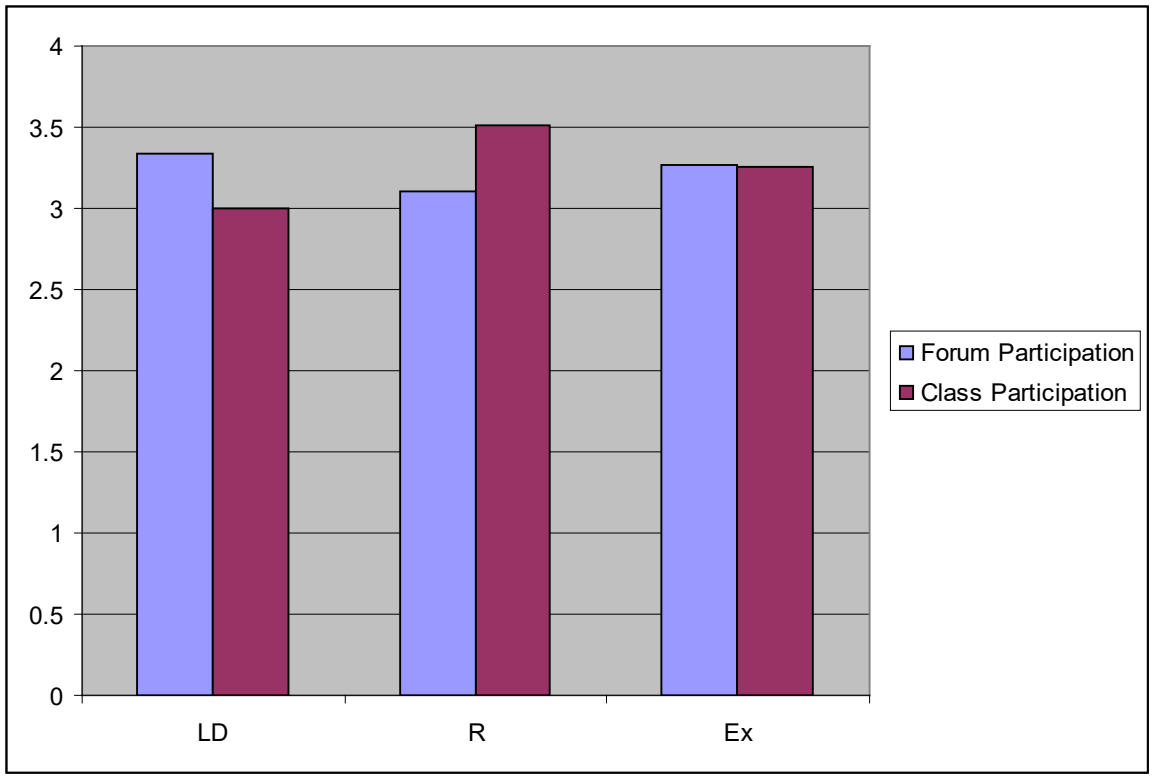

Figure 2. Pre-service teachers' evaluation of participation level in a traditional course and in an online forum (LD, 'Regular' and Excellent pre-service teachers).

Students' satisfaction of the online course activities and skills

The POST questionnaire required students to evaluate and rank the activities conducted in the course and the skills they acquired including: planning and execution processes and laboratory water lab, Forum management and participation, and an authentic task activity (for details see methodology).

Analysis distinguishes ($p < 0.05$) between LD student group and the other two groups (regular and excellent students) on the following activities: an authentic task, Water Lab and Forum management (Table 1).

A multivariate analysis in the form of discriminated analysis performed on the data revealed one significant function which differentiated between the LD students to the other groups (regular and honoured). The results are presented in Table 1.

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Table 1: Structure Coefficients Discriminating between LD students and other students

The Subjects	Structure Coefficients
Otentic task	.47
Water Lab	.47
Forum M	.29
Forum P	.199
Mabat	-.137
Tiltan	-.044
Eigenvalue	.69
X^2	7.72*
Wilks-lambnda	.41
Significance	<0.05
Centroids:	
LD	-1.43
R	.46
EX	.76

Note: Structural coefficients over .25 are underlined

Detailed assessment of LD students, excellent students and regular students standard measures distinguish (an authentic task, water laboratory and forum management is shown in Figure 3.

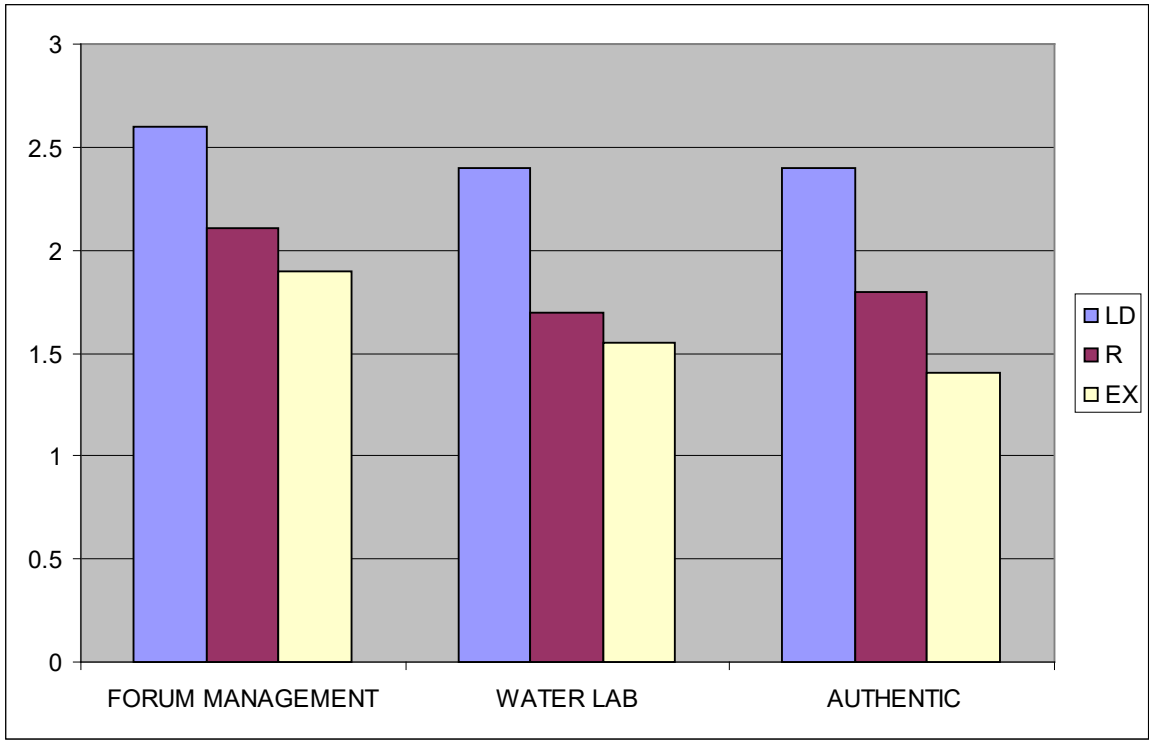

Figure 3. Pre-service teachers' evaluation of forum management, water lab and authentic task

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Figure 3 shows higher satisfaction expressed by the LD students compared with their peers regarding the three distinguished indices; an authentic task (0.47), water laboratory (0.47) and forum management (0.29). More, it can be seen, that the regular students` evaluation is also higher than that of the excellent students in all three indices (authentic task, water lab and forum management), although the difference is not significant.

Students` achievements in the online course

Students' grades were given by lecturers at the end of the course and were based on the assessment of the following activities: participating in forums; tasks performance; Forum management, and quality of the final project. The findings showed that the LD students' average grade was high (89) than their counterparts the excellent (87) and 'regular' (80) students. No comparison was made between students' grades and scores in the online course to traditional courses.

Discussion

The advantages of an online science education course to diverse backgrounds students (LD students, excellent students and regular students) are presented in this study. The ongoing five-year findings pinpointed the advantages of the science education online course to all three groups of students, yet it carefully reports a slight but explicitly marginal advantage of the LD students' achievements in comparison to excellent students and regular students. The unexpected LD students' achievement is not in line with other researches (Kwesi, 2002). The LD students' success was expressed by their final course score given by lecturer, as well as the improvement in the students' evaluation of their own self-learning ability followed the online course, their satisfaction level regarding learned contents, participation in discussion groups and tasks performance. A significant difference was found between the LD students and their peers, the excellent students and regular students regarding the authentic task, the water lab and their forum management. The possibility to deal with everyday authentic subject as well as the opportunity to conduct an online study forum was particularly significant for the LD students. Moreover the LD students reported on higher participation in the online course in comparison to traditional one, and on high interaction with lecturer and colleagues. A striking result indicating the accessibility of online learning for disabled students was also pointed by Badge et al. regarding disabled students using significantly more 'user control' features than the non-disabled group, while actively seeking out information by selecting appropriate and direct sections of the material (Badge, Dawson, Cann & Scott, 2008).Similar benefits of interaction and collaborative learning in online learning is reported also in literature (O'Neil & Fisher, 2008; Shea, Pickett & Sau Li, 2005) while the low benefit of interaction regarding excellent students in this research contradicts others (Olszewski & Lee, 2004).

These differences may result from various characteristics of the courses, for example, teaching methods of the online course (working in pairs, cooperative learning, peer review), course content (theoretical issues or authentic topics related to everyday life), online tools (forum, chat, practice, videos, simulations, audio lecture, learning through texts), type of task required

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(reading, forum participation, hands on lab) and the assessment of learning (formative assessment, summative assessment). When online learning is used just for knowledge transfer and mainly as a communication platform, the online learning advantages that lead to the success of the learners will hardly be expressed (Means, Toyama, Murphy, Bakia & Jones 2009). In this case there may be a precedence that the excellent students are capable of coping with their own educational content, and therefore rarely use discussion groups or supervisor support. In contrast, using a variety of online tools in online courses, probably contributes all background students, and especially LD students, as was described in this research. The online tools used in this research were: synchronous classes using audio and visual means (supported mainly the LD students), students' forum management (possible cooperative learning and peer review), computerized follow-up submission of assignments (allowing task divided into small units and helping students with time management), online documentation of the products (continuous and intensive formative assessment), forum support (for questions, guidance and assistance). In an online discussion forum, discourse lies at the heart of knowledge construction since learning is social, collaborative and consensual and negotiated.

Students describe unique features of the online course: Flexibility and choices in utilization of the information and in time management; Interaction including possible cooperative learning and peer review, duration and time extent were determined by the learners; Knowledge construction based on the transfer of responsibility to the learner, on thinking and learning groups and on individual and customized learners support.

Adjusting instruction to students from different backgrounds is a challenge facing colleges and schools education. The combination of excellent students with LD students and regular students intensifies the challenge. These encouraging current findings suggest an on line course contribution to students from different backgrounds.

However as stated, this study is based only on one online course and on a relatively small sample of students. The findings are based on students' attitudes and their perceptions of the online course contribution to their learning. To establish the apparent trend from this study more online courses should be examined and the sample increased. It also should examine other methods (such as observation, the think aloud, report analysis and report communication tasks) to deepen the online course learning assessment.

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CONCEPT LEARNING VIA SMS DELIVERY AT THE UNIVERSITY LEVEL

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Abstract

Latest technology based distance learning and mobile learning delivery platforms include cell phone based SMS technologies that provide access to learning materials without being limited by space or time. Sophisticated technological advances in the domain of pedagogical delivery have led to motivated, flexible, user-friendly, controlled and adaptive learning using cell phone delivery platforms.

In the present study three groups of first year university students who studied Jewish concepts in an elective 15 week long (semester) course were exposed to three different modes of concept delivery. The first group of students received weekly lists of Jewish concepts sent via SMS messages to their cell-phones, the second group received weekly lists of Jewish concepts sent via email messages to their email inboxes, and the third group of students received weekly snail mail lists of Jewish concepts. The definitions of Jewish concepts studied by SMS, email and snail mail delivery platforms were identical and the students received 20 Jewish concept definitions on a weekly basis (except for weekends) for a period of 15 weeks. At the end of this period the students in the three groups were tested on a standardized Jewish concepts achievement test and responded to a questionnaire that examined their levels of learner curiosity, learner self-efficacy and learner technological self-confidence.

Results of the study indicate that there were no significant differences between the achievement scores on the standardized Jewish concepts achievement test attained by students in the SMS to cell-phone delivery group, the email delivery group and the snail mail delivery group. However, there were significant differences between the students in the three different delivery groups regarding their levels of learner curiosity, learner self-efficacy and learner technological self-confidence. The students who received Jewish concepts via SMS messages indicated a significantly higher level of learner curiosity than their counterparts who received lists of concepts via email messages who in turn exhibited a significantly higher level of learner curiosity than students who received concepts via snail mail. Students in the SMS group also had a significantly higher level of learner self-efficacy than their counterparts in both the email and snail mail groups. No significant differences were found between students in the email group and those in the snail mail group on the learner self-efficacy factor. Lastly there were no significant differences between the levels of students in the SMS and email groups on

the learner technological self-confidence factor. However, students in both SMS and email groups were significantly higher than students in the snail mail group on this factor.

The results of the study indicate the potential evident in SMS based cell-phone technology regarding enhancement of students' attitudes toward learner curiosity, learner self-efficacy and learner technological self-confidence. Thus cell-phone based SMS messaging can become a viable technological mobile delivery system in the university learning process and serve as a routine platform for the delivery of relevant learning materials.

Introduction

Many universities increasingly implement a variety of technology based distance learning methodologies as viable alternatives to traditional classroom instruction. Distance learning platforms via internet, email and cell-phones are increasingly penetrating the domain of academic learning and provide students with dramatically increased access to sources and subject matter relevant to their studies. Current technology based distance learning is, inter alia, based on materials provided through methodologies such as internet, email and cell-phones and an ever increasing number of research studies are being conducted in order to verify the educational value of such technology based distance learning methodologies at the university level (Harris, 2012).

Technology Based Distance Learning

Distance learning has developed over the years to overcome the limitations of traditional face-to-face learning which necessitates the presence of the student in a formal classroom setting. From its inception when distance learning was confined to the delivery of learning material via snail mail, landline telephone and radio broadcasts, it has progressed through delivery systems such as television broadcasts and videoconferencing and at present focuses on digital delivery systems such as internet, email and mobile learning platforms (Katz & Yablon, 2003).

Recent studies have indicated that distance learning systems are perceived by students as being convenient, flexible, time saving and cost saving (Valenta et al., 2001). Interactive internet, email and mobile learning offer tuition that is especially characterized by flexibility offered to the learner. In addition the above methodologies are designed to provide platforms that enhance modification, reinforcement and even modelling of learning processes, thereby fulfilling the cognitive as well as affective needs and requirements of students (Richardson & Swan, 2003).

Ismail et al. (2010) confronted the implications of university learning and instruction using technology based distance learning courses. They contended that technology based distance learning has moved formal instruction in these courses from the on-site setting of the university campus to the home of the student. Learning has become significantly more flexible and content sources more accessible. Creating, sharing and knowledge capitalization are all facilitated by distance learning. Wider sources of learning are provided in technology based

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distance learning courses and worldwide expertise can systematically be brought to the student's desktop.

With the rapid development of distance learning courses for use in university level education, increasingly more research studies have been conducted in an attempt to evaluate different issues related to technology based distance learning. For example Chandra & Watters (2012) indicated that learning physics through the medium of technology based distance learning not only enhanced students' learning outcomes, but also had a positive impact on their attitudes toward the study of physics. Ituma (2011) confirmed that a large percentage of university students who were enrolled in distance learning university courses had positive perceptions of the technology based learning methodology and were in favour of joining additional distance learning courses that supplemented traditional face-to-face classroom instruction.

Valaitis et al. (2005) found that students who participated in technology based distance learning courses perceived that the methodology increased their learning flexibility and enhanced their ability to process content, and provided access to valuable learning resources. Abdallah (2009) found that technology based distance learning courses contributed to improved quality of students' learning experiences. Students reported positive attitudes toward their technology based learning and felt that such learning should be part and parcel of standard learning practice. Delfino et al. (2010) confirmed that student teachers who participated in technology based distance learning teacher training courses developed self-regulation of learning which provided them with the opportunity to flexibly cope with their academic assignments.

Cell-Phone Learning

One of the emerging learning strategies that has developed in technology based distance learning in recent years and is receiving growing attention from both students and teachers is in the domain of mobile learning, and more specifically, focuses on cell-phone learning technology (Prensky, 2005). It should be noted that the use of cell-phones is multi-dimensional and cell-phone technology now provides technological possibilities including voice, text, still-camera, video, paging and geo-positioning capabilities. These tools provide a rich variety of platforms that enhance the learning process. Moreover, learning is not bound by space or time and students can choose to engage in learning without almost any limitations (Dieterle & Dede, 2006).

In Europe, China, Japan, and the Philippines, students already use cell-phones as learning tools. Thornton & Houser (2002, 2003) described several innovative projects using cell-phones to teach English at a Japanese university and the BBC World Service's Learning English section offers English lessons via SMS in Francophone West Africa and China (Godwin-Jones, 2005). Cell-phone based learning projects managed by several universities worldwide have indicated the positive outcomes of such learning methods (Divitini et al., 2002; Garner et al., 2002; Seppala, 2002; Stone & Briggs, 2002). Additional studies have described language learning based on cell-phone technology (Kiernan & Aizawa, 2004; Katz &

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Yablon, 2009; 2011; 2012). These studies describe how vocabulary transmitted by SMS in a spaced and scheduled pattern of delivery contributed to student proficiency in English or other languages.

Research studies have been conducted in order to investigate the relationship between students' attitudes toward the cell-phone based learning process. Learner motivation, learner autonomy, learner control of the learning process, learning flexibility, learner curiosity, learner self-efficacy, learner technological self-confidence, and user friendliness of the technology strategy are some of the major factors that have been found to contribute to the enhancement of technology based distance learning. Mainemelis et al. (2002), Zurita and Bruce (2005), Cavus and Ibrahim (2009) as well as Katz and Yablon (2009, 2011; 2012) confirmed the association of some of the above factors with effective cell-phone based learning.

As Katz & Yablon (2009; 2011; 2012) have studied the centrality of students' attitudes including learner motivation, learner autonomy, learning flexibility and user friendliness of the technology strategy toward cell-phone learning at the university level in Israel, the current study, pays particular attention to students' attitudes toward three additional factors thought to enhance effective learning by cell-phone based SMS messaging, namely learner curiosity, learner self-efficacy and learner technological self-confidence, In addition the study examines the issue of academic achievement attained when using SMS delivery for the learning of concepts.

Method

Sample

The research sample consisted of 79 first year students enrolled in a 15 week semester-long elective Jewish concepts foundation course offered at one of the seven chartered universities in Israel. The students were randomly assigned to the three different research groups in which students were provided with lists of definitions of Jewish concepts as follows:

1. 28 students received their Jewish concepts lists via cell-phone based SMS messages.
2. 26 students sent their Jewish concepts lists via email messages to their email inboxes.
3. 25 students sent their Jewish concepts lists by snail mail delivery.

Instruments

Two research instruments were administered to the students in this research study. A standardized Jewish concepts test was administered to the participants in order to assess students' mastery of definitions of basic Jewish concepts. The test scale ranged from 0-100, the higher grades indicating higher levels of achievement on the Jewish concepts test. The second instrument administered was a 21 item Likert scale type response questionnaire (students responded to a five point scale with 1=totally disagree and 5=totally agree) designed to examine the students' perceptions of the attitudinal research factors as follows: The first

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factor, learner curiosity, contained seven items (Cronbach α= 0.82), the second factor, learner self-efficacy, consisted of eight items (Cronbach α=0:86) and the third factor, learner technological self-confidence, was made up of six items (Cronbach α=0.88).

Procedure

Students who were graduates of the Israeli state secular school system and who were enrolled in the elective Jewish concepts foundations course and possessed personal cell-phones with texting capacity were eligible for participation in this study. Following the selection of the students who met the above criteria, they were randomly assigned to the three delivery platform groups. Students in the first group received Jewish concepts via cell-phone based SMS messages; those in the second group received Jewish concepts via email messages; and those placed in the third group received Jewish concepts via snail mail.

The students in the three groups sent weekly lists that contained concise definitions of the Jewish concepts studied in the course, each list containing definitions of 20 new Jewish concepts delivered via the respective learning strategies. Thus each of the students received definitions of 300 Jewish concepts during the 15 week long course. On completion of the course the students in the three groups were administered a standardized Jewish concepts achievement test in order to asses their level of knowledge of the 300 Jewish concepts taught in the course. In addition they were administered the attitudinal questionnaire which examined their scores on the three attitudinal research factors, namely learner curiosity, learner self-efficacy and learner technological self-confidence.

Results

The main aim of this study was to examine the efficiency and effectiveness of three different learning delivery platforms of which two were digital. Two research questions were posed: the first examined the acquisition by students of knowledge concerning Jewish concepts and the second investigated students' attitudes connected to the three learning strategies. The mean scores of each of the attitudinal factors were standardized in order to allow for a comparison between the factor scores. Standardized means and standard deviations of students' scores on the achievement test and on the attitudinal factors are presented in Table 1.

Table 1: Standardized Mean Scores and Standard Deviations of SMS, Email and Snail Mail Groups for Achievement, Learner Curiosity, Learner Self-Efficacy and Learner Technological Self-Confidence

	Factor							
Group	**Learner Curiosity Factor**		**Learner Self-Efficacy Factor**		**Learner Technological Self-Confidence Factor**		**Achievement**	
	M	**S.D.**	**M**	**S.D.**	**M**	**S.D.**	**M**	**S.D.**
SMS Delivery N=28	3.55	0.24	2.85	0.42	3.84	0.46	82.62	10.71
Email Delivery N=26	3.13	0.52	2.55	0.43	3.79	0.49	82.53	11.39
Snail Mail Delivery N=25	2.93	0.51	2.50	0.41	3.48	0.41	81.97	10.32

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Four one-way ANOVA procedures were used in order to compare students' achievement and attitudes as related to the three learning delivery platforms. Results of the statistical analyses indicated that while there were no significant differences between students in the three groups regarding achievement, with students from the three groups achieving similar grades on knowledge of Jewish concepts, significant differences were found for learner curiosity [$F(2,76)=14.30$, $p<0:001$, $\eta^2=0.27$], for learner self-efficacy [$F(2,76)=5.18$, $p<0:01$, $\eta^2=0.12$] and for learner technological self-confidence [$F(2,76)=4.93$, $p<0:001$, $\eta^2=0.16$]. Post-hoc Scheffe tests were then computed to establish the level of intra-group differences. The first Scheffe test revealed that students who received Jewish concepts via SMS messages attained significantly higher scores on the learner curiosity factor than students who received concepts via email messages who in turn achieved significantly higher scores than students who received their list of concepts by snail mail. The second Scheffe test indicated that students who received concepts through the medium of SMS messages attained significantly higher scores on the learner self-efficacy factor than either students who received concepts via email messages or those who received their concepts by snail mail. There was no significant difference between the scores attained on this factor by students in the email and snail mail groups. The third Scheffe test confirmed that while students in the SMS and email groups achieved significantly higher scores on the learner technological self-confidence factor than students in the snail mail group, there was no significant difference between the scores of students in the SMS and email groups on this factor.

Discussion

Results of the statistical analyses of the data collected in this study indicate that none of the three delivery platforms, namely delivery of the lists of Jewish concepts throughout the semester long course via SMS messages to students' cell-phones, delivery to students' email inboxes and delivery to students via snail mail, had any significant advantage regarding academic achievement of students on the standardized Jewish concepts achievement test. Students who studied via all three delivery strategies attained similar grades on the test. Thus it appears that achievement is a factor that does not distinguish between delivery strategies with measured achievement outcomes. This result confirms those indicated in a number of research studies that, on the whole, different delivery platforms do not significantly contribute to differential academic achievement (Katz & Yablon, 2009; 2011; 2012).

However, the findings of the study indicate that the different delivery strategies employed in the present study to provide weekly lists of Jewish concepts to the students are associated with significantly differential levels of learner curiosity, learner self-efficacy and learner technological self-confidence. Scores attained by students on the attitudinal research factors, after receiving lists of Jewish concepts delivered via the three delivery strategies, confirm that SMS messaging to cell-phones is associated more significantly to students' learner curiosity and learner self-efficacy (as found by Kenny et al, 2012) than either email messages or snail mail delivery. The contribution of email messages, although less significant than that of the

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SMS delivery strategy, also contributed more significantly to students' learner curiosity and learner self-efficacy than lists received by snail mail. In addition, the SMS messages of lists of Jewish concepts sent to students' cell-phones as well as lists sent to students' email inboxes made a significantly higher impact on students' learner technological self-confidence than lists of concepts sent to students via snail mail. Although there is no statistically significant difference between students' levels of learner technological self-confidence after receiving lists of Jewish concepts via SMS or email delivery systems, the mean level of learner technological self-confidence of students' who received concepts via SMS delivery is higher than the mean level of their counterparts who received concepts through the medium of email delivery. It appears that as both SMS messages to students' cell-phones as well as lists sent to students' email inboxes may be identified as technologically oriented delivery strategies, they have a more significant impact on learner technological self-confidence than lists of concepts sent to students via snail mail.

It appears that learner curiosity is the most potent of the research factors and most significantly distinguishes between students who studied by way of the three learning strategies. Cell-phone based SMS strategy appears to be most significantly related to the learner curiosity of students towards the learning process, followed by a more moderate level of learner curiosity of those who experienced the email learning delivery, who in turn have a comparatively higher level of learner curiosity than students who received learning material via the snail mail learning strategy.

The results of the present study indicate the potential of SMS messaging of relevant subject matter as a positive delivery platform that enhances affective variables such as learner curiosity, learner self-efficacy and learner technological self-confidence. It should be noted that the significant attitudinal findings do not correlate with higher academic achievement when the three delivery platforms are compared. Further studies need to be conducted so as to further explore the possible relationship between academic achievement and students' attitudes toward learner curiosity, learner self-efficacy and learner technological self-confidence. From a pedagogical point of view it appears that, In general terms, cell-phone-based SMS messaging leads to more significantly positive attitudes of students (as indicated by Song, 2008) than email or snail mail messaging with learner curiosity perceived as the central factor that best distinguishes between the three delivery strategies studied in the present research.

Conclusion

In conclusion it may be stated that the results of the present study indicate that, while the three delivery platforms used in the study to provide students with weekly lists of Jewish concepts were no different from each other in promoting students' academic achievement, the relative advantages of cell-phone based SMS messages most positively enhanced learner curiosity, learner self-efficacy and learner technological self-confidence of students. The results of the present study regarding the relationship between the delivery of subject matter at

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the university level via SMS messages sent to students' cell-phones and students' levels of learner curiosity, learner self-efficacy' learner technological self-confidence add to the findings of other research studies that indicated the significance of the SMS to cell-phone delivery platform for students' levels of learner motivation, learner autonomy, learner control of the learning process, learning flexibility and user friendliness of the technology strategy (following Divitini et al., 2002; Garner et al., 2002; Seppala, 2002; Stone & Briggs, 2002; Thornton & Houser, 2002; 2003; Katz & Yablon, 2009; 2011; 2012) These studies indicated that cell-phone based SMS delivery systems can be offered as a positive alternate technology based delivery system of relevant subject matter when compared to other technology based learning strategies that utilize expensive and sophisticated infrastructures. University educational systems in all societies, whatever their technological infrastructure, can profit immeasurably from the use of SMS to cell-phone learning content delivery in relevant university subjects and courses. More accessible technology and improved pedagogy need to be developed in order to enhance the use of cell-phone based SMS delivery in routine learning at the university level but it seems clear that the mass incorporation of cell-phones in institutions of higher education is a distinct possibility in the foreseeable future.

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ACHIEVEMENTS OF LEARNING DESIGN IN MULTI-AGENT MULTI-LANGUAGE INTELLIGENT SYSTEMS – THE I-TUTOR APPROACH

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Introduction

This paper is discussing the scientific background of a multi-agent educational robot design from the designer's point of view. From the early years of the systematic use of Instructional design, educational scientists wanted to use the results of artificial intelligence to support authors, developers, researchers, in their pedagogical work to create "automatic" course designing machines or make the built in process more and more responsive and adaptive to the tuition circumstances, therefore design a more intelligent training material (Bramucci & Zarka, 2012). The tracks of this huge work shows that the approach of the robotisation of instructional design approach is more slow that was initially expected. The last thirty years' developments in this discipline therefore are still in an emerging phase. The problem of not knowing how we learn, and the limitation to theoretically describe any learning content, leads us to particular solutions for particular problems. General solutions need radical changes in the approach.

The aim of the I-Tutor project (http://www.intelligent-tutor.eu) is to develop this multi-agent based intelligent system to be applied in online education and that does not rely on a deterministic approach. Students and teachers could, thus, take advantage of the ITS as a boundary object to regulate teaching and learning process during their actions in a way that could be personalized and foster reflective processes. In this paper we show examples of some mayor research steps towards the solution of intelligent instructional design, and conclude to a new approach of learning design that was used in the I-Tutor project aiming at testing a new educational robot containing learning design elements as well.

Instructional design and artificial intelligence

Definitions

Artificial Intelligence

Artificial intelligence (AI) is the intelligence of machines or software, and is also a branch of computer science that studies and develops intelligent machines and software. Major AI researchers and textbooks define the field as "the study and design of intelligent agents" (Poole, Mackworth & Goebel, 1998).

Instructional Design

In narrower sense ID is the practice of creating "instructional experiences which make the acquisition of knowledge and skill more efficient, effective, and appealing" (Merrill, Drake, Lacy & Pratt, 1996). Or "Instructional Design is the systemic and systematic process of applying strategies and techniques derived from behavioural, cognitive, and constructivist theories to the solution of instructional problem" (Mizogouchi & Bordeau, 2000).

Instructional Systems Design

The broader sense of Instructional Design is also called Instructional Systems Design (ISD) and it deals with the construction of the whole model of the instructional process. A model is a mental representation of something else, an object or a process required, because of dissatisfaction for status of real things. Therefore an instructional model describes an instructional experience required, imagined and patterned in the design. Consequently also an instructional pattern can be defined a cognitive artifact, because it is a real object designed and constructed for a problem solving. One classical model of ISD is the ADDIE model (Branson et al., 1975).

Categories of ID

There are many possible categorizations of ID. To our scope of examining the roles of AI in ID we have to distinguish three settings:

- student-only;
- teacher-led;
- community-based settings.

Instructional design in its "pure form" can be observed in the student-only settings. Here the student is instructed by the machine. We initially do not observe the possibility of teacher intervention or the existence of other learners, who obviously affect the learning process. This approach is common in the literature, as Koschmann (1996) describes. Since one-on-one tutoring is commonly considered the gold standard against which other methods of instruction are measured (Bloom, 1984), the paradigm is founded on the proposition that

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education could be globally improved by providing every student with a personal (albeit machine-based) tutor (Lepper, Woolverton, Mumme & Gurtner, 1993). I-tutor approach going beyond this student-only setting.

Roles in ID

In the light of AI we have to define roles in computer enhanced (student-only) tuition, to narrow further the topic:

- Designer: The pedagogical or andragogical expert (or group) who is preparing the instructional program before the learning takes place. This role is typically the role of a teacher, but in many cases in larger Universities and Institutions that deal with distance education and on-line learning, this is already an exclusive role, already a profession.
- Tutor: There are many common definitions of tutor. We call tutor the andragogical process expert, who has a "working knowledge of the subject for discussion but they will also have a concrete knowledge of facilitation and how to direct the student to assess their knowledge gaps and seek out answers on their own" (Davis et al., 1992). This knowledge in self-directed learning (student-only setting) is in most cases dealing exclusively with facilitating the self-learning path, by technically helping to work with the machine led instructional material and to help in detail by pacing the material. Tutor's important role is to develop meta-cognitive skills, like discovering and understanding the consequences of the learner's learning style.
- Learner: Learner is in AI terminology the human who is following the programmed instruction.
- Machine: Program which is giving the instruction and processing learner input. This program can be itself the robot, or agent, but the machine can be designed by the author(s) with help of AI (authoring agent).

I-tutor is adapting this approach by defining the role of instructional designer, tutor and student.

Pedagogical agents

The problem of developing machines that intelligently teach (Intelligent Instructional Systems) has a long history. The research work started with pedagogical agents. The development of pedagogical agents appeared to be so complex that further research focussed on authoring agents. Authoring agents are not directly instructing learners but intelligently help authors do make effective instruction. The need for intelligent instructional systems emerged.

> *"Pedagogical agents are autonomous agents that occupy computer learning environments and facilitate learning by interacting with students or other agents. Although intelligent tutoring systems have been around since the*

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> *1970s, pedagogical agents did not appear until the late 1980s. Pedagogical agents have been designed to produce a range of behaviours that include the ability to reason about multiple agents in simulated environments; act as a peer, co learner, or competitor; generate multiple, pedagogically appropriate strategies; and assist instructors and students in virtual worlds" (Koschmann, 1996).*

This approach was developed further in authoring agents discussed later in this paper.

Authoring agents: Learning Design Support Environment (LDSE)

The educational scenario requires continuous changes in the adoption of educational models and tools. Diana Laurillard with collaborators is the project leader of Learning Design Support Environment (LDSE) and she designs the basic functionality and pedagogical input of LDSE (https://sites.google.com/a/lkl.ac.uk/ldse/Home).

This research discovers how to use digital technologies to support teachers in designing effective technology-enhanced learning (TEL). Teachers will be required to use progressively more TEL and the teaching community should be at the forefront of TEL innovation. Thanks to the use of TEL the development of new knowledge, in this case about professional practice, should be carried out in the spirit of reflective collaborative design. The same technologies that are changing the way students learn can also support teachers' own learning and teachers' design.

The LDSE project aims to fill the gap in research that currently exists between technology, design and learning for teachers. I-tutor project is taking this LDSE model when designing the authoring agent of the I-tutor robot.

Semantic WEB and IIS

Core technologies

Another approach to IIS (Intelligent Instructional Systems) is the approach of Semantic WEB. In order to understand the structure of the content of the web based learning material, special technical solutions have to be used. Koper (2004) collects the core technologies:

- Unified Modelling Language (UML) (Booch, Rumbaugh & Jacobson, 1999; Fowler, 2000). UML provides a collection of models and graphs to describe the structural and behavioural semantics of any complex information system;
- XML and XML Schema's (XML, 2003), derived from SGML (ISO 8879). These are tools used to go beyond the fixed, page structure oriented vocabulary that HTML provides;
- RDF and RDF-Schema is the metadata approach from the W3C (RDF, 2003). It does not structure the syntax of the data, but defines semantic meaning for data on the web;

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- Topic Maps (ISO/IEC 13250:2000), provide an alternative technology to RDF (Maicher & Park, 2005). Topic maps define arbitrarily complex semantic knowledge structures and allow the exchange of information necessary to collaboratively build and maintain indexes of knowledge;
- OWL Web Ontology Language. According to Mc Guinness and van Harmelen (2004), ontology languages provide greater machine interpretability of Web content than that supported by XML, RDF, and RDF-Schema;
- Latent Semantic Analysis – LSA, (Landauer & Dumais, 1997). The approaches mentioned above require humans to provide the semantic meaning by using a machine interpretable coding scheme;
- Software Agents (Axelrod, 1997; Ferber, 1999; Jennings, 1998). One of the basic technologies that can exploit the coded semantics on the web is software agents.

It seems to me that for describing ontologies we need for IIS OWL will be the most suitable tool. Among many other possibilities that semantic web may offer, Instructional design can also benefit from that Devedzic describes: "Intelligence of a Web-based educational system means the capability of demonstrating some form of knowledge-based reasoning in curriculum sequencing, in analysis of the student's solutions, and in providing interactive problem-solving support (possibly example-based) to the student, all adapted to the Web technology" (Brusilovsky & Miller, 2001).

Those semantic technologies mainly OWL and LSA were widely used in building I-tutor robot.

Standard vocabularies

Looking at issues that would be interesting in AI and ID, Devedzic explains:

„Authors develop educational content on the server in accordance with important pedagogical issues such as **instructional design** and human learning theories, to ensure educational justification of learning, assessment, and possible collaboration among the students. The way to make the content machine-understandable, machine-processable, and hence agent ready, is to provide semantic mark up with pointers to a number of shareable educational ontologies" (Devedzic, 2004).

He also highlights (like Mizogouchi & Bordeau, 2002) the problem of ID ontology structures also from linguistic and structural differences point of view:

"One of the reasons why standard ontologies that should cover various areas and aspects of teaching and learning are still missing is the lack of standard vocabulary in the domain of education and instructional design. There are several working groups and efforts towards development of an official standard vocabulary. Examples include the IEEE Learning Technology Standards Committee (http://www.ieeeltsc.org:8080/Plone), Technical Standards for Computer-Based Learning, IEEE Computer Society P1484

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(http://www.computer.org/portal/web/guest/home), IMS Global Learning Consortium, Inc. (http://www.imsproject.org), and ISO/IEC JTC1/SC36 Standard (http://www.sc36.org:8080/). However, there is still a lot of work to do in that direction. Hence many structural, semantic, and language differences constrain reusability of applications produced by current tools" (Devedzic, 2004).

He criticizes Murray (1998), Mizoguchi and Bourdeau (2002) because „Ontology-development tools that have resulted from these efforts have implemented a number of important ideas, but did not support XML/RDF encoding of ontologies and consequently were not Semantic Web-ready" (Devedzic, 2004).

He lists then the possible standards that bring us closer to the solution:

> *„The statement of purpose of the project is very detailed, and includes issues like search, evaluation, acquisition, and utilization of Learning Objects, sharing, exchange, composition, and decomposition of Learning Objects across any technology supported learning systems and applications, enabling pedagogical agents to automatically and dynamically compose personalized lessons for an individual learner, enabling the teachers to express educational content in a standardized way, and many more. All of this is actually the essence of teaching and learning on the Semantic Web. P1484.14 supports P1484.12 by proposing and developing techniques such as rule-based XML coding bindings for data models. Finally, it should be noted that such efforts are related to more general standard proposals for ontology development. People involved with the IEEE SUO (Standard Upper Ontology) project 1600.1 (http://suo.ieee.org) are trying to specify an upper ontology that will enable computers to utilize it for applications such as semantic interoperability (not only the interoperability among software and database applications, but also the semantic interoperability among various object-level ontologies themselves), intelligent information search and retrieval, automated inferencing, and natural language processing" (Devedzic, 2004).*

Further development trends are envisaged by Devedzic (2004) which might worth our attention: "An important research trend in the Semantic Web community that may support the idea of gradually evolving educational ontologies as well is ontology learning (Maedche & Staab, 2001). The idea is to enable ontology import, extraction, pruning, refinement, and evaluation, giving the ontology engineer coordinated tools for ontology modelling. Ontology learning can be from free text, dictionaries, XML documents, and legacy ontologies, as well as from reverse engineering of ontologies from database schemata."

In the time framework of I-tutor, and because of the multi-language approach of the semantic agent, a semantic database is built, and helps the tutor and students, but a semantic agent will be developed in a further development phase.

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Implementation of theory in I-tutor design

I-TUTOR acts as an agent community, as stated in the Project Description: the main source of inspiration for this architectural choice are Bentivoglio et al. (2010) and Pilato et al. (2008). In this works, the main focus was student tutoring, and the agent community was designed to support a conversational agent aimed at dialoguing with the student to assess her learning, and to stimulate her self-reflection processes. Artificial Intelligence was mostly encapsulated in such an agent to support dialogue with Natural Language Processing (NLP) and reasoning techniques.

The specification extraction process altered the original design, which was mostly cognition-oriented, while inserting considerations and scientific results from the Education Science discussed earlier. The current I-TUTOR design takes into account also the other actors involved in the learning process using a Virtual Learning Environment (VLE). As a consequence, a suitable arrangement of the agents to be designed has been devised.

I-TUTOR specifications

I-TUTOR is intended to provide intelligent support to the three main actors involved in the learning process through a VLE:

- The instructional designer
- The tutor
- The student.

All the roles are involved in intense cognitive processes so "intelligence" in I-TUTOR has to be intended in support of their decisions. The intelligent mechanisms to be implemented derive from both functional and non-functional specifications along with time constraints related to the project schedule, and duration. In what follows, such specifications are listed.

Functional specifications put into evidence that the main components to be implemented in I-TUTOR are:

- Monitoring,
- Profiling,
- Alerting,
- Learning Design,
- Visualization,
- Semantic Support.

The two relevant agents of the functions of I-TUTOR for this paper are the Learning Design Agent and the Semantic support (yet not an agent).

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Learning Design Agent

The Learning Design relies on the learning design ontology derived purposely from the process described by Dana Laurillard, and integrated by UNIMC. The same partner is in charge to engineer the related OWL document. The learning design process is arranged in "modules" that are further split into "sessions" (i.e. lessons) while each session consists of "activities".

The core of the ontology is the "didactical device" that is used to accomplish an activity in the VLE. A didactical device consists of a "tool" and a "content". A tool owns a "title", some involved "people", and a "time" for being used to accomplish the task. A content owns some "subject", has some "objectives", and has "finalities". Finally, a "learning path" is a pathway along devices on the tool side, while a "content path" is a pathway along devices on the content side. Content and learning paths have to be displayed to the student.

The learning design methodology consists in designing the whole module, which has its macro-objectives, a description, and a set of keywords. A suitable data structure will hold the module global information. For each module, the session, and activities are instantiated each with its micro-objectives, the subject, and the finalities. Education Science provides ways for building correspondences between macro- and micro-objectives. The key idea is to have the module information structure linked with the corresponding activities and devices via macro- to micro-objectives mapping.

The Learning Design performs the following main functions:

- Takes the learning design ontology as its input.
- Produces a XML fram-like description of the alerting events.
- Has an author tool to implement the learning design methodology both at module and activity level; such a tool is integrated seamlessly with the Moodle counterpart.
- Performs macro- to micro- objectives mapping at least via a suitable look-up table.
- Stores either entire design structures or single patterns.
- Extracts co-occurrence rules, and suggests the most used patterns to the designer.
- Sends all the information to the Visualization.

Semantic Support

Semantic support is just a set of text analysis functions to accomplish the language-oriented tasks in the Profiling and in the Learning Design. We are using:

- Stemming,
- Stop-words removal,
- Keywords extraction,
- Topic categorization,
- NER,
- Latent Semantic Indexing.

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Conclusions

The first version of I-tutor is already built and ready for piloting in different educational settings. By the end of the year modifications and adjustments to the I-tutor will be made, and will be offered not only to the project partners and piloting courses, but for the wider Moodle community to use and develop further. During the project lifecycle detailed valorisation plan will be developed.

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TEACHER VERSION 3.0

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Appetizer

Upgrade now – to Teacher 3.0. Computers mediate how we learn and teach. That's why the challenge is to establish a new concept for teaching. Join our presentation and get inspired by Virtuella and her digital environment.

What is the problem and why should people care?

Students today have instant access to information through technology and the web 24/7/anywhere, anytime.

They maximize their digital lifestyle by consuming digital content to an extent never seen before. The big issue is then how to use their digital lifestyle as an advantage in the classroom? How can teachers connect to students and make them start another browser than their homeland Facebook?

We are at a crossroads where we must reconsider what the computer or ICT can do for us and not just what we can do with it!

Today's students are all so-called digital natives. They live in the land of Facebook. Here their cultural footprint is to ping the other inhabitants to assure themselves that they are still popular; that they are part of the group. Just like a computer pings another computer to make sure that it is online and ready to send and receive data packages throughout the network.

We are at a crossroads where we must reconsider how to make good use of their culture and habits when teaching.

Computers and mobile devices are mediating how we learn and teach. Therefore, the challenge is to establish a new concept for teaching where teachers and students can explore and share their experience of digital devices and applications in a comfortable way.

To address this need, Niels Brock has developed a digital skills course the aim of which is to inspire teachers to develop and share digital learning products. At the same time they will become confident with technology and be able to establish a best practice within their field of expertise.

Our approach and our result – "Teacher Version 3.0"

The course "Teacher Version 3.0" has been specially designed for more than 800 teachers at Niels Brock – one of the largest educational institutions in Denmark. The essential idea behind the framework is to evoke, invoke and provoke the teachers' day-to-day use of new digital media.

The course

Niels Brock's digital skills course is to inspire teachers to develop and share digital learning products. In workshops, they get hands-on knowledge of digital learning products and learn to create concrete products themselves – ready for use in their own teaching.

The concept and e-competence framework will be presented and demonstrated by samples. The concept is unique as it integrates technology in pedagogical practices as new e-learning solutions linking students and teachers.

Course framework

Competence development is built on a sequence of modules, including one mandatory and a number of optional modules. The objective for the mandatory module is to provide a common ICT professional basis for the educational development that the optional modules have paved the way for.

Framework for each module

The individual modules are project-oriented, alternating between training course, individual work, project work and guidance. Each module ends in a concrete product, which each participant develops for his or her own teaching. We do this to ensure that the teacher's day-to-day work forms part of the project and that work efforts pay off as they contribute to the actual teaching. This is the essential idea behind this framework; namely to ensure a transfer between course module and the teacher's day-to-day work.

Conclusions and why people should listen to us

Upgrade now – with the Teacher Version 3.0 concept, teachers become better at using new media in class as it both inspires and forces them to develop a concept of their own.

Develop + Test + Share are the keywords. The concept facilitates a feeling of comfort for teachers as they plunge into doing digital teaching with colleges.

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Outcome measures

As a result of having upgraded 50 % of Niels Brocks teachers to 'Teacher 3.0' we can conclude that: 90 % say 'thumbs up'; 'we have dared integrating more ICT in their teaching'; 'we are inspired and encouraged to use e-skills'. And in fact they find more fun in teaching because the have upgraded to Teacher 3.0!

Benefits for schools: teachers become better e-skilled in facilitating e.g. virtual education environments. Better pay off on hardware investments. Kick start of knowledge sharing

With 'Teacher 3.0' concept, teachers get to know how new media can be integrated to become a natural part of the daily class. Through common experience, teachers will upgrade their individual e-skills. The all-knowing teacher of the past will become a path finder, a facilitator or/and a digital organizer.

Students become more engaged and responsible. Mutually learning communities arise, because we learn from on another – teachers and students.

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LEARNING QUALITY FOR ROMANIAN STUDENTS AT-RISK – THE EXPERIENCE OF AN EDUCATION PRIORITY AREAS PROJECT

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An Education Priority Areas project run in 2012-2013 by the Institute for Educational Sciences

Since 2003, the Institute for Educational Sciences has developed each school year, an Education Priority Areas (EPA) project, having the financial support of UNICEF and also some NGOs as partners. One of the main objectives of the project was "to increase the participation in education and to reduce the risk of dropping out of children with learning difficulties or of those from socio-economically disadvantages areas, with focus on Roma children" (Jigău, 2006). The project involved schools from different counties of Romania which had in common some characteristics, such as: being located in socio-economically disadvantaged areas and/or in communities with large Roma population; large number of students at-risk having poor school performance and being in danger to drop out the school; poor situation of families to which students at-risk belong, due to poverty, unemployment, low education level; in many cases, one parent or even both parents are working abroad, leaving, in best cases, the grandparents to take care of their children. Over time the number of schools involved in the project has grown; in 2003-2004, the project aimed at improving the situation of a single school; in the school year 2012-2013 in the project are included 96 schools from 33 counties. Since 2003, the project has helped many schools and teachers who worked with students at-risk to find ways to attract and involve these students in successful learning activities.

The EPA project conducted in the school year 2012-2013 has as main goal the development of a system of intervention targeting the educational causes of absenteeism and drop out in the schools involved in the project. Activities undertaken by the project are complex, targeting the direct or indirect support, but which is necessary and useful, for the educational activities in schools; for example, the following categories of activities can be mentioned: the training program (in process of accreditation) for teachers, parents and the management team; involving students at-risk in curricular and extra-curricular activities; exchanges of experience at the county level; material support to schools included in the project. Irrespective of the type and the specific of the activities conducted, the interventions have in common issues such as: a) orientation to key players who can help to reduce the phenomenon of absenteeism and drop out; this is why the target group of the project includes students at-risk of dropping out,

parents of these students, teachers of different specialties working with students at-risk, school managers; b) priority given to actions which can prevent the drop out of the students c) positive approach of problems that require short, medium and/or long term of intervention and solving.

This article is developed from the perspective of the researcher who is participating in the project to conduct the training program for teachers who teach Civics in primary and secondary education in EPA schools.

The training program has been a reference component of the EPA project, irrespective of the school year in which it was conducted; this is a way to recognize, on the one hand, the essential role that the teacher plays in supporting students' learning and, on the other hand, the link between teachers' competences (acquired through initial or continuing education) and the quality of their activity with students. Recognizing the essential role of teachers in education, the document of the European Commission, Common European principles for teacher competences and qualifications, highlights several categories of competences needed by teachers, which refer to: Work with others, Work with knowledge, technology and information, Work with and in society (European Commission, 2005). The text presented below is a selection of relevant competences needed, in general, by teachers, including teachers who work with students at-risk.

> *Teachers should be able to:*
> *Work with others: they work in a profession which should be based on the values of social inclusion and nurturing the potential of every learner.*
> *Work with knowledge, technology and information: … Their pedagogic skills should allow them to build and manage learning environments …*
> *Work with and in society: … They also need to understand the factors that create social cohesion and exclusion in society … (European Commission, 2005)*

In the school year 2012-2013, the structure of the training program for Civics includes the following components:

- Training of teachers who teach Civics in EPA schools; the training was organized at regional level
- Online interaction with participant teachers and online support given to them (to develop their personal electronic portfolio and also to help them to improve the quality of their work in school)
- Training seminars (follow up), organized at regional level.

At present, the training course is in the stage of the online interaction with participant teachers, the face to face training being completed.

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The experience of the EPA teacher training programme as a support of the learning quality for the students at-risk

For Civics, the face to face training course represented the beginning of a necessary stage in the continuous training of teachers. The face to face training course was conducted on the basis of some major options regarding the design of learning, such as: a) the deconstruction of didactic stereotypes in approaching the learning to Civics; b) the focus on meaningful learning, relevant for the needs of students who are at-risk of dropping out; c) valuing some acquisitions acquired by students in non-formal and informal learning within the formal education developed in school.

These options are interrelated; the first aspect regarding the didactic stereotypes that may arise in implementing the official curriculum, aimed at raising awareness of teachers about the need to design meaningful learning activities, taking into consideration real aspects of the teaching practice; but such a goal has as a starting point just the deconstruction of stereotypes and prejudices (Sarivan, 2011). In Table 1, presented below, there are included, on the one hand, teaching practices transformed in time in stereotypes and prejudices that undermine meaningful learning and, on the other hand, teaching practices which may represent starting points for meaningful learning.

Table 1: Teaching practices of the teachers and their influence on meaningful learning

Teaching practices that undermine the meaningful learning	**Teaching practices that support the meaningful learning**
designing learning activities not taking into consideration, to a sufficient extent, the real needs of students at-risk	designing learning activities based on the real needs of students at-risk
designing learning activities in terms of content which has to be "taught", the emphasis on teaching restricting the meaning of the learning to learning about ...	designing learning activities in terms of concepts and procedural knowledge, the emphasis being on learning through ... and on learning for ...
valuing passive learning	valuing active and interactive learning
starting from the textbook and bringing little adaptation (if any) to the students' profile	starting from the features of the students from EPA schools and designing personalized learning paths
developing an abstract instruction, outside the context	contextualization of the learning, starting from the learning experiences of the students at-risk

Based on the contents of Table 1, presented above, it is obvious that the practices of teachers are not only a starting point for designing the meaningful learning but also the turning point in designing a learning of a different kind. The argumentation of this claim can start from the following fact: practices that support the meaningful learning involve a certain philosophy of the curriculum implementation that goes beyond learning about ... (which corresponds to a cognitive, informative level), involving also learning through ... (which corresponds to a level of participation, of active involvement), and learning for ... (which corresponds to a level at which learning is reflected in the promoted values, attitudes and behaviours). In a situation

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where the teaching approach stands only in the transmission of knowledge (focusing on learning about ...), it is obvious that learning does not target the possible implications for other types of behaviour (affective and attitudinal, moral and actional). Such an approach has as a consequence the simplistic design of the learning, its lack of relevance to real life, the student being unable to answer the question regarding the usefulness and necessity of studying that knowledge. The development, even at a minimal level of performance, of the competences specified in the national curriculum for Civics has implications in terms of methodology, involving new ways of organizing/reorganizing the teaching process which could optimize the students' learning, as such: using teaching strategies that focus on the progressive construction of knowledge and on the consolidation of capabilities; using of active methods by which the student is directly involved in the acquisition of the participation competences. This necessity to use active methods in the activity with students at-risk (focusing on learning through ... as well as on learning for ...), to achieve the provisions of the curriculum involves a paradigm shift: students learn participation by participating/through participation and not just learning about participation, which creates prerequisites for the transfer of these experiences in real life contexts. Continuing the argumentation, it is obvious that the design of the activity with students has to take into account the specific of the students we work with, their availabilities and concerns. This fact is targeting students in general, but is especially appropriate for students at-risk of dropping out and involves the development of personalized learning plans, which are related to the use of innovative methods. The curriculum has not to be either a constraint or an excuse for the development of less relevant lessons for the students we address; the curriculum allows teachers to choose the most appropriate way to make students achieve the respective competences. The curriculum is the working document of the teacher; even if the teacher is required to develop certain competences to his/her students, the way competences are developed depends entirely on the teacher. Actually, there are many roads going to the top of a mountain. Why should we not take into account this specific situation of real life and transfer it in designing the learning experiences? There are various "roads"/paths leading to the development of a competence according to circumstances, values, preferences etc. It is necessary that the teacher designs personalized learning paths; consequently, the learning path represents a unique experience for the student. It is a way to involve the student in his/her own learning and to build "the road", by "walking", construct the path of learning, by participating. At the same time, as far as the target is reached (the competence is acquired by the student) we can assume that at that moment, somehow, "the roads"/the learning paths meet. Hence, the major option in the development of the face to face training course is represented by the focus on a relevant learning for students, assuming: learning paths that take into consideration the needs of students at-risk, the features of students and their rhythm of learning; contextualized learning, active and interactive, the acquisition of knowledge being replaced by the construction of knowledge. At the same time, the option to support the formal education on the acquisitions of students in non-formal and informal contexts of education is based, on the one hand, on structuring the learning situations, starting from the experience of students, and on the other hand, on increasing the relevance of learning, from the real life perspective.

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The face to face training course included activities which were focused from the Civics perspective, on the following aspects:

- critical reflection on learning problems of the students at-risk and on issues which the students like in their activity in classroom;
- deconstructing didactic stereotypes targeting the students at-risk of dropping out (e.g. you can not work with these students, they do not know anything) by identifying the difficulties they face with in learning and by getting the awareness to design appropriate learning activities;
- contextualized approach of the official curriculum, taking into consideration: the needs of students at-risk of dropping out; the minimum performance level in the development of the competences set in the curriculum; learning situations that are appropriate to these students;
- practicing by the teachers of learning activities based on interactive methods of working, e.g., critical thinking methods which can lead to: the development of attractive and relevant lessons for students, active engagement of the students in their own learning, increasing their learning motivation and optimizing the learning of these students; this activity aimed that the teachers value the significance of the interactive methodology in the process of learning (Dumitru, 2000);
- supporting teachers to access and use the CIO-ISE platform, a necessary condition for the continuity of the training.

Online interaction with participating teachers is currently underway (website address of the online component of the training program is: http://training.ise.ro/course/view.php?id=215).

The two images presented below in Figure 1 show the training page of the EPA project in the school year 2012-2013, forums and resources for teachers of different specialties, including for the teachers of Civics.

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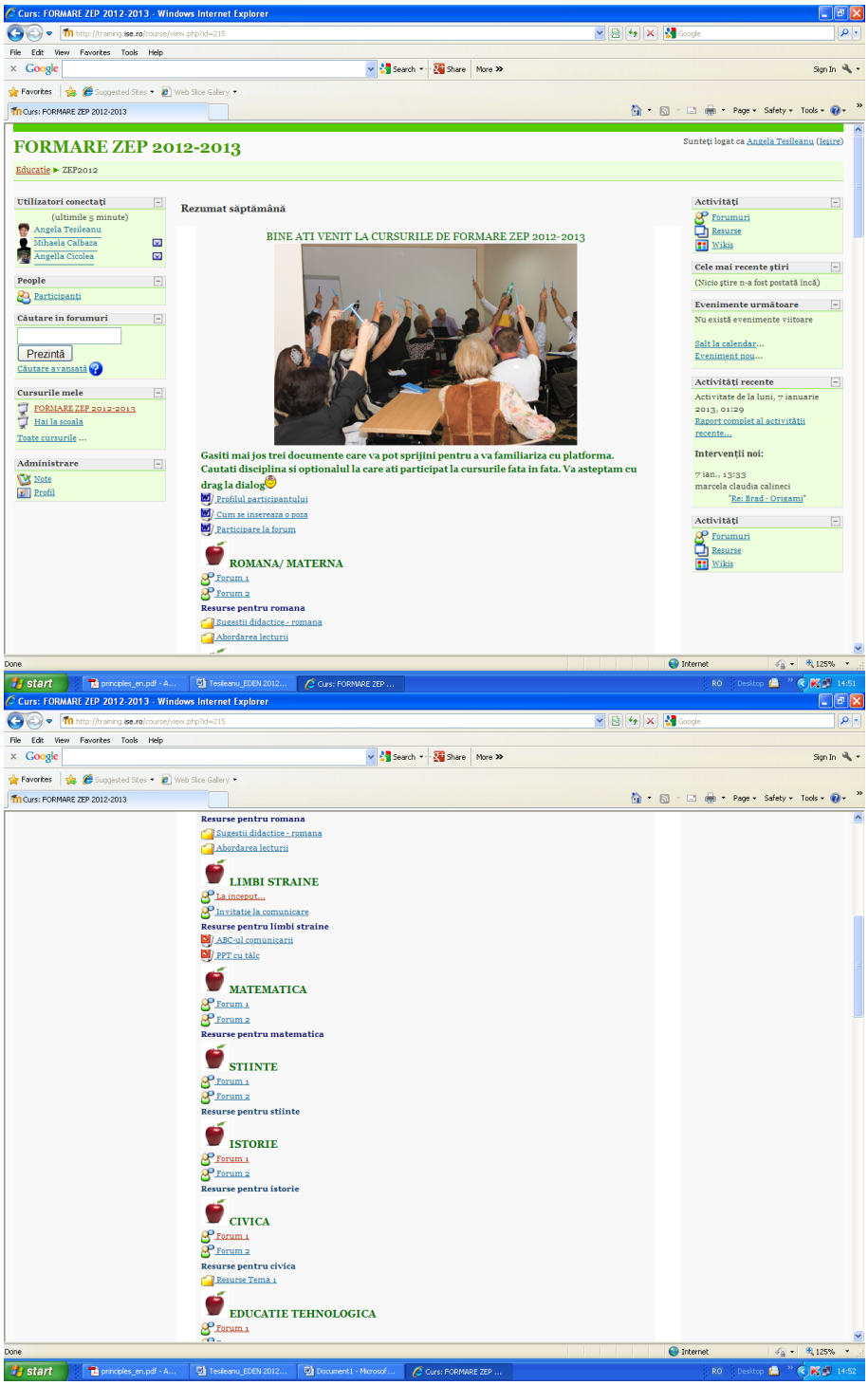

Figure 1. The web page of the EPA training program, which includes Civics

The online interaction with teachers participating in the training course was designed in the form of online discussions in a forum. Two topics were set for discussions: How could we design the teaching approach to Civics, so that the students learn through participation/by participating?; How can the project method be used in the activity with students?; the course requires that each of these topics are discussed with participants, for several weeks; for each topic resources are posted that can be used by teachers. Every day the trainer facilitates the online discussions that aim at improving the quality of the activity with students. Currently,

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the forum hosts the first of the topics (How could we design the teaching approach to Civics, so that the students learn through participation/by participating?). Participants in the training are asked to intervene on the topic, expressing points of view, giving examples of activities developed with students which focus on the students' participation.

The teachers enrolled in the course can access and use the resources posted as a reference for this topic. For example, one of the resource materials is targeting the students of grade VII and proposes a role-play which refers to a short fragment from the novel "The Paradise of Women" belonging to the French writer Émile Zola. This text, included in the resource material, provides the role-play scenario and refers to the confrontation for supremacy on the market, of Mouret, the owner of the store "The Paradise of Women" (general store, in the early days of this type of store) and Robineau, the owner of another store. The role-play goal is to identify and practice the type of relationship that exists between the two characters, Mouret and Robineau. The resource material presents the conditions for conducting the role play, being represented by assigning roles and ensuring the minimum conditions for the activity, as follows: a) main roles: Mouret, Robineau and the narrator; b) secondary roles: buyers; represented by students; they have the role to "migrate" from one "store" to the other, depending on price decreases for the silk offered on sale, c) the necessary scene to achieve the role play: two tables situated in two corners of the class expose samples of "the silk" which are put up for sale by the two entrepreneurs (in this respect, scarves of students/scarves brought by the teacher can be used); d) other necessary materials: labels (included in the resource material, for actual use) with the prices promoted by the two entrepreneurs. The resource material includes recommendations for the organization of the role play; so, the role play is preceded by the reading of the text, which is performed by the teacher (who can play the narrator role), to emphasize the elements of action; in this case, the teacher should manage and mark every meaningful moment of the confrontation between Mouret and Robineau; for example, the teacher has to emphasize the moments of successive reducing of prices and conduct the "wave of buyers", to entrepreneurs who practice at a time, the lowest price. The role play is followed by discussions with the students, based on the following questions/issues:

1. What is the focus of the text, the role play was based on?
2. What type of relationship is there between the two characters (Mouret and Robineau)?
3. Which is the context of this relationship?
4. Give an example of a positive consequence and an example of a negative consequence of the relationship between the two characters, for themselves or for the buyers.
5. If you were in the place of Mouret, what would you do in the confrontation with Robineau?
6. At present, is the type of relationship that you identified still obvious on the market? Why or why not?
7. Have you experienced the kind of relationship that we refer to, in other contexts, other than that referred to in the text? Give an example.

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Among the resource materials posted on the forum for the first topic in discussion, there are four worksheets, for grade IV group work. The worksheets have two sections: in the first section, students who work in groups have to identify the child's right which is illustrated by an image presented in the worksheet; in the second section, students have to perform, in order to illustrate the right identified, at their choice: a pantomime, a drawing, a game, a dialogue etc. The results of the groups' activity are presented to other students from the class, without mentioning the right they illustrate; starting from the presentation other students have to identify the right which is focused. The perspective which is reflected in the above learning activity is that of multiple intelligences theory; according to the theory, normal persons have, to some extent, each of the nine intelligences identified by Howard Gardner, but one person differs from another by the degree of development of the nine intelligences and by their specific combination (Gardner, 2006). At the level of work tasks, the students relate to a child right, but they may use different codes in solving the proposed task. The request, made in the second section of the worksheet can be exploited by the teacher in terms of developing multiple intelligences as far as he/she suggests that the students can illustrate the identified right, in different ways, choosing that way of expression which is the most suitable for them.

The online interaction with teachers participating in the training course, conducted so far, highlights several issues, as follows: interest for group activity, for active and interactive methods of working with students which can attract the students at-risk; preoccupation to involve students in concrete learning experiences; link with acquisitions/learning outcomes from other subjects. If we exemplify the above aspects, we notice the approach of concepts introduction (e.g. collaboration, competition) by making use of students' acquisitions from other subjects. This approach is in the spirit of the experiential learning cycle proposed by David Kolb which starts from a concrete experience and that continues with reflective observation, abstract conceptualisation and active experimentation (Kolb, 1984). In the given example of concepts introduction, the learning started with a small group task solved by the students (which involves an active participation); the next steps referred to the discussions on what was experienced, introducing the terms and using the terms in new contexts (for example in a role play or in analysing a case study).

While approaching the forum topic in discussion, the participants presented many examples of activities that were carried out in the classroom with a focus on students' participation, as a way of involving them in learning. One of the activities presented, which constitutes an example of good practice, refers to a class regulation, developed at the beginning of the school year, by the teacher together with grade III students from an EPA school. Beautifully written and illustrated, the regulation was displayed in the classroom for students to remember the rules of good behaviour.

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The regulation includes the following rules:

1. I listen, you listen to me. In the class we'll be quiet and we'll easily learn;
2. Keep the classroom clean and tidy. We'll easily find what we need;
3. I respect my word – I respect your opinion. We'll become real friends;
4. We find solutions to every problem. We'll avoid conflicts of any kind;
5. We help each other in need. We'll have time for our favourite activities;
6. We work without problems as a team. We'll succeed, we'll be happy together!

This example of students' involvement represents an item of good practice from several points of view: an approach that respects the school curriculum (the development, with the students' participation, of a regulation is an activity recommended by the curriculum); a product: the regulation is well done, it is concise, formulated in positive terms; it includes rules together with rules motivation; so, students follow rules, but the students have all the premises to understand the need of the rules, knowing the positive consequences of respecting them; as a way to bring it in the attention of students and valuing the result of the students' activity. The second topic of the online discussions with the participants to the course, "How can the project method be used in the activity with students?", develops the issue of students' participation approached in the first topic. The choice of this topic targets the advantages of the project as an interdisciplinary learning method. Among the advantages of using the project in the activity with students are the following: a) the students exercise the involvement, the participation; by participation, students inform themselves about a specific problem, relate to values, manifest attitudes, discuss with others, participate in decision-making in the working group they belong to (the class they belong to, the school or the community they live in), identify solutions and initiate actions to solve a problem, propose strategies to solve a problem, collaborate to solve the problem, assume responsibilities; by participation, the students have the opportunity to influence decisions at various levels but also to exercise their capability of action; b) involving students in obtaining complex acquisitions. The students construct meaningful knowledge, the information being connected with experience; they practice skills; in the same time, knowledge and skills are connected with emotions, values and attitudes; for example, the students' participation is a way to develop the students' care about their action, in fact, their attitude of responsibility for their actions. In this way, the project brings the learning by participation closer to the real life, the students obtaining acquisitions needed throughout life, in personal, social and professional life.

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Conclusions

From the previous experience of the EPA project, the results of the project at the end of each school year send a message of confidence, thanks to the problems solved or with respect to good preconditions for solving, in time, of other problems.

The training course for Civics presented in this article is ongoing. As for the stages that were completed so far, some important issues need to be highlighted with respect to the activity of teachers who work in the school year 2012-2013 with students at-risk. Thus, it is undeniable that the training activities conducted face to face at the beginning of the school year, but also the online discussions made the teachers to approach the learning design in another perspective (with "other eyes"), focusing, at least, on:

1. identifying learning problems of students at-risk and their needs;
2. contextualizing curriculum in the learning activities conducted with students at-risk and designing meaningful learning activities where the emphasis is on practicing basic competences and not on transmission/acquisition of contents;
3. valuing the potential of the students at-risk.

For the author of this article, the training course includes challenges and opportunities; the challenges are related to the need to focus on the quality of learning in EPA schools, even if the teachers face serious learning difficulties – students have minimum acquisitions and are often less interested in lessons; the opportunities are linked to the creation of real premises for change and for improving the learning activity in EPA schools; this is possible if the teachers assume the role of factors of change; this means a big change of the didactic activity, by using innovative teaching practices in the classroom, by transferring the positive experiences they get, by manifesting real care for the students they work with.

For the participants in the training course, the whole experience represents a fresh look to their teaching methodology, the selection of the topics from the perspective of students at-risk as well as an opportunity to revisit their own learning as connected to the students' learning. Briefly, the course is an example of quality learning for both the teachers and their students.

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SIMULATING INCLUSIVITY, BROADENING PERSPECTIVES

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Introduction

Although synchronous, networked learning activities have been popular since the 1980s, until the turn of the century, most were text-based. With the growth of synchronous audio- and audiographic tools over the last decade, environments supporting synchronous voice and shared workspaces have gained purchase.

At the Open University, UK, increasingly, face-to-face tutorials are being replaced with synchronous, online tutorials. While the use of such tools can be seen as more 'inclusive' allowing participation by those previously excluded by distance and the time involved in travelling to the nearest face-to-face tutorial. Many online distance learners, too, value the opportunity to communicate in real-time with their peers, as the interactions can be more spontaneous (McKinney, 2010) and there is the potential for increasing learner dialogue and interaction (McBrien et al. 2009). However, adult part time learners experience many external pressures (Callender & Feldman, 2009), so need the flexibility of study options that are available when they are able to engage, with opportunities to interact whenever it is convenient to them. With this in mind, relying on synchronous communication for an online learning activity could limit inclusivity, as some learners might find the time constraints impossible to meet.

The benefit of asynchronous media is that learners can access whenever they wish (Minocha & Thomas, 2007), hence, we argue, the design of a collaborative online activity should incorporate several options for engaging at times convenient for the student. Learners need the opportunity to use a range of communication tools in order to complete the task in the most flexible way for them but without being overwhelmed by too many options. If given free rein to design their own learning toolbox, students do not necessarily understand the landscape that they are attempting to construct (Valjatega et al., 2010), hence the tutor's role is essential in helping students to select the right tool to create an immersive learning environment (Bates, 2010) with opportunities for learning any place and at any time, using tools that they are comfortable with.

Within that learning space the facilitator's role is not central, more on the edge, as a subject expert, or mentor (Eijkman, 2010). The learners themselves have opportunities to develop their ideas in flexible ways, without set outcomes or expectations. Hence a diverse mix of approaches is required (Bates, 2010) and this change in learning approaches implies a necessary change in teacher-learner relationships (Haythornthwaite, 2008) Whereas 'traditional' learning techniques have a clearly defined pedagogy with the power emphasis on the teacher, students in both formal and informal learning environments are increasingly encouraged to take ownership of their learning (Sharples et al., 2010), moving towards andragogy, where learning tasks are determined by the teacher but directed by the learner.

In this paper, then, we argue that while synchronous technologies may increase immediacy and, perhaps, 'presence' for learners, they can also exclude by their very synchronicity. We present the outcomes of a piece of exploratory action research in which we investigated how a synchronous learning activity might be designed to:

1. promote inclusivity for those unable to participate in real-time;
2. encourage learners to take responsibility for their own learning in a secure and non-threatening environment rather than depending on the tutor.

The context

H800, 'Technology enhanced learning, practices and debates' is an entirely online module in the Open University, UK's programme for the MA in Online and Distance Learning (MAODE). This module makes use of the audio/videoconferencing tool, Elluminate to offer students synchronous 'tutorials', two sessions early in the module and two towards its end. Typical of MAODE students, participants in the compulsory H800 module are drawn from around the world and from a wide range of backgrounds, ranging from educators at various levels through industrial trainers and learning technologists to health professionals and members of the armed forces. Some work full time, some part time, some are unemployed. All are located at a distance from each other, their tutors and the institution. The international nature of the student body means that while the week in which an online tutorial occurs is scheduled into the timetable, the day and time are not specified, being arranged in relation to students' availability. Although synchronous tutorials are intended to offer an increased opportunity to communicate with fellow learners, we have observed that the nature of the module (distance, online and international) imposes various constraints on student availability to participate and, even when the same tutorial is offered twice in one week, a significant number may not be able to join. Technical difficulties also exclude students on a regular basis, while for those whose first language is not English, the dual effect of live English language-medium tutorials mediated via an often less-than-perfect audio-channel can increase anxiety and lead to non-participation. In other words, a tool that is intended to promote inclusivity may not have the intended effect.

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At the same time, the tutorials, follow a somewhat 'traditional' approach (Table 1).

Table 1: Initial design of Elluminate 'tutorial'

	Actor(s)	**Instruction**
Presentation	Tutor	Plenary session where students listen to tutor's introduction to readings/ask questions
Practice	Students	Small-group discussion to discuss set questions related to readings
Performance	Students	Plenary session to share views from small group discussion/ask questions about the module.

Tutorials are scheduled to last for about one hour with time after that for students to write up their notes/reflect on the experience. This, we believe may lead to a rather teacher-centred approach, the tutorial revolving around the presentation phase and learners focusing on the teacher's views rather than reflecting upon and discussing their own interpretations of the materials.

Redesigning for inclusivity: action research

Drawing upon experience of designing activities for learning environments that make use of flexible blends of tools and polysynchronous environments, such as text-based virtual reality, and upon our own participation in MOOCs, we designed a small action research project, redeveloping the original tutorial activity to one offering a range of tools, synchronous and asynchronous to increase participation and inclusivity.

In an attempt to investigate the two questions above, we adopted an approach that transformed the 'traditional tutorial' into a '*simulation globale*'.

What is a simulation globale?

Simulation globale makes use of a pedagogical approach used particularly in language learning and teaching. The learner is involved in creating a fictional identity through which s/he interacts with others in the scenario. As Lamy & Hassan, 2003, p.42) explain, the *simulation globale* "… may be played out over any length of time, from a weekend to a month or a whole year". Using their fictional identities, learners interact in a fictional setting in order to "...achieve collaborative projects… or to solve local conflicts…". Unlike most role-playing activities, then, *simulations globales* use a 'unified fictional but realistic framework' to address a range of learning activities. The approach adopts what Caprile (2004) refers to as "une pédagogie de l'imaginaire… Pédagogie de masques". If Bayne's findings (2005) concerning the anxieties experienced by students regarding their 'real' online personae have foundation, then we hypothesise that providing a fictional environment where students don 'masks' may reduce such anxieties and increase learner confidence, allowing students to engage with the materials and arguments through their fictional personae. As part of our second question above, then, we hypothesised that this approach would encourage them to take risks and state their opinions more willingly than they would in a 'real life' synchronous tutorial or discussion forum.

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Method

In 2012, two groups of adult, distance learners enrolled on H800, twenty in all, were invited to take part in a redesigned version of an Elluminate-based tutorial that occurred towards the end of the module. The topic of the tutorial was 'mobile learning'. In total, 14/20 students, located in six countries and three different time zones took part (Table 2).

Table 2: Distribution of participants by location and time zone

Country	Time zone	Number of participants (N=14)
Andorra	GMT+2	1
Canada	GMT-5	1
Ireland	GMT+0	1
South Africa	GMT+2	1
UK	GMT+0	9
USA	GMT-5	1

Redesigning for inclusivity

As described in Table 1, the original activity was solely Elluminate-based, taking the form 'presentation, practice, performance' with a short time assigned to make notes after the synchronous discussion ended before moving on to the next activity. In total, this was scheduled to take about two hours. Students who were unable to participate at the scheduled time were excluded from being able to share their views with others and did not have access to recordings as most of the 'practice' phase, the greatest part of the tutorial, took place in breakout rooms where recording was not available. The pace of the course – at 15-20 hours scheduled study time per week - means that students rarely return to discuss Elluminate-based activities in their discussion forums.

The redesigned activity took into account that some students would be unable to participate in the live discussion but might wish to discuss the topic. Over the space of three weeks, they took part in a *simulation globale* in which they took on the roles of members of a school governing body where a debate about the possible adoption of mobile learning by the school was underway. A volunteer was requested to fill each of the roles of Chair and Rapporteur/se and the remaining participants were assigned to groups supporting or opposing the proposition of the debate. Participants were then able to select whichever role they wished from a list (for example teacher, school administrator, technician/IT support, parent, student representative, stakeholder from industry, special educational needs co-ordinator).

Tools, learning outcomes and phases

The activity was designed to have four phases; each phase used a single tool or combination of tools (Table 3) to achieve the original learning outcomes and the outcomes outlined in the redesigned activity.

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Table 3: Phases and tools for redesigned activity

Phase	**Tool(s)**
Before Elluminate	Asynchronous and synchronous discussion tools, e.g. Skype, of students' choice Wiki space in pbWiki for supporting/opposing groups to develop their arguments.
During Elluminate	Elluminate used to allow supporting/opposing groups to finalise their arguments for the debate.
After Elluminate	Collaborative blog used to debate the issues and the questions raised in the original activity, namely: What evidence have you found that mobile devices are blurring the distinction between formal and informal learning? Is the 'ownership' of learning changing?
Closing the debate	Polling tool such as Doodle used to vote on the motion Blog. Closing statement from Chair and vote result.

The learning outcomes of the original task encouraged students to 'critically evaluate differing explanations and argument in the field of technology-enhanced learning' (H800 materials, 2012) by researching a range of formal and informal sources and participation in online networks and communities. The redesigned activity added learning outcomes relating to collaboration within and across tutor groups, working together in different learning environments, and employing both synchronous and asynchronous tools to achieve the activity's aims.

Although the Open University's Moodle-based virtual learning environment (VLE) offers blog and wiki tools, these are quite restrictive, so freely available Web 2.0 tools which offered learners greater functionality were selected. While this did mean that students might need to learn to use a different system, we believed this would be offset by the freedom to be creative. Choice of tool was, therefore, unimportant, but the functionality was paramount.

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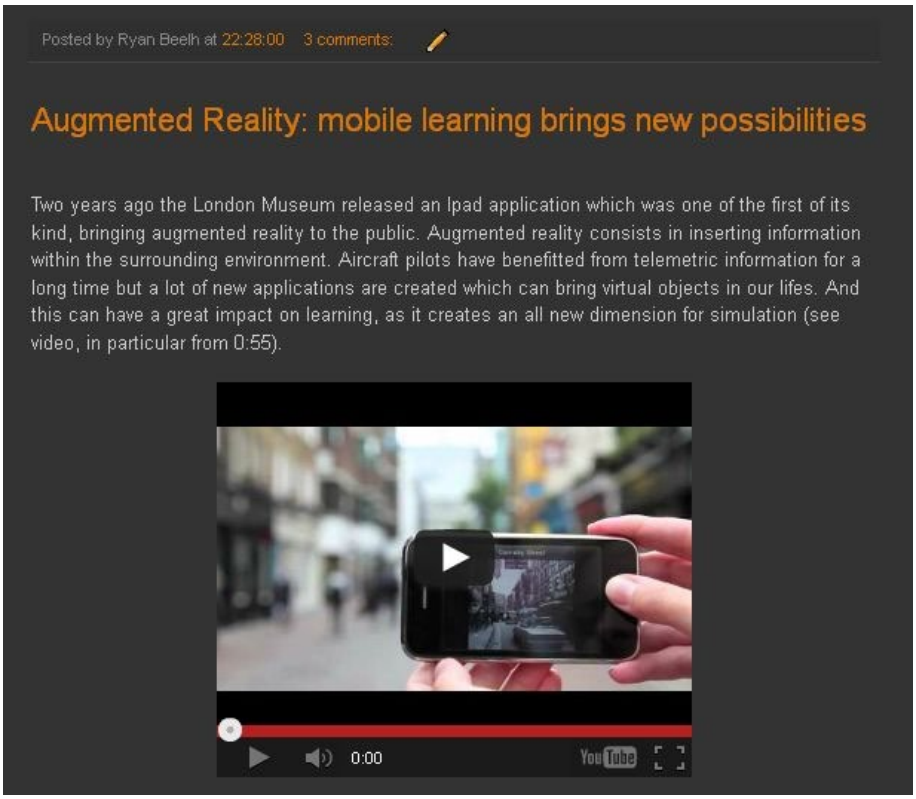

Figure 1. Blogger post example, image with text and added comments

As shown in Figure 1 above, students were able to add video links directly to the blog, as well as writing or pasting in supporting text. Other students were able to comment on the posts whenever convenient.

Data collection instruments and ethics

All students were asked to sign waiver forms to allow their contribution to the simulation to be used for research purposes. Both qualitative and quantitative data were collected. In terms of qualitative data, it should be noted that the majority of planning during the Elluminate session took place in the breakout rooms which cannot be recorded. For this reason, qualitative data comprises only the outputs from the wiki and the collaborative blog.

Data were collected via a survey after completion of the task, comprising of a mix of multiple choice and free-comment questions. All data presented in this paper has been anonymised.

While this was a very small, exploratory action research project, a large amount of data was generated, and, in this paper, the focus is on design for inclusivity and student-centred learning.

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Data analysis

Participants were asked specific questions regarding which parts of the activity they participated in. They were also asked if the tools used were appropriate for the tasks, whether the activity was explained clearly, and if the timing of the task was appropriate. Their views on adopting a persona for the activity were also sought.

Participation in the activity

Only six students indicated availability for the synchronous session, even though account was made for the various time zones and several different times offered. This was not unexpected, and seems to support our hypothesis regarding the need to offer flexibility in activities; survey responses suggested that time issues were the main barrier to participation, for reasons such as work and family commitments. The lack of temporal flexibility inherent in synchronous communication was highlighted in one response:

> *Whilst I enjoy the time spent in Elluminate, the thought of commitment to a specific time puts me off. (Student C)*

In contrast, the asynchronous activity in role on Blogger was relatively high over the three weeks the project ran. There were over five hundred views of the blog (Figure 2). Since the blog was closed so that only activity participants could access it and was hidden from search engines, it seems reasonable to assume that the majority, at least, of these views were by participants, particularly as no hits were recorded from geographical areas outside those represented by the students.

Entry	Pageviews
United Kingdom	423
South Africa	40
Ireland	30
Canada	23
United States	21
Andorra	15

Figure 2. Map of Blogger statistics, pageviews by country

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In all, there were 26 separate posts, many with multiple comments (81 comments in total). Ten embedded videos were posted, by 4 different students and 16 hyperlinks relating to the discussion topics were included, added by 9 different students. Such material was external to module-related materials and readings, suggesting students had carried out their own research to find these items.

Tools and timing

Participants generally thought the range of tools was appropriate for the task, although Student A noted, "*…the discussion forum might have been better so that a continuous dialogue was possible rather than individual posts [in the blog] which made the debate difficult to follow*". Students commented that the wiki was a suitable workspace for planning before the synchronous session and the Elluminate session worked well to launch the debate , although ideally they should have more time to familiarise themselves with the new tools (collaborative blog and wiki). However, the mix of tools did appear to address participation issues, while helping to meet the inclusivity requirements we had identified. For example, Student D commented, "*I thought there was a range of options for people to engage with and missing the synchronous discussion still meant that you could take part in the debate*".

Adopting a fictional persona

The students' adoption of a persona for the simulation was an integral part of the activity design, so their reflections on this aspect were sought. There is research evidence to suggest that adopting a persona allows the students more freedom to express themselves (Lamy & Hassan, 2003) and this was borne out in the responses from participants in the current study. For example, Student D felt able to be *"more outspoken"*, Student E enjoyed *"getting stroppy in character"*, while Student C suggested "*I don't think I said less or more in character, but maybe I was more aggressive and to the point than I would be usually*".

The learning experience also appeared to benefit from participants adopting a position contrary to their natural choice. For example, Student C noted that "*It was fun, but I was arguing against my natural position so this made it harder*". This suggests that the student may have reviewed the debate from both sides more fully and probably in a more balanced way than if reflecting from a personal standpoint. There is also further evidence to suggest that the learning experience is more stimulating if approached from a different angle, for example from Student B comments that "*…adopting a character to put forward arguments that I would not necessarily support works for me, so [in] that respect fun and interesting*".

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Conclusions and future directions

For this activity, we have created a multi-platform virtual environment that is sufficiently flexible for online, part-time, distance learners to fully engage, even if it not been possible for them to participate in all aspects of the debate.

Although the sample size is relatively small (20 students), this has given us the opportunity to review the activity in depth, and to gain a clear insight into the students' perceptions of such an activity. Although the notion of a *simulation globale* is new to most of the group, the responses gathered here support the notion that by adopting an online persona, students are more likely to engage in risk-taking by commenting freely on the more contentious aspects of a debate. They have also moved beyond the boundaries of the module-provided materials, researching and sharing resources to reinforce their in-character ideas, thus developing their abilities as independent learners.

We had intended to carry out focus group interviews once the data from the survey were analysed, but this proved to be impossible in the time available. The data analysis suggests that there are areas worth exploring outwith the questions considered here, such as how fictional personae interact and how online identities develop, Further iterations of the project will take this into consideration, ensuring that time is available for more in-depth interviews to occur.

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IMPROVING THE LEARNING EXPERIENCE: SUPPORTING STAFF TO SUPPORT STUDENTS THROUGH PROFESSIONAL DEVELOPMENT AND APPRAISAL

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Abstract

The quality and competence of teaching staff can have a direct impact on the student experience. Students report very different experiences from different institutions, for example in the UK's student satisfaction survey (http://www.thestudentsurvey.com) and other similar national surveys. However, teaching and other university staff need support and development themselves to ensure that they can provide the best possible student experience.

This article examines one way in which the Open University, UK (OU UK) has implemented a process of career development and staff appraisal (CDSA) for all its 11,000 staff over the last 20 years. (Both authors spent most of their working lives with the OU UK). CDSA involves a regular discussion between a member of staff and (usually) their Line Manager in which previous performance, current plans and future objectives and development are discussed. In addition to supporting staff, the process also enables the alignment of University, departmental and individual priorities.

The origins of the process, which initially involved a relatively informal discussion between a member of permanent salaried staff and their line manager, are outlined and the issues and principles that arose are discussed. In the 1990s CDSA became a more formal annual process for salaried staff with documents and procedures agreed between University management and the University and Colleges Union (the negotiating body for University staff terms and conditions in the UK).

In 2010 it was agreed that CDSA should be extended and implemented for all the University's 7000 part-time tutors (Associate Lecturers – ALs) by 2012, and the paper discusses the issues that arose and the very positive feedback received from an external evaluation of the experience of early adopters in February 2012. It is hoped that data from an evaluation in early 2013 can be included at the conference.

The CDSA process raises a wide range of issues about how staff can best support students and the quality of their learning, and how institutions can best support staff and their development. Information and issues arising from the process and evidence from evaluations

will inform discussion at the conference and some questions are included at the end of the paper.

Introduction

In the early years of the OU UK, there was little guidance about how staff should be managed and supported. For example, until the late 1980s, staff were not expected to meet formal objectives and there was no process, even in rudimentary form, known as 'appraisal'.

In 1981 when one of the authors became a regional director, he introduced a very informal and voluntary discussion process where academic and administrative staff were invited to set down their achievements, plans and hopes for the future. This experience led to the establishment of a part-time post nationally of *Vice-Chancellor's Delegate for Career Development Transfer*. The idea behind this was to provide staff with opportunities, outside the formal line management structure, to discuss their career plans which might mean investigating opportunities outside their current department. In the event, by far the majority of staff using this service were administrators wishing to become academics! – which was, perhaps not very surprising.

Arising out of these initiatives the University's Human Resources department (then known as Staff Services) began a series of consultations which eventually led to the establishment in the early 1990s of a formal, University-wide process of Career Development and Staff Appraisal, (CDSA) for salaried staff. Finally a system had been introduced which in theory enabled individual, departmental and University objectives to be aligned. It also, controversially, included elements of appraisal which, although not formally linked to decisions about pay, were seen by some to mirror too closely for comfort similar processes in business and commerce.

The introduction of this process also highlighted weaknesses in the University's overall management structure, revealing uncertainties as to where formal line management responsibility lay, the frequent occurrence of 'dotted line' links between staff and several managers. The highest level expression of this confusion lay in the roles of the Pro Vice-Chancellors for Academic services and for Learner Support. Here the University operated like a government department with the Pro Vice-Chancellors having a policy role, not unlike elected politicians, and others are having executive responsibility for day to day management. In due course structures were changed to eliminate such anomalies leading to the much clearer structure extant today.

Confusion remained, however, in relation to the line management of the University's 7000 part-time tutors, who might have several regional managers – for example if they taught across faculties or regions, they would have one manager per faculty or region. Tutors had not been included in the process initially but in 2010 it was agreed that CDSA should be

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introduced for all tutors by 2012. The rest of this paper discusses the introduction and evaluation of the experience of early adopters of CDSA.

What is CDSA?

In the OU UK CDSA provides the opportunity for a structured discussion on an annual (internal staff) or biennial basis (tutorial staff) between a member of University staff and their line manager.

Supporting documentation (the CDSA Record) is completed during and after the conversation and will be reviewed between CDSAs. The documentation for tutors is slightly simplified but essentially the same as for internal staff and contains several sections:

- A review of activities since the previous CDSA – what has gone well, what has not; which objectives have been met and any difficulties that arose.
- Objectives for the next period; this provides an opportunity to relate individual plans to wider University priorities such as student support and retention.
- Development needs for the future in order to enable the tutor to meet these objectives and any career plans.

However, there are a number of key differences between CDSA for internal staff and part-time tutors, in recognition of their particular role within the University:

- CDSA is biennial rather than annual. This is partly in recognition of the part-time nature of tutors' employment and also in recognition of their managers' workloads in the early stages.
- The conversation is increasingly undertaken by telephone, Elluminate, email and so on rather than face-to-face, as is the usual practice for internal staff. The aim is to have at least one meeting, if the tutor wishes to do so, but thereafter to rely on other media. This is largely a practical consideration but is preferred by many.
- A list of six activities, which have been agreed by Unions and Management, form the basis for reviewing the previous year, and these are all available to both tutor and manager in the same format online, so that both can look at the same information. This is discussed further below.

Professional development for part-time tutors

Professional development for all staff in the OU has a threefold purpose; expressed in terms of a tutor's role this is:

- To enable tutors to support students in the best possible way;
- To support tutors' own development;
- To support wider University objectives (Gaskell, 2013).

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Open University tutors have a vital role in supporting their distance students. Indeed tutors' actions can affect students' retention and perceptions of their whole course of study. In an analysis of responses from over 400 students, Richardson et al concluded that "the role of course tutors in supporting academic engagement was crucial to the students' perceptions of the academic quality of their courses" (Richardson, Long & Woodley, 2003, p.223). The professional development of these tutors is therefore key to ensuring they are well supported in their work with students.

The Open University provides a wide range of professional development opportunities for part-time tutors. These include a series of printed "Open Teaching Toolkits" developed in the 1990s, which focus on particular areas of development for tutors such as correspondence tuition, or becoming a reflective practitioner. The latter, *How do I know I am doing a good job?* (Hewitt et al., 1997), was one of two Toolkits which all tutors are expected to read. More recently a range of online resources and courses have been developed to support tutors with their work in online environments (Gaskell, 2013; Gaskell & Mills, 2007).

However, professional development is not effective when based solely on resources, single events or one-off courses; to ensure it has an impact on professional teaching and learner support, development needs to be supported by ongoing discussion (Prebble et al., 2004). Similarly, student feedback by itself is not enough to improve teaching: it needs to be mediated through discussion (Brennan et al., 2006).

The CDSA process is designed to meet both these requirements, by providing a regular opportunity for a formal structured discussion and ongoing review.

The Introduction of CDSA for part-time tutors

The agreement that CDSA should be introduced for all part-time tutors by 2012 was a major undertaking, given the large numbers of tutors (7,000) and regional academic staff involved (360), the lack of clear management structures, the need for some agreed activities for review, and the changing academic climate over the period which had an impact on professional and career development opportunities. It was therefore agreed to introduce CDSA in stages with three rounds of early adopters: autumn 2010, spring 2011 and autumn 2011, with CDSA rolled out to all tutors in February 2012.

An early major task was to agree a set of activities which could form the basis for the review of a tutor's performance and which were to be displayed on the *Associate Lecturers' (Tutors') Activity Review* (ALAR). After negotiation it was agreed that these would be:

- Monitoring of assignment marking: between one and three from most 'batches' of 25 or so tutor-marked assignments are selected for review by a fellow academic who reports back to the tutor's manager;
- Student feedback: the OU regularly collects feedback from all students in a tutor's group on their experience of their tutor;

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- Assignment marking turnaround times: tutors are expected to mark assignments within 14 days of the expected submission date or date of receipt, whichever is the later. Data already available enabled the ALAR to display the number of assignments that had been marked within 7 days, 14 days or over 21 days;
- Reports of tuition visits by the tutor's manager, whether undertaken face-to-face or online;
- Staff development activities undertaken by the tutor;
- Reflections by the tutor on any of the above areas.

The first three items were relatively straightforward to display on the online interface because the information was already available, used identical formats across Faculties and could be drawn from other systems (assignment handling, student feedback). However there was no single form for reporting tuition visits across Faculties and so this area had to be simplified to provide only information about the date, medium, module visited and the location of the final report. And while it was relatively straightforward to display information about staff development information that the OU held – for example OU events attended – it was not possible to include easily the many other forms of development outside the OU which are relevant to the tutor's role. It was therefore decided to have two free text boxes for the final area: one for additional staff development which did not appear on the current record, and one for any comments the tutor might want to make.

The second main area to clarify in the early stages was the identification of a single line manager for each tutor. As noted above, a tutor might have three or four line managers in different Faculties, regions or relating to different modules. In the first place, an algorithm was developed which allocated each tutor to the one regional academic for whom they did the most work; or if they did equal amounts of work for two managers, to the one who first appointed them. Faculties were able to change these initial allocations to ensure that some regional academics were not too heavily overloaded but this could involve a considerable amount of work.

The third major area of activity initially was to publicise and explain the introduction of CDSA and gain "buy-in" from a wide range of stakeholders. While most people broadly welcome the extension of CDSA to tutors in theory – tutors for example, considered it would give them greater parity with internal staff – there were many concerns in practice. Among these:

- Some tutors were concerned that this was just a way of introducing a system of appraisal and would probably lead to performance related to pay; or was linked to disciplinary procedures or redundancy (there is no connection to any of these – the later two are covered by completely different procedures).
- Regional academics were concerned about workload implications at a time of considerable change in the University. One of the issues that surfaced was that regional

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academics had very uneven workloads and Faculties were obliged to engage with reviewing this area.
- Regional academics also needed support in undertaking CDSAs and suitable training was provided.
- There were also a number of concerns about the changing culture of academia: were regional academics now expected to be managers rather than academics? And was CDSA for tutors a way of checking up on their manager's performance too?
- There were a number of specific issues, such as, how many is a reasonable amount of CDSAs for one person to undertake in a year? How frequent should a tutor's CDSA be? Who will pay the travel expenses for any face-to-face meetings? – all of which needed resolution before full roll-out.

In the event, the engagement of early adopters with CDSA was encouraging. Regional academic line managers were given the opportunity to opt in to one of the early presentations and around 70 did so. Their tutor groups were automatically included but were allowed to opt out if they chose to do so at this stage (while recognising that they would be expected to engage with CDSA from February 2012). Only a very few of the (potentially) 800 tutors involved took this option.

Evaluation of CDSA for tutors

An external evaluator, Professor David Baume, was invited to design a SurveyMonkey questionnaire for both tutors and their managers and to analyse the results. The IT team responsible for developing the ALAR also provided an interface for logging when CDSAs had taken place and this triggered the sending of the survey to the individuals involved. The following information is drawn from the survey results (Baume, 2012).

This internal report is based on 312 full or partial responses, based on 225 CDSAs which had taken place by February 2012. These represent individual responses from 159 tutors – while their managers could, if they wished, fill in a survey for every CDSA they undertook, so there are 153 manager responses but these may not be from individual managers. Overall, Baume concludes, "the new CDSA process is being very well received. Some 80 % of AL (tutor) respondents and 94 % of manager respondents are mostly or very satisfied with the new CDSA process" (Baume, 2012).

Among other points, respondents were asked about the three main areas for CDSA:

- Reviewing your/your tutor's work: 90 % of tutors and 94 % of managers thought the process had been mostly or very effective;
- Setting objectives: 84 % of tutors and managers thought the process had been very or mostly effective;
- Agreeing a development plan with appropriate actions: 83 % of both tutors and managers thought the process had been very or mostly effective.

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Both groups of staff were invited to include free text comments in all sections of the survey and these provide very rich information.

Some concerns were raised, many of which related to the changes in the UK Higher Education climate and OU developments. These for example, included the belief that it was time consuming, difficult to find develop opportunities within the OU for excellent tutors, lack of willingness to engage, and lack of career opportunities within the OU for tutors, particularly during times of major change.

More positive points include:

> *"It allowed an opportunity for me as an AL [tutor] to reflect on the year, the progress made by me and my achievements during this time. It also allowed me the opportunity to ask my line manager for additional training in certain areas".*
>
> *"It provided a real opportunity to reflect and take stock and encouraged me to think constructively about my role within the OU present and future. It provided an opportunity to reflect on my tutoring practice, to acknowledge what I do well and to identify where I can make improvements".*
>
> *"It also encouraged me to look at particular issues and the professional tutor / student relationship and think about ways in which to improve and to support students experiencing difficulties or struggling to engage".*
>
> *"I think the interview gave us the opportunity to spend a little time one-to-one focussing on the broader picture of an AL's [tutor's] work. Usually when I meet with an AL it's for a tutorial visit or staff development when it's not always possible to have a lengthy conversation about the AL's career".*
>
> *"It gave me the opportunity to assess all the work my AL does for her students, her own development and with the course team. It is not always evident until it is written down just how much involvement an AL has with the different levels of engagement".*
>
> *"It's the fact that time is allowed specifically for this that makes the whole process so positive. You can think about it more systematically than you would do if the facility was not available".*

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Conclusion

Feedback from the early adopters and the initial evaluation is very encouraging and enabled a number of changes to be made to the CDSA process for tutors; for example to include two rather one free text boxes. However, it is still relatively early days and it will be important to evaluate how the process is received as it is rolled out to all tutors from 2012 - 2014. There is evidence from some of the feedback that the process is encouraging tutors to reflect further on how they can review, and possibly improve, their support to students and so improve the student experience.

Discussion points

1. The OU UK has linked career (and professional) development with staff appraisal through the process of CDSA. Is this a helpful combination? What benefits or disadvantages could it bring?
2. Is there a cultural shift towards greater staff management by academics? What impact does this have on academics?
3. How far are academics able or willing to provide support to their staff in relation to career development?
4. Should academics receive management and leadership training when they take on management roles?
5. Many staff in Higher Education have been familiar with managing colleagues face-to-face. What is the potential for using new technologies for support and management at a distance? Does one face-to-face meeting help?
6. What further evidence is there that professional development improves teaching, and that this itself improves the student experience?

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LEARNERS' EXPERIENCES ON ONLINE TUTORING: PEDAGOGICAL AND PSYCHOLOGICAL ASPECTS

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Introduction

Online tutoring involves more than a simple exchange of information between the online tutor (OLT) and the learners. It entails a series of interactive exchanges of a pedagogical nature that demand different roles from the online tutor together with the use of a variety of teaching strategies depending on the type of task, the type of interaction and the type of learner. While there is a vast amount of information related to the types of interactions that take place in online courses (Bonk and King, 1998; Hirumi, 2006) and how these interactions build up online communities (Goodyear, 2002), little has been researched about the online learners' experiences regarding online tutoring (Lim & Cheah, 2003) particularly attending the way in which learners view the pedagogical, affective and emotional support received from their tutor during a course (Contijoch, 2009).

This paper, aims to show findings of an exploratory case study where online learners (OLLs) expressed their views on how they perceived the feedback received during an updating online diploma course in Mexico (Contijoch, 2009). However, views on pedagogical and affective features regarding the performance of their online tutors (OLTs) inevitably emerged.

Literature review

The advent of new technologies in the online learning environments and its rapid development brought the need to create terms that could define the new roles of the teacher's figure. We find in the literature, terms such as e-tutor, e-moderator, e-facilitator, online tutor, and some others. While terminology is important, it is even more relevant to recognize that adequate tutorial support is essential for successful online learning (McPherson & Baptista, 2004; Henninger & Viswanathan, 2004). From the pedagogical point of view the online tutor is an educational facilitator who is able to provide input, and/or focus the discussion, ask questions and respond to the learners (Ryan, Scott, Freeman & Patel, 2000). Visser (1998) sees the tutor's role from a psychological perspective stating that he/she acts as a motivational tool that supports the learning process. García-Aretio (1994) notes that the role of the tutor is that of a *counsellor, a guide*, defining this concept in a more affective sense. The tutor is also an *academic figure* who has to deal with the cognitive aspects related to the subject area of the

course and he is also the *liaison* between the institution as a whole and the participant. Denis, Watland, Pirotte and Verday, (2004) propose a wide range of roles which need the development of a series of competencies including content facilitator, metacognitive facilitator, process facilitator, advisor, counsellor, resource provider co-learner, assessor and technologist among others.

On the other hand, various aspects of the online learner have been described by different authors who have approached this topic by studying issues such as: demographic characteristics (Tekinarslan, 2008), motivation (Teng, 2008), learning styles (Offir, Bezalel & Barth, 2007; Young, Hausler & Sanders, 2008), perceptions of online learning (Song, Singleton, Hill & Koh, 2004), satisfaction with the online experience (O'Leary & Quinlan, 2007), opinions on the quality of learning (Chaney, Eddy, Dorman, Glessner, Green & Lara-Alecio, 2007), participation in the online environment (Chan & Waugh, 2007), and performance (Carbanaro, Dawber & Arav, 2006) among others. These various research studies suggest that there is an increasing interest in the ways online learning is making an impact on the students who enrol in courses, and certainly benefit from this learning modality. Priest (2000) suggests that the online medium is not for everybody, as the features of the online learning environment require certain characteristics of the OLL. Dabbagh (2007) mentions that some of the characteristics of the emerging OLL include a skilled use of technology, possession of good interpersonal and communication skills and the acquisition of self-directed learning skills to mention a few.

It is noticeable that while the characteristics of both OLT and OLL are important, it could be argued that it is the OLT who needs to create the appropriate conditions for learning to take place. The OLT needs to consider not only how to deal with the technological features of the platform he/she is using but has to cater for the wellbeing of the virtual community so as to be able to provide a meaningful learning experience for the learners. Therefore, it seems important to know what learners perceive about the OLTs' overall performance since it can provide insights about the effectiveness of their support as well as its quality.

The study

Sixteen OLLs participated in the study. They are all language teachers (10 Mexican, 6 French and one Mexican-Argentinean) who took the online module "Evaluating Processes in Language Teaching" for updating purposes. The module lasted 12 weeks. Participants completed four units that involved a total of 20 learning activities including the final project that was developed during the course. Two OLTs were in charge of the course and each of them moderated eight participants throughout the course. They provided group and individual feedback to learners after each of the activities in an asynchronous way and accompanied them along the course. The data reported in this study are based on the results of sixteen questionnaires and 16 subsequent interviews given to all participants. Both instruments were piloted to ensure their validity and experts' suggestions were followed (Dörnyei, 2007; Denscombe, 2003) to guarantee that all the questions were clear. All learners

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participated on a voluntary basis and in order to maintain participants' anonymity their names were substituted by numbers.

Findings

Two main themes emerged from the data obtained in the study. OLLs focused the answers related to the OLT's performance on pedagogical and psychological aspects. Regarding the former, OLLs agreed that the tutor's feedback is an essential element in online courses and should be present throughout the course. They see feedback not only as a way to praise learners' work or point out learners' weaknesses but view the tutor as a guide and as a provider of new information. OLLs added that the feedback provided by the tutor helped them to reshape their thinking and construct knowledge. In this respect, OLLs view in the tutor the content expert and therefore expect him/her to be knowledgeable, being able to answer doubts and to provide extra resources when needed. Furthermore, participants expressed that they expected timely, specific and relevant feedback after each of the activities they developed. These last aspects coincide with the characteristics of good feedback mentioned by Brinko (1993).

Another pedagogical aspect that emerged is that of the formative side of feedback. OLLs did not see feedback from the behaviourist perspective but rather as an integral part of the learning process where tutors and learners participate, create, interact and as one learner put it "*walk together in order to achieve a common objective*" (OLL14). This opinion coincides with Mercer's (2000) sociocultural view of learning in that it suggests that both tutors and learners created a *"shared communicative space"* where they learn together (p.141).

Another aspect that deserves to be mentioned is related to self-regulation. OLLs mentioned that feedback helped them to enter into a process of analysis and reflection which helped them not only to identify their strengths and weaknesses but also to maintain "action control processes". These, according to Corno and Kanfer (1993) are "the ways in which students allocate and control their attention and enlist techniques for self-motivation and handling intrusive emotions" (p.304). In other words, OLLs activated a series of strategies that enabled them to keep working throughout the course and to achieve the final goal. This could also mean that the OLT provided adequate support at the right moment, which helped the learner to maintain his/her interest in the content of the course.

In relation to the methodology employed by the OLT learners identified two main approaches: the directive approach and the constructivist. Their comments indicate that they perceive that OLTs are very directive when instructing, as for example OLL7 describes how the tutor would instruct him in this extract: *"Look for this article, go to this site, read this, reformulate that"* which shows the awareness of the OLL of the authority that the OLT displayed. In spite of the OLTs' directness, most OLLs did not comment about whether this directness was perceived as too offensive or too blunt. This is the type of comments OLLs made:

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> *"Yes, I remember that the tutor pointed out the positive things of my work and very subtly the tutor also pointed out what was missing or asked me about the relevance of a particular issue I had raised…. I felt it was like an invitation for me to reflect rather than just pointing out my weaknesses" (OLL5).*

By saying this, the learner recognizes that he needed to improve his work and in a way accepts the OLT's suggestions without complaint.

As for the constructivist approach, the OLLs recognized that the OLTs made use of strategies which aimed to guide, question and/or promote reflection as this learner expressed:

> *"The tutor was specific, ... he would take bits of my work and then he would say… "I see this, but you see that, ... what do you think?... He wouldn't say "this is wrong" and "that is right".*

For this learner, the approach followed by the OLT was adequate as his remarks provoked reflection as the OLT questioned the learner's point of view. Another OLL expressed the following:

> *"The tutor would question my proposal without saying explicitly that it was incomplete… but he put it in such a way that I realized it wasn't complete…. So… I had to decide what was missing,, and how to integrate it in the activity" (OLL11).*

The OLT's questioning strategy worked with this particular learner, as he was able to fulfil the objective.

The concept of mediation which is an important aspect of the socio-cultural theory (Vygotsky, 1978) was also reflected by the fact that most OLLs acknowledged the value of peer feedback as a way to complement and enrich the course as this learner suggests:

> *"There was a discussion where we provided feedback among ourselves and that was very good because we would make comments like 'This particular thing that you say here, well, I didn't get it, could you explain a bit more?'.... or.. 'How do you apply this in the classroom?' and that was so good" (OLL12).*

One aspect that obtained a very high percentage of agreement was the one related to netiquette. OLLs reported that both OLTs were polite and respectful during the course even when OLTs' comments were not positive as this learner expresses

> *"I'd send my work and she'd say...'This is right and this isn't'. Then I would reply telling her that I'd do my best to improve it" (OLL4).*

Regarding the psychological aspects that OLLs perceived during the course, learners addressed three main issues: motivation, the emotional and affective side of OLTs' feedback and the relationship with the tutors. Regarding motivational messages, OLLs perceived them

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from different perspectives depending on their personality and individual differences. For example, this OLL refers to motivational messages as essential:

> *"The tutor sent motivational words that showed her concern about my work. They are essential as they reduce the desire that sometimes one feels to abandon the course" (OLL8).*

For this learner the motivational messages probably helped her to maintain herself 'alive' in the course. For another learner motivational messages helped him to reassure his confidence as he mentions:

> *"They helped me to keep my self-confidence and to know that I was doing a good job" (OLL6).*

It can be said that motivational messages fulfil a purpose and some OLLs appreciate their inclusion, especially when they are most needed.

For other OLLs motivational messages were welcomed as they meant that the OLT was there for them as this learner expresses:

> *"The tutor said: 'I read your work and I see that you're making progresses "That helped a lot. He also promoted a good relationship among all of us in the discussion room. Motivational messages are important because you don't have the person in front of you, you're somehow on your own" (OLL12).*

However, there was one participant who thought that motivational messages were not important for her:

> *"I cannot say much about this point due to my personality. Even if my tutor sent motivational messages I didn't care much about them. I like to be concise, practical. It's not really important for me to receive mails with things like 'come on, you're doing fine'… I just get stressed when I see too many messages in my inbox" (OLL5).*

This learner could serve as a good example of differences in individuals and also her ability to maintain her own self-regulation mechanisms. She seems to be a very determined type of person who has set an objective and she will fulfil it with or without the OLTs' motivational messages. Further research in the area of motivation in online courses is suggested as most OLTs may also regard motivation as an essential element of any course.

In relation to the emotional and affective side of feedback OLLs' comments evidenced their openness in expressing positive and negative emotions towards feedback. This learner expresses her views on the severity of the feedback received and her reactions:

> *"At the beginning, I felt that the feedback was very severe, very cold. I was not used to receiving criticism about my work. As the course developed, I*

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> *understood that it was not severe as such but it was a constructive kind of thing…. And I realized that it was for my benefit and then I realized that even the way I was teaching changed. Later on, I got used to it and then my reactions changed… I would say 'Oh yes, this is missing, she's right!!" (OLL7).*

This learner experienced a difficult time at the beginning of the course and suggests that her self-esteem was lowered by the impact of feedback received. However, she realized the positive aspects of what she called "*a constructive kind of thing*" and how her teaching involved changes, which she was able to notice. In this case, feedback had an impact, which was reflected in a change of behaviour (usefulness of feedback).

Other OLLs described they experiences after they had submitted their assignment and the way they felt while they waited for the tutors' feedback. Anxiousness, anxiety and worry were emotions expressed in the OLLs' comments as for instance this learner mentions:

> *"At the beginning it's like if you're afraid of opening the mail. And… I said to myself. 'What if I did it all wrong? And he is going to ask me to rewrite it!! Oh no!!... or I'm going to wait three seconds and I'll open the mail to see what he has to say.' I was always expecting very bad news" (OLL12).*

This comment reveals the strong level of emotion involved in the process of feedback. One of the immediate reactions when receiving feedback is that it will be negative as this learner mentions.

OLLs also referred to the types of interactions they experienced on an individual basis with the OLTs. They mentioned that these were initiated by the OLT or by them depending on the task at hand and on the purpose of communication. Most of them described the relationship with the tutor as informal and friendly as this OLL expresses:

> *"Communication between us was excellent!!... I would say directly to her 'How do you see this?'… Or… 'What do you think if I develop this idea?' and she would say 'Yes, go ahead!!' (OLL1).*

This learner established good rapport with the OLT and felt confident to initiate communication with her when needed. This was not always the case. Another learner describes his relationship with the tutor as follows:

> *"I wanted to do a good job in the course. However, I felt that there was a personal problem between me and the tutor. I felt bad about that. He would always say positive things first and then the negative aspects. He would say 'you're doing fine, it's a good job but…. You need to change this and you need to complement here and there'"*

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For this OLL the tutors' comments did not meet his expectations as he appears concerned about the negative comments, although he does admit that the tutor always replied and provided feedback.

The various aspects described in this study reveal the importance of the different roles OLTs perform considering the pedagogical and the psychological perspectives. Based on the data obtained, it is clear that an adequate use of language is essential since unclear messages may cause misunderstandings between participants.

Final reflections

This small-scale study has shown only a few aspects of online tutoring. The pedagogical aspects mentioned (tutors' methodology, use of strategies, teaching approaches, provision of feedback) need to be addressed in more depth since they might be underestimated in an online environment. OLTs need to be aware that their performance acquires distinctive features that are determined by the medium and in consequence, make the learning experience different from the face-to-face situation. As White (2000) suggests, one of the challenges for OLTs is the management of human interactions in the virtual classroom. OLTs need to fulfil both a pedagogical and a communicative purpose in order to achieve common understandings. It is necessary to work on the promotion of constant communication in order to achieve high levels of learners' engagement with the OLTs with other learners and with their own learning process. The degree in which learners get involved with enriching learning experiences translates into high quality learning as Coates (2005) acknowledges.

It is also important to consider the role of motivational messages and when and how to deliver them. The OLT is responsible to maintain the OLLs' well being, self-esteem and sense of accomplishment. Probably, a more active role on the OLT's part in the assurance that these elements are present is needed. Finally, any OLT involved in the delivery of a course should reflect on his/her pedagogical practices and think of ways in which he/she can make the learning experience more meaningful, rewarding and memorable for learners.

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A NEW INDIVIDUALIZED ON-LINE LEARNING EXPERIENCE

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Introduction

Assessment carried out on learners' competencies at their key stages throughout their education has a profound leverage on distance learning systems efficacy. One of the most important aspects of evaluation and monitoring of students in distance learning is the content of the teaching materials and how it is presented to learners. The research project Orbis Dictus, implemented by the Department for Educational Design (DiPED) of Roma Tre University, has as its main aim the representation of an innovative way to deliver an automatically adapted e-learning material based on lexical statistical computation and measuring relevant educational competences such as reading comprehension. The project outcome should involve developing a new technological model for learning interaction applied to new technologies. We are trying to design a tool useful for every learning need while focusing on the learning approach at the same time. In other words we created a complete, functional and user-friendly technological model for learning interaction (teacher and student friendly).

This paper provides an understanding of some tools when put together will form a functional and efficient automated system that starts with a test creation tool (LexMeter), a progress monitor (ProgressMeter) and a text modulator / adaptor (Adapter) that delivers a document tailored to the individual's needs based on his performances on the previous tests that help giving the system a better understanding of the student's lexical knowledge and adapt the course materials accordingly.

Estimation, monitoring and modulation

Reading is one of the basic skills in learning and often, it could represent the main way of learning in distance education courses. In order to obtain an outline of the potential reader in a distance course, we identified in the first place the *virtual reader* profile, i.e. the optimal level of verbal competences needed to comprehend texts presented in the course (Agrusti & Vertecchi, 2007, p. 119).

Hence, the underlying idea is that linguistic formulation of the messages offered to the students during the course is one of the most important characteristics in distance education (Agrusti & Vertecchi, 2007). The *Orbis Dictus* model is considered innovative also for its

capacity to adapt the message according to the learner's progress as it takes into consideration his/her lexical competence as one of the major factors to determine the efficacy of the message delivery.

Moving from virtual reader profile towards real reader profile is an extremely complex process. It consists at least of two main phases. The first one is to estimate the number of words in a given student's word box. The second one is focused on increasing this number through a modulation of course texts. These two phases are conceptually tied together in a completely automated way.

Orbis Dictus electronic platform represents the environment into which it is possible to integrate the entire process in a new Learning Management System for distance education, we designed and developed three applications in order to achieve three main objectives: to identify the level of knowledge in lexicon of a given learner (how many words are in the word box), to evaluate its intermediate changes during the learning process and to modulate the didactic material (e.g. a text) to bring it to a slightly higher level than the previous one.

To achieve this goal, we started from the following hypothesis: *the lower the word frequency of word taken out from the text, the higher the difficulty of the cloze test*. Thanks to this process, the learner could easily use the adapted material (e.g. reading the text) but he/she will found some points (e.g. words) slightly difficult for him/her level. In this way, it is our opinion that the learner will expand his/her word box thanks to the new words obtained.

Measuring the student's lexical knowledge

If it was a speed track then it could be measured by calculating the average speed of some sprints made, but since the case here is about whether he / she gets the answer right or not. It is believed that another calculating method or approach should be adopted in this case, since estimating the student's lexical knowledge and bringing him/her a course material or a test that is tuned to correspond to his/her lexical competency is one of the ideas the am-learning project aims to implement in order to fulfil the individualization concept in the text modulation and testing field.

So, giving a student a kind of rating according to his performance in previous tests raises the need of relating him to a numerical representation of his current verbal competency state (lexical competency) which can be described also as the probability of the student to choose the right answer.

When talking about probability the Gaussian curve makes sense to be used as it intends to cover all the possible outcomes of a test in a bell shaped curve that differs in density from one point to another assuming that the outcome will expectedly be some value in the middle of the curve (average) and calculate other outcomes as gradually less likely "errors" as they are exponentially travelling away from the centre of the curve.

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Going through some common rating systems that are used such as Elo statistical rating system (Elo, 1978) and Microsoft's Bayesian rating system (*trueskill* – http://research.microsoft.com/apps/pubs/default.aspx?id=67956) provides a profound and solid starting point towards relating the student's lexical competency with a numerical representation, where in simple words it should match the student's lexical "rating" and provides him/her with a test or a modulated material that corresponds to his/her "rating" in order to maximize the outcome of his/her learning experience and accelerate his/her learning pace and outcome.

Adopting the theory model, Orbis Dictus platform is an already working web-based distance educational platform that represents an advanced way to deliver automatically adapted e-learning materials and tests based on lexical statistical computation. Three distinct technological tools form this innovative platform, each of them implementing different functions:

- LexMeter module: outlines an initial profile estimating the learner's characteristics depending on his/her lexical competency.
- ProgressMeter module: creates small tests to monitor the learner's gradual improvement through the learning path.
- Adapter module: using the results obtained by other two; this tool automatically adjusts the course contents (message).

In order to obtain an outline of the potential learner in a distance course, LexMeter automatically creates cloze tests specifically focused on a fixed topic using texts archive. By computing words occurrences in the archive, it creates the test (omitting automatically a specified number of words) following the already mentioned first hypothesis: the lower the word frequency is, the harder it is for the students to answer.

ProgressMeter acts as LexMeter on a more detailed scale, monitoring gradual and dynamic changes of learner's results throughout small filling-the-blanks tests placed after each reading material.

Using the results obtained by LexMeter and ProgressMeter, the Adapter module automatically adjusts the educational message in accordance to a second hypothesis: *increasing details in explaining low-frequency words helps students understanding the text*.

The message modulation is obtained introducing a brief explanation right inside the text, in order to help the student completely understand the words contained in the text. This algorithm is used only for words with a frequency that is considered low (hard) for that student profile. Thanks to this process, the learner could easily use the adapted material (e.g. reading the text and understanding more).

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Estimation

To compute this lexicon and its frequency, LexMeter uses a database of texts related to the course subject and computes its lexicon discarding all the *ineligible terms* (eg. too short words, words located in the first sentence of the text) and all the words contained in the *List of Common Words*. LCW is modifiable by the final user, and it contains all the so-called *form words* and a selection of words that are defined flat by the user. A term not contained in this list is considered as eligible.

To initialize the process of cloze creation, the user chooses the text used as the basis of the cloze test (hereinafter called original text) and he/she selects a valid range of frequency, in other words the rank bracket of the lexicon. Assuming the hypothesis stated before, i.e. the lower the word frequency of the words, the higher the difficulty of the cloze test we identify the lower difficulty on the left side of the frequency bar, the higher difficulty on the right side of it (Figure 1).

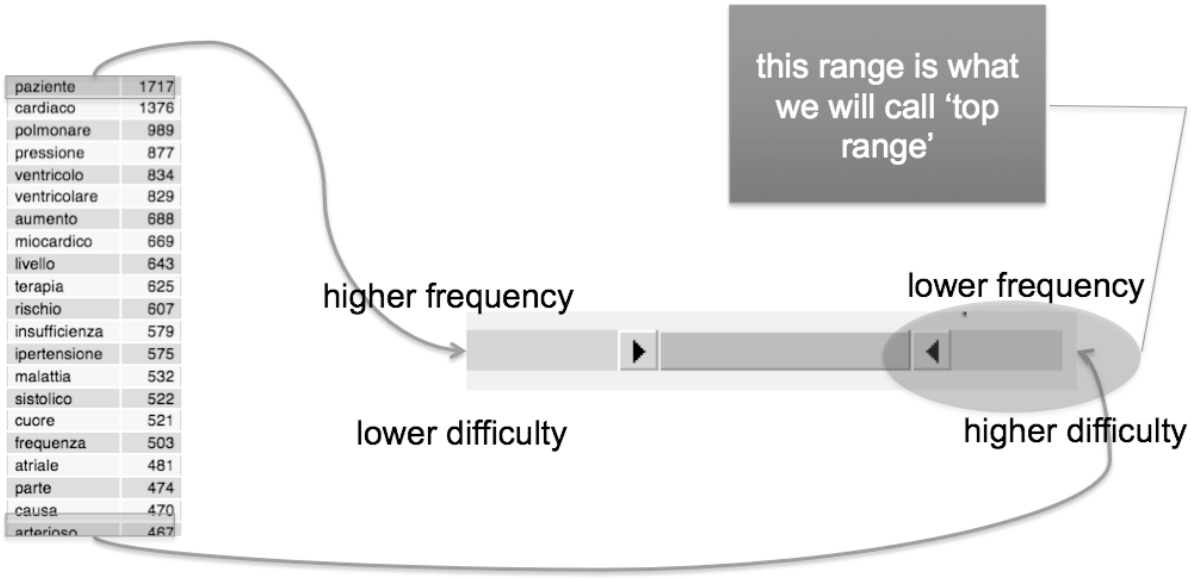

Figure 1. The frequency bar and the top range

LexMeter compares any eligible word of the original text with those included in the lexicon frequency and searches for correspondences. When a correspondence is found and its frequency is in the selected range (that is to say when the rank is in the selected rank bracket), the word is extracted from the text and put into the Solutions List (SL).

At the end, the application creates an exercise showing the resulting modified text. Hence the user can add title, introduction and change the solution list and the test box accordingly to his/her needs. The test could be exported in PDF format or in a more advanced format (IMS QTI – http://www.imsglobal.org/question/qtiv1p2/imsqti_oviewv1p2.html) in order to use it in different Learning Management Systems.

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Monitoring

The idea of the ProgressMeter has emerged from the need for an intermediate measurement tool that helps observe the learner's gradual improvement through the learning process/path. This approach offers a more detailed and precise estimation of the learner's current level that will guarantee a better-modulated teaching content.

In addition to complementing the work done by the LexMeter and the Adapter modules, and offering the possibility to monitor the gradual and dynamic change of the modulation value, ProgressMeter's main trend is to create small tests, where the teacher has the possibility to choose the main factors (5 out of 10) that will define the final outcome of the progress test offering a human touch towards the perfection of the whole automated procedure and minimizing the error margin caused by machine automation.

The process of creating a progress test starts from choosing a proper name and an introduction that fits the test to choosing the desired adaptive document (and implicitly its relevant glossary file) from which the ProgressMeter fetches the candidate phrases list. Furthermore, the teacher can choose the phrases, and then the system proceeds into creating the test with the previously selected phrases and inserting it into the tests' database from which he/she can connect it into a chosen learning path.

But how does the system choose the candidate phrases? The ProgressMeter divides the whole text into small fragments accounting the dot "." as the end of the phrase indicator allowing it to define the start and the end of each phrase, thenceforth it starts a string search in furtherance of finding matches for the glossary words in the selected phrase. Whenever a match is occurred, the phrase will be added to the candidates list otherwise it will be discarded proceeding to the next phrase, this allows the system to get the most candidate phrases possible out of the adaptive document.

Taking into consideration while processing the adaptive document in search of candidate phrases, only one occurrence could take part in this process which leads to a maximum of one blank to fill in every phrase, this blank is presented in the phrase as a highlighted word. As the level of difficulty option is present at the beginning of the test creation process, it limits the number of phrases that can be selected as candidates and the possibility to fetch a satisfactory number of candidate phrases.

This is where another approach takes place with an algorithm that enlarges the difficulty interval by 1 % from both sides each time the system does not reach a satisfactory number of phrases. In other words as an assumption of selecting a medium difficulty progress test this limits the range of frequencies of the within-range words from 33 % to 66 %, whenever it gets a number of candidate phrases less than the satisfactory (10 for example) it enlarges the range by 1 % which results into a new range of 32 % to 67 % that gives the system a more convenient range in order to reach the satisfactory number (Figure 2).

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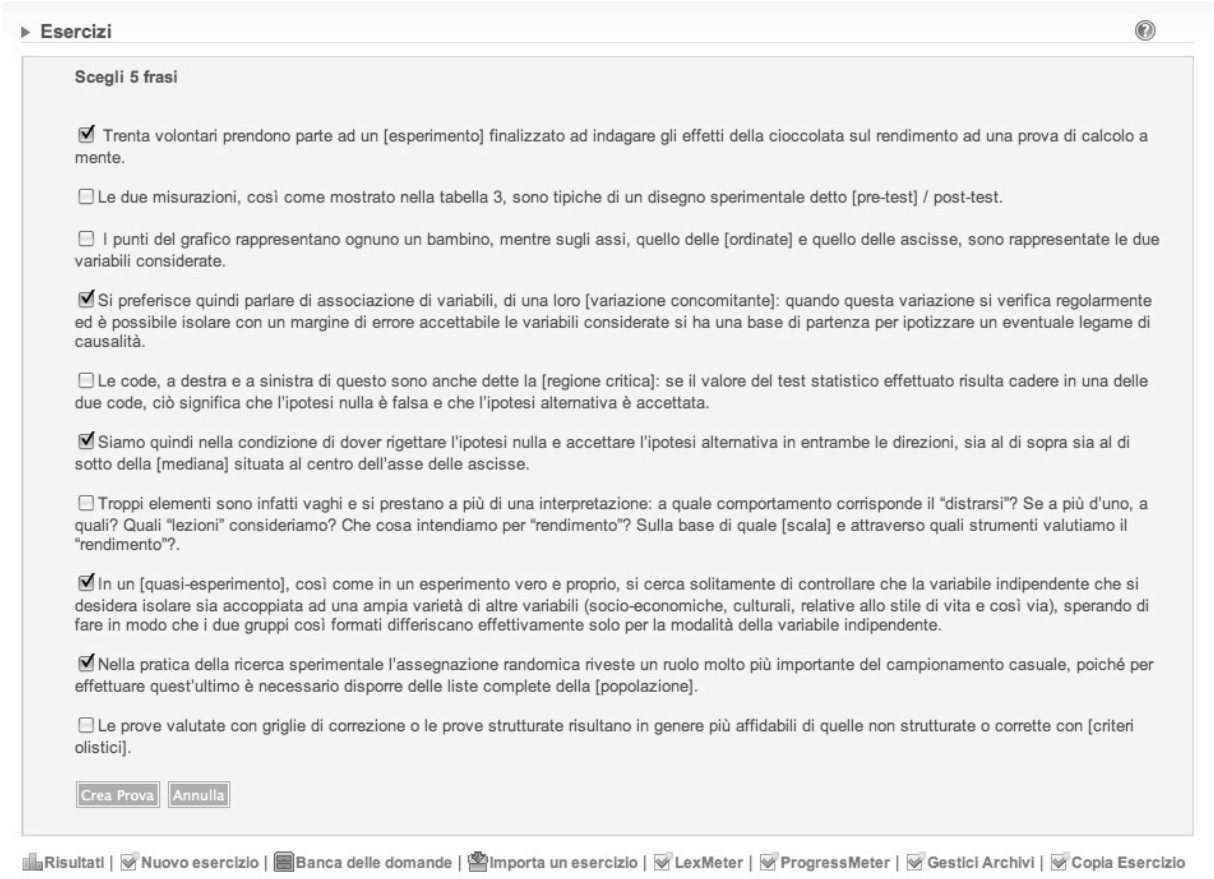

Figure 2. ProgressMeter candidate phrases window

Going through the whole operation from creating the test to inserting it into the chosen learning path, once the student takes the test, the adapter module takes into consideration the result and compares it with his/her previous performance to reach a more precise estimation of his/her current level. This will decide the chosen difficulty of the words to be modulated (accompanied with proper explanations) for the following adaptive document in the learning path.

The formalized hypothesis arises from this phase is: *the more progress tests are present in the learning path, the more precise the system's level estimation is*. At the time this article is being written, an experimental course is taking place in order to validate the hypothesis. The dynamic process of progressive testing aims to aid learning systems to define a more individualised and unique route for each student depending on his/her initial and gradual progress.

Modulation

Modulation process started from the second hypothesis: *increasing details in explaining lower frequency words helps students in understanding the text*. To achieve this goal an automated modulator of didactic materials and texts has been developed (the Adaptor tool) which uses the real student's profile, In other words, the lexicon of these texts has to match up with the words contained in the real student word box. The software will achieve this result through an

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automated modulation of words within the high lexical frequency range (the top range). Adapter is the first designed model of an automated solution to modulate texts. As for LexMeter, this tool is based purely on statistical computation. It creates the list of lemmas ordered by frequencies contained in the text and it integrates all the words within the top range with automated sub-phrases in order to increase the comprehension of the text. This process will be possible thanks to a glossary file, filled on purpose, so Adapter will attempt to find the *difficult word* in this database and it inserts the integration right after the first occurrence of the same word.

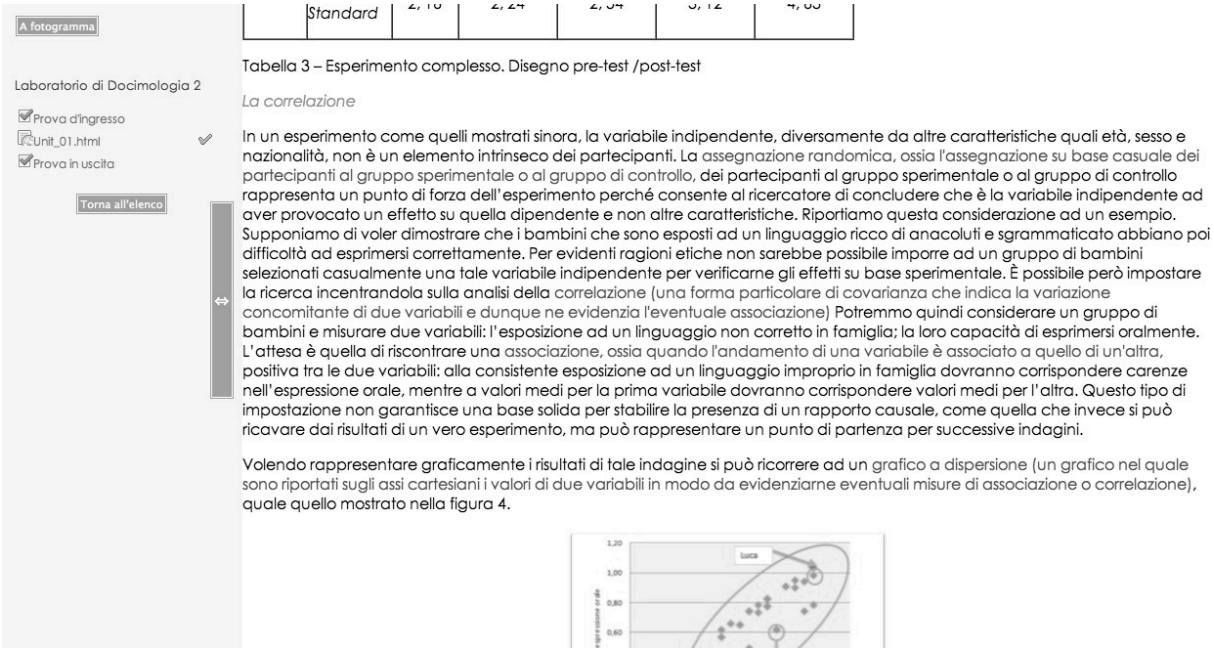

Figure 3. A modulated text by Adapter

Conclusions

In this contribution we presented an innovative new approach to the automated creation of the tests and subsequent modulation of didactic materials. The innovative method used to adapt the educational message and not the entire content leads to a new adaptation level considering that the modulation is a new factor that has never been highlighted in previous individualization approaches.

In addition, the Orbis Dictus educational platform, that integrates LexMeter, ProgressMeter and Adapter tools, is used in the am-learning project in order to evaluate the lexical skill of the University of Rome students "La Sapienza", the University of Modena-Reggio Emilia and the University of Rome "Roma Tre". The use of the platform during normal teaching activities for undergraduate students allowed teachers to track learners' progress during the course and have them conscious of their improvements.

The two different outcomes of am-learning project, the Orbis Dictus model and its implementation, represent the starting phase in developing not only a comprehensive educational theory but also an empirical experience of a new e-learning system.

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THE ROLE OF LEARNERS AS VALUE CO-CREATORS IN E-LEARNING

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Introduction

The development process of distance education courses as well as eLearning courses has been conventionally seen as a tightly structured value chain from needs analysis through evaluation and continuous improvement. This development process has replicated and imitated the production processes and value creation processes of industrial goods.

However, the value creation in modern eLearning environments is mainly based on active communication between different actors. Thus value is not created mainly through a well-designed production process, but rather through active co-creation between teachers, tutors, learners and the larger society. Also the understanding of value should be viewed from a new perspective – value should not be measured only as direct learning outcomes, but also as participation and involvement of the learners, co-learners, teachers, and supporters.

Learning in changes

The value creation metaphors are changing, and so are also the learning metaphors. The changes in learning can be described in various ways, but the elementary changes can be summarized in the following five key trends (Ehlers, 2009):

- from reception of learning content to active participation of learners;
- from inspecting the learning outcomes to active reflection;
- from planning education and training for the learners to planning education and training by the learners;
- from "push" of learning content towards "pull" of learning content;
- from individual intelligence domains to collective intelligence domains.

The key trend is the role of active participation by the learners to their learning process in every stage. The modern online environment also enables the learners to utilize available resources and visualize their competence e.g. by ePortfolios and collaborative project work.

The key enabler – even driver – for the changes has been the development on Internet – and, in particular, the emergence of the "Web 2.0". The content creation in Internet is dominated by ordinary users, and this trend applies also to eLearning. Many scholars, such as Yochai

Benkler, claim that ordinary users are entering the nucleus of digital content production in the Internet (Benkler, 2006). The user-centred peer production mechanism has been essential in creating and developing many of the key innovations of the Internet age – e.g. in the development of Linux software and the Wikipedia movement (Tapscott & Williams, 2006).

Contemporary authors, such as James Surowiecki and Charles Leadbeater, have shown that "many are wiser than few" and that the knowledge creation and knowledge assessment processes in the Wikipedia age are different than former knowledge creation and assessment processes (Surowiecki, 2005; Leadbeater, 2008). An elementary part of communication and problem solving is taking place in the online world using the mechanisms of "crowdsourcing" and thus the "wisdom of the crowds".

Value chains and eLearning

The delivery of effective learning is often visualised based on the value chain approach introduced originally by Michael Porter in the 1980s (Porter, 1985). Based on the Porterian thinking, the goal of the learning provider is to streamline the actual course production process by using the well-tuned consecutive steps of needs analysis, course design, course delivery, course interaction, and assessment. Often also the planning and implementation of distance education and eLearning has been described with a similar logic and structure (Moore & Kearsley 1996).

The value, in this Porterian view, is understood to stem from efficient eLearning course provision and effective facilitation of interaction between the learners and the teachers as well as interaction between the learners (see Figure 1).

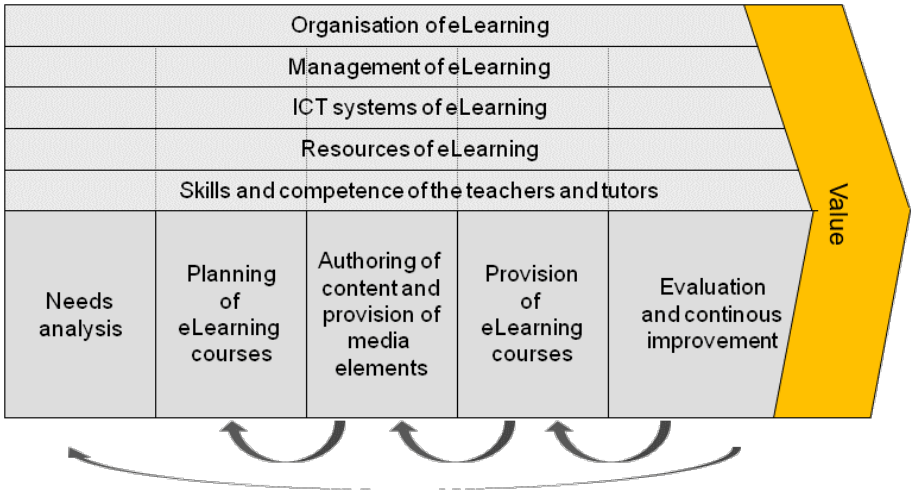

Figure 1. Porterian view of eLearning value creation (applied from Porter 1985)

The structured value chain approach has, however, offered many clear benefits in providing clear consecutive phases of work, and systematic method in planning and implementing eLearning. However, the Porterian thinking in eLearning belonged to a time when the learning environments were closed and the teachers and tutors were providing – even dictating – all the critical learning resources.

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Towards understanding Service-Dominant Logic

However, the Porterian view has been challenged during recent years by alternative views. The fresh discourse of service-dominant logic challenges the conventional thinking of value creation. The main argument Vargo and Lusch were proposing in 2004 was that services behave differently from goods (and thus "goods-dominant logic") and thus the mechanisms in producing and consuming services do not follow the mechanisms of physical goods (which Porter's value chain mainly describes) (Vargo & Lusch, 2004). Thus also the value creation happens differently – not by the effective production and provision mechanism only, but rather by the value creation within the interface of the producers and customers.

The value co-creation has been emphasized in particular by Prahalad and Ramaswamy (Prahalad & Ramaswamy, 2004). Their main argument is that the market is becoming a forum for conversation and interactions, and that the management and facilitation of this dialogue is the key in value creation process. Their view of the market means that the market is becoming instead of a seller-buyer-market rather the environment for co-creation of value. Furthermore, they define that the key building blocks for the interaction between users and providers of services can be defined as dialogue, access to important information and resources, risk-benefit assessment by the users, and transparency of work and working methods. It is elementary that the dialogue focuses on issues that interest both the users and the providers; that there is a forum in which the dialogue can occur; and that there are clear rules of engagement that make for an orderly, productive interaction (Prahalad & Ramaswamy, 2004).

Prahalad and Krishnan develop this idea further in claiming that the co-creation of value can also occur on the global level, and that the co-created experiences can be even more personalized (Prahalad & Krisnan, 2008).

In eLearning we can easily understand that our courses and learning environments provide such fora, where not only the users and the providers can meet, but also the users can meet with another. The importance of peers in modern contemporary learning is growing – not only due to the growth of user-generated content, but also due to the importance of various peer networks. Vital examples of peer networks, which can also be of great importance for learning, are communities of practice (Wenger, 1999).

Based on the ideas of value co-creation, the eLearning environment can be described as an arena and forum for joint, shared value co-creation (see Figure 2).

Figure 2. eLearning course environment in value co-creation

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How can we support value co-creation?

The contemporary examples of new value creation approach by value co-creation have been convincing. Excellent examples are, for instance, the Linux operating system and Wikipedia encyclopaedia. In training, many progressive companies have utilized the power of the co-workers and facilitated the knowledge creation and assessment process.

According to the modern view of eLearning, value is not created by effective provision and planning, but rather through a continuous dialogue with the learners. Other learners – co-learners – are becoming important actors in the value creation process. The role of the teachers and tutors is changing and becoming more challenging, as they become a part of on-going and ever evolving dialogues.

In practical terms, four approaches can be suggested in accelerating value co-creation by the learners in eLearning. Firstly, the expertise and interest of the learners must be understood, recognized and supported. Thus the learners must really be understood as "subjects, not objects" in their learning work. The learners should also be encouraged to share their knowledge, learning experiences and ideas with other learners. It should also be noted that encouraging rich user profiles enables users to describe themselves. Research results of online communities show that knowing more about the other users increases also users' willingness to actively participate in online communities and in general accelerate the communication within an online community (Chiu-Hsu & Wang, 2006).

Secondly, the creation and communication of creative work should be recognized and rewarded. Thus instead of only recognizing compliance with learning objectives, the recognition and rewarding should include also active collaboration and contribution. Also the rewards in co-creation environments are different – the active contributors can also gain social capital, which can be an important motivator (Wasko & Faraj, 2005; Zheng, Zhao & Stylianou, 2010).

Thirdly, teachers, tutors and other actors should be introduced to this new value co-creation environment and also trained to utilize its full potential. In particular, this means that the roles are changing, but also the time allocated and used is in change. As the role of the teachers and tutors is altering, it should be recognized that their key role in the future is moderation. From the research of online communities we have learned that good moderation is generally desirable to improve information quality; some authors claim also that frequency of moderation is critical (Chen, Xu & Whinston, 2011).

And fourthly, clear and unambiguous guidelines should be provided for all actors. Important areas to cover are, among others, immaterial property rights (IPR) and scheduling of work. Value co-creation does not just "happen", it must be planned and implemented properly.

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Conclusions

We are moving in eLearning from closed learning environments towards open learning environments. Our learners are able to identify, assess and utilize good learning resources and content from the wide provision of the Internet. Simultaneously the role of the teachers, tutors and supporters is also changing, and their new key role is the facilitation of learning, knowledge creation, assessment and sharing.

At the heart of the new strategies for in eLearning is the understanding of value creation: is value created by a well-planned and well-controlled educational provision or is value created with the users in continuous communication.

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WHO IS THE JOY OF LEARNING IMPORTANT FOR?

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Abstract

The joy factor of learning came into the focus of educationalists due to the progressive educational movement and then the concept of Lifelong Learning highlighted the importance of attracting and retaining adults in education. However, it is not treated alike by the different stakeholders. As the results of the survey of BME suggest learners see the joy of learning through different lenses depending on a number of traits and learning related conditions. While the survey also suggest that digital learning environments tend to be more suitable for joyful learning our students still find the joyful elements of mainstream learning environments. These findings point to an increasing utilization of the 'good' parameters of both the 'old' and the 'new' learning environments. To make joy more embedded in different learning environments still much has to be done by the stakeholders in their relevant fields.

> *"Even without success, creative persons find joy in a job well done. Learning for its own sake is rewarding." (Csikszentmihalyi, 1996).*

Introduction

For centuries learning was not associated with joy or fun. In the Middle Ages learning was supposed to occur in serious and quiet environments, and accordingly was teaching organized. Learning was seen as a laborious activity limited for a short period of life. This approach was first changed by the reform or progressive educationalists (Rousseau, Pestalozzi). Then, in knowledge-based societies, when learning is no longer a phase of life but a continuum, the joy factor of learning has come much more into the front (Bloom, Skinner). Learning is no longer supposed to occur in environments solely confined for educational purposes, or a short period of time. It has become (more) important to create an atmosphere in which learning is a meaningful and intrinsically motivated activity as a consequence of the approach that learning must be valued for its own sake. The changes in the importance of learning are well reflected in the growing number of dominant learning theories showing the diversity of the learning experience.

The joy of learning

Learning can be seen as a process or as a product. Consequently, joy – or the state of happiness or felicity[1] – can either be connected to the process of learning or to the results of learning. It is not a concomitant of learning; it is normally not something that can be taken for granted. Learning is a kind of change, but changes are not always welcome. We are often hesitant, unwilling to change, resist changes for different reasons. Thus, learning is more often than not associated with negative feelings and not positive ones. Our conceptions of learning are individualized, so are our perceptions of learning. It is a serious challenge for educationalists how to create learning environments providing positive feelings. The positive feelings are more and more associated with an increased motivation, which is a must in the case of time-consuming and learning intensive subjects such as foreign languages or when we engage in learning at the expense of work or family commitments or in our free time. Anyhow the process of learning is paved with highs and lows, that is, joy can be associated with short periods of the process, much more with micro learning, or with the outcome.

The joy of learning in the focus of our research

To find out more about the joy of learning our research team used different approaches. During the desk top research phase, the issue of the joy of learning was in the focus as seen by educationalists and learners reflected in papers and learner blogs. By studying Hungarian, English and German blogs to find out more about learners' learning related subjective feelings and self-reflections, it was possible to get an international insight. This non-formal research method has led to much valuable information. The interpretation of learning related joy varies a great deal. The experiences can be classified into two marked categories (among others). Joy is either related to well-defined obvious goals (e.g. the bloggers of a German blog say that learning is pointless unless it is related to concrete labour market promotion goals). The other group sees the joy of learning as related to success as opposed to goals, when after learning you have the feeling: 'I did it!' However, it must be noted that this kind of success is only hailed when the tasks involved are sufficiently difficult to really challenge the learners. Generally, it is that challenge or the tasks of "just manageable difficulty" that carry us away along the learning process and become the dominant factor of the learning experience.

According to bloggers learning related joy is either experienced in early childhood or in old age. In the former case curricula and educationalists aim to create learning environments and activities abundant in joy. In the latter case learning for its own sake is seen rewarding and joyful. This is the age group who are engaged in learning without any external constraints.

Numerous blogs deal with the fact how learning or the learning environment could be made endurable or even joyful to attract potential "consumers" of various courses, to make learning (and courses) marketable.

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In the second phase – in February 2013 – two target groups were surveyed: a batch of university students (15 undergraduate students of the Department of Technical Education, BME) or respectively the participants of an adult education course (15 teachers, students of a teacher further training course of the Department of Technical Education, BME) were interviewed and asked to describe learning environments, activities or situations which they associated with joy. All the respondents' learning experiences are related to main stream or blended learning environments. Their answers were classified into categories and compared with the ten factors of flow defined by Mihály Csikszentmihályi. This part of the research has resulted in the findings summarized in Table 1 below. Although, this cannot be considered as a large scale survey, it has added new colours to the picture.

People cannot easily recognize when they are feeling joy. It is primarily associated with personality traits (M. Csikszentmihályi) and in learning depends on numerous factors such as motivation level, age (generational differences), metacognitive competencies of learners, self-regulation and self-reflection in learning, and the learning environment as well.

When analyzing the interviews, Csikszentmihályi's ten factors experienced with flow were used to classify the responses. Csikszentmihályi's factors were already used in other researches which also studied the joy factor of learning (e.g. Kádár-Somodi), so our approach is not novel. However, our interviewees' answers are less obviously related to Csikszentmihályi's factors. It was not our goal to test the flow experience in our research, but his factors were used as a starting point for the analysis of the results.

In Table 1 Csikszentmihályi's factors are numbered from 1 to 10, the ones marked from i to vi are the ones that came up in the answers and are not related to the flow experience. It is also shown in the table in what degree the factors are present in digital learning environments.

The results show that 'Absorbed and focused only on activity', 'Motivating methods', and 'Access to information', are the factors that were found important by our respondents and are also characteristic of digital learning environments. In the case of the other factors no such correspondence occurred. At the same time 'Balance between ability level and challenge (problem solving)', 'Intrinsically rewarding activity', and 'Interesting' are such factors that were important for our respondents but cannot always taken for granted in digital learning environments. This result is congruent with the results of our former research results (Baloghné, Benedek, Vidékiné Reményi, 2011) which that blended learning environments are hailed by our students.

This time when we wanted to find out how the digital learning environment affects the joy factor of learning, whether it leads to a greater joy or a different kind of joy in comparison with the mainstream university learning environment, it was obvious again that our students do not reject mainstream learning environments altogether, but prefer a mixture of the old and the new.

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Table 1: Survey results compared with Csikszentmihályi's flow factors

	Barely relevant / relevant / highly relevant in our survey findings	**Digital learning environment**
1. Clear goals and expectations	Relevant	Not characteristic
2. Deep concentration	Barely relevant	Not characteristic
3. A loss of the feeling of self-consciousness		Not characteristic
4. Distorted sense of time	Barely relevant	Highly relevant
5. Direct and immediate feedback	Barely relevant	Highly relevant
6. Balance between ability level and challenge (problem solving)	Highly relevant	Possible
7. A sense of personal control over the situation or activity		Highly relevant
8. Intrinsically rewarding activity	Highly relevant	Possible
9. A lack of awareness of bodily needs		Possible
10. Absorbed and focused only on activity	Highly relevant	Highly relevant
i. Lack of negative emotions	Relevant	Highly relevant except for in the case of limited IT literacy
ii. Motivating methods	Highly relevant	Highly relevant
iii. Cooperation	Relevant	Highly relevant
iv. Interesting	Highly relevant	Possible
v. Communication, networking	Relevant	Highly relevant
vi. Access to information	Highly relevant	Highly relevant

As it is also evident from Table 1, the results of the survey have confirmed our prior supposition that the digital learning environment more often than not can lead to the experience of joy, as the criteria of joyful learning are embedded in digital learning environments in a greater rate than in mainstream environments.

However, our teaching experience of several decades suggests that joy does not come natural; it needs to be worked for by learners, teachers and course developers alike. That is why in the third phase of the research course evaluation was in our focus.

In this phase course evaluation sheets of numerous Hungarian and international courses were studied and analyzed to find out how important the joy of learning is for those engaged in course design and quality management. The result of this phase of the research is rather distressing. No course evaluation sheet asking about the joy factor of learning even in the widest sense has been found. This fact suggests that the joy of learning is not essential for the stakeholders alike, in spite of the fact that lately, the role of motivation, especially enhancing and nurturing learners' intrinsic motivation, is considered essential.

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Who the joy of learning is not important for

Empirical experience suggests that joy is not structured into course curricula except for the lowest grades of primary schooling. Primary school teachers do their best to make learning in the first few grades as joyful as possible. This approach is thinning with the age of the learners and finally almost totally disappears. General education teachers and curriculum designers rather focus on the content of education. The situation is the same in tertiary education. Joy is not considered to be important either by teachers, or learners. In spite of the fact that course evaluation has become general in tertiary and adult education, quality management does not cover this factor.

Who the joy of learning is important for

The joy of learning appears as a call word on the homepages of educational providers who are using it as a marketing strategy to attract potential learners. Adults are lured back to school with the promise of pleasure or reward or dozens of learning tips highlighting fun. Joy becomes an important factor in adult education after demanding years of studies. No doubt it is not easy to make adults believe that learning can be joyful with harrowing educational experiences to remember. However, as our survey findings show learning related joy is not uncommon. But it needs to be worked for by learners and teachers alike.

Conclusions

Joy is obviously a basic activity of human life. Human activities as such are ab ovo related to joy. So, in spite of its laborious character, learning can be a source of joy. We are not saying that joy is a concomitant of learning, or it should be. However, it could be the added value of schooling. By changing learners' perceptions, motivation for further learning can be maintained. However it needs overall efforts of all stakeholders.

The 'I did it.' kind of success has been found an important factor of joy. The mainstream, over-regulated, linear learning environment is not suitable for ensuring this kind of success. Self-regulated learning can only provide this experience, which can only be realized in digital learning environments by means of tailor-made modes of learning. Self-regulated learning presupposes active, constructive learners who regulate the learning process by defining their own goals, reflect on their cognitive activities, motivation and learning behaviour. Self-regulated learning is not yet part of our mainstream learning cultures. In order to make it more mainstream the metacognitive competencies need to be developed and digital learning environments need to be more fully utilized. Self-regulated learning 'increasingly can be contextualised within social learning environments', and is seen to be 'often achieved by students outside the formal surroundings of school or university, with no time or location constraints'. (Wheeler, S.). The encouragement of atypical learning relying on personal technologies can be considered a way to more joyful learning. Here the collaboration of the 'old' and the 'new' world of education is needed; mainstream and personal technology based

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learning should not exclude each other. Formal education should encourage the development of the skills that are essential for atypical learning to promote the move towards joyful learning.

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[1] The definition of joy by the Free Merriam-Webster Dictionary

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DESIGNING AN E-TUTORING SYSTEM FOR LARGE CLASSES: A MIXED-METHOD RESEARCH

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Abstract

This study aimed at assessing the perceptions of 167 teachers about the tutoring system adopted in an online training course involving teachers from 20 Schools of Sesimbra, Setúbal and Palmela counties. The course, called "Distributed Knowledge with Web 2.0", was officially certified as a blended learning modality, with the duration of 50 hours, 41 of which occurred online in two editions, the first in February and the second in July of 2012, each one of them involving respectively 82 and 85 teachers, divided in four classes with about 20 trainees each. This blended learning course was designed at producing educational materials in digital format, and included autonomous and group activities, knowledge sharing and reflection. A learning environment, supported by the Ning platform, was set up. At the end of the course, the trainees answered to a pencil and paper survey, in order to evaluate the adopted online tutoring strategy. Additionally the trainees' final reports contained evidence of how the trainees assessed the tutoring model component of the course; both the survey and the reports were the basis for this research. The results show that the teachers who attended the two course editions disclosed very positive perceptions about online learning, a modality they consider adequate to their current professional status and conditions. The trainees also showed their intention of, in the future, opting for blended training arrangements. Future developments of this study involve a content analysis of the tutor's posts, in order to understand more accurately the tutor's messages characteristics, in their social and cognitive dimensions.

Introduction

With the expansion of communication technologies, of learning management systems and dialogue tools, it has been possible to create opportunities for dialogue in online learning courses, to provide for more interaction between tutors and students and online tutoring has proved to be an important aspect in a direct influence on the course delivery.

The identification, description and categorization of the tutor's tasks has been studied by researchers such as Anderson, Rourke, Garrison and Archer, (2001), Berge (1995), Mason (1997), Paulsen (1995), and Salmon (2000). All of them are highly influential on the research on e-tutoring to the present days.

Berge (1995) refers to four fundamental mentoring functions of 1) management, 2) socialization, 3) technological and 4) pedagogical.

Paulsen (1995) and Mason (1997) both use the same taxonomy and identify three main tutor's roles: the organizational, the social and the intellectual. In the organizational context, Paulsen includes the functions of establishing objectives, setting rhythms, mentoring, facilitation, mediation; in the social component, Paulsen identifies the tasks of being a host and a facilitator; the teaching functions include discrimination, explanation, tutoring, mediation and challenge, the last one being very similar to the Socratic questioning, all are categorized in the intellectual role (Paulsen, 1995).

Salmon (2000) suggests a both-sided mentoring model that includes two main areas: technology and tutoring; in her model, the tutor's tasks, functions and level of assistance change as the learning progresses, through five stages, the tutor's support at each stage being essential for the transition to the next stage and will vary in quality and quantity, throughout the process.

Therefore, the e-tutor's essential tasks are well determined in the literature. Tutors are expected to support the students with technological issues, to organize and lead the students' learning, to moderate discussions, to encourage participation, to solve communication issues, to lead either individual or collaborative knowledge building, critical thinking, problem solving processes, to answer to the students' questions and to correct trajectories.

This study aimed at assessing the perceptions of 167 teachers about the tutoring system of an online training course involving teachers from 20 Schools. The course, called "Distributed Knowledge with Web 2.0", was officially certified and occurred in a Teachers Training Centre in the South of the country. This blended learning course was designed at producing educational materials in digital format, and included collaborative information sharing, reflection and knowledge building for professional development. A learning environment supported by Ning platform was set up. At the end of the course, the trainees answered to a pencil and paper survey and wrote their final reports, which were the basis for this research.

The number of trainees involved and the planning of an effective mentoring system was one of the major issues that had to be dealt with, due to the number of trainees involved. Thus, the success of the course became highly dependent on the tutor's organizational skills, which where key issues to perform the designed pedagogical model, being the tutor's support one of the main evaluation issues.

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Literature review

The tutor' support and supervision of group work and collaboration among students is an axis of research in distance learning (Kirshner, Sweller & Clark, 2006; Kopp, Germ & Mandl, 2010), in order to determine the nature of the tutor's tasks and how to provide an adequate support to participation, interaction, knowledge construction and critical thinking. This area has been identified as a critical area of research (Berge & Mrozowski, 2001; Holmberg, 1985; Panda, 1992; Scriven, 1991; Zawacki-Richer, 2009).

Collaborative learning, participation and interaction are critical for the students' motivation and success, since only active participation can trigger interaction and collaboration, which make both students and their tutors visible and present to the community (Anderson, Rourke, Garrison & Archer, 2001; Shea & Bidjerano, 2009; Wilson & Stacey, 2004).

Moreover, research has also shown that many of the issues related to participation, interaction, collaboration and learning relate to an effective mentoring (Harasim, Hiltz & Teles, 1995; Khan, 2005; Salmon, 2000).

The tutor's thorough and timely feedback and responsiveness to the students' doubts and questions can be demanding (Connolly, Jones, & Jones, 2007). Stimulating the learning activities and avoiding dysfunctional collaborative activities is one of the tutor's functions that the students value most (Jorge, 2011). In fact, appropriate feedback leads to better motivation (Miller, 2009) and learning outcomes, which can vary, depending on the type of the feedback provided (van der Kleij, Eggen, Timmers & Veldkamp, 2012).

The tutor's personality and teaching style, the way he or she designs and develops the learning environment, the methods and strategies used to display content, the way of organizing the interaction and collaboration among students, of encouraging and nurturing the students' curiosity and creativity, influences the students' commitment to their both individual and collaborative tasks (Chan, 2002). These findings corroborate the association established by Deci, Vallerand, Pelletier and Ryan (1991) between certain personality traits and the e-tutor's facilitation style.

An effective instructor believes in the advantages of autonomy and interaction, is ready to accept new ideas, values and opinions**,** encourages different perspectives, keeps the community's cohesiveness, seeks convergence of views, identifies what triggers reflection, inspires and motivates the students (Barrows, 1992).

Hiltz and Turoff (1985) also refer to the effectiveness of tutors who encourage their students to become independent and seek for themselves the information to support opinions and hypotheses, who answer questions, suggest new paths, diagnose misconceptions, provide alternative explanations. These tutors have a theoretical framework based on autonomy, interdependence, interaction and collaboration (Comas-Quinn, de los Arcos & Mardomingo, 2012; Keegan, 1998; Paulsen, 1995).

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Hamza and Nash (1996) established relationships between the personality and effectiveness of the tutor and found that the tutor's style influences the students' performance and the learning environment, making it more or less conducive to creativity and skills development.

Barrows (1992) considered that, in distance education, the strategies that promote interdependence among students, critical thinking and independent learning and benefit from the students' diversity concerning skills and experience are the most appropriate, which was corroborated by Furnborough (2012), who stated that collaborating with others helped the students to acquire a greater sense of their own control.

Students who have teachers with this profile are considered more competent and academically more motivated (Deci et al., 1991), creative (Hamza & Nash, 1996), disclose a deeper understanding of the content (Boggiano, Flint, Shields, Seelbach & Barett, 1993), have lower dropout rates (Tait, 2004), better learning and levels of satisfaction (Swan, Shea, Fredericksen, Pickett, Pelz & Maher, 2000).

The instructor's personality and her/his teaching style are strongly associated, and there is a significant relationship between the instructor's personality and the degree of cohesion among students (Concannon, Flynn, & Campbell, 2005; Gao, 2006; Rodriguez, Sicilia, Sanchez-Alonso, Lezcano & Garcia-Barriocanal, 2011; Testa, 2011).

The literature on the tutor's roles and functions has established various taxonomies (Anderson, Rourke, Garrison & Archer, 2001; Berge, 1995; Mason, 1997; Paulsen, 1995), reflecting different conceptual, theoretical and philosophical perspectives on learning and, in particular, on learning in adulthood. However, it is clear that only with an active intervention by the e-tutor, who designs, organizes, facilitates and teaches, can the collaborative reflection and knowledge develop.

Online tutoring is a major aspect of online education with direct influence on the delivery of distance learning Thus, as Lee and Figueiroa (2012) stated, the instructor plays an important role on the quality of the students' critical thinking and is an important factor in the students' success and resilience (Jorge, 2009; 2011; 2012). Online tutoring requires appropriate skills, competencies and attributes that include good writing skills, specific content knowledge, pedagogical knowledge and technological proficiency, which require experience (Goold, Coldwell & Craig, 2010; Maor, 2008), adequate training (Kopp, Matteucci & Tomasetto, 2012) and continuous staff development (Connolly, Jones & Jones, 2007), in order to establish differences between online and face-to-face tuition (Stickler & Hampel, 2007).

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Research goals

Two main research goals were defined for this research, as follows:

1. Assess the ways of organizing discourse facilitation and interaction the tutor decided upon.
2. Understand the trainees' perceptions about the tutoring system in an online training course for teachers.

Method

Participants

This study aimed at assessing the perceptions of 167 teachers about an online training course involving teachers from 20 Schools of Sesimbra, Setúbal and Palmela municipalities. The training called "Distributed Knowledge with Web 2.0" occurred in two distinct periods in time: February and June of 2012 at the Training Centre Ordem de Santiago, in the South of Portugal. This blended learning course, developed in a Ning platform, was designed at producing educational materials in digital format using Web 2.0 tools, such as Webnode, Voicethread, Blogger and Google docs. The trainees were organized in groups, both of the same and of different disciplines, had to produce educational materials in group and, on a weekly basis, to discuss several topics. Most of these topics were associated with Web 2.0 tools and their educational and collaboration potential, in order to organize communities of practice and teachers' networks, for their professional development.

Only 2.5 % of the participants were younger than 30 years; 25.8 % were between 30-39 years old; 41.5 % between 40-49 years old e 30.2 % were 50 and over. As for gender, 30 % were men and 70 % were women. As for service time, 7.0 % had less than 4 years' service; 3.8 % between 5-7; 20.9 % between 8-14; 34.2 % between 15-22 and 34.2 % had more than 22 years' service. All the trainees had a personal computer and all but one had a private internet connection.

Instruments

Two instruments were used to evaluate the tutor's performance: a survey and the trainees' final reports.

The survey

At the end of the course, the trainees answered to a pencil and paper survey to evaluate the tutors' participation. Section 1 collected:

1. demographical information, covering gender, age and professional experience;
2. digital inclusion, such as computer ownership and internet access, and
3. digital skills, such as experience with Web 2.0 tools, experience with email, experience with online discussion groups and experience with online learning environments,

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measured in a 4 points Likert type scale from 1: no experience; 2: until 3 years' experience; 3: 3 to six years' experience; 4: more of 6 years' experience.

Section 2 meant to assess the tutor's performance and included the following eleven questions organized in answers with an agreement Likert-type scale of four points (from 1, totally disagree to 4, totally agree):

1. The instructor clearly communicated the course objectives.
2. The instructor helped identify and acquire knowledge on each topic.
3. The instructor clearly communicated the timing for completion of learning activities.
4. The instructor helped understand and clarify issues.
5. The instructor helped us with the online discussions.
6. The instructor's actions reinforced the development of a sense of belonging to the community among course participants.
7. The instructor kept the trainees on task.
8. The instructor sustained the trainees' involvement and participation in a productive dialogue.
9. The instructor's feedback was timely.
10. The instructor's feedback was helpful.
11. The instructor encouraged the trainees to explore new concepts.

The trainees' final reports

In their final reports, the trainees had to organize the information according to generally established guidelines, which included feedback about the training courses' mentor. These qualitative data were collected and analysed through a Portuguese content analysis software produced in Aveiro University. This tool allows for the viewing, editing, linking, and organizing documents with non-numeric and unstructured data (Sousa, Costa & Moreira, 2011, p.49).

Results

The alpha reliability was highly accepted and ranged between 0.923 and 0.926, if any item were to be excluded.

The survey results concerning the tutor's performance are presented in Table 1.

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Table 1: The tutor's performance

	Mean	Std. Deviation	N
The instructor communicated clearly the timing for completion of learning activities.	3.9371	.24354	167
The instructor helped identify and acquire knowledge on each topic.	3.8868	.37283	167
The instructor clear communicated the course objectives.	3.9182	.29700	167
The instructor helped in understanding and clarifying issues.	3.8553	.35286	167
The instructor's feedback was helpful.	3.9371	.24354	167
The instructor's feedback was timely.	3.9686	.17507	167
The instructor helped us with the online discussions.	3.8805	.32540	167
The instructor's actions reinforced the development of a sense of belonging to the community among course participants.	3.7925	.43684	167
The instructor helped sustained the trainees' involvement and participation of students in a productive dialogue	3.8742	.35117	167
The instructor kept / the trainees on task.	3.9182	.27487	167
The instructor encouraged the trainees to explore new concepts.	3.8491	.35912	167

The trainees' reports

The course was designed to promote collaboration, discussion and peer tutoring, in order to empower the students and reduce the tutor's intervention, so that the trainees assumed most of the responsibility for their learning.

When exploring the tutorials provided to the trainees to each session and respective Web 2.0 tool being practised, each student could ask her/his peers for clarification and help with the tutorial, for which the "Share your doubts" forum was set up. Only one third of the responses with a mean of three hours' time, considering that most of them were posted in the evening, were the tutor's.

In the main forum, the students had to share their views about the several Web 2.0 tools they had to use, such as their pedagogical potential. There were also several issues in discussion, such as the sustainability of a community of practice of teachers of the same discipline, where the trainees had to observe an example of these communities (http://www.eslprintables.com) and critically analyse the specificity of online communication, based on one presentation provided by the instructor.

Additionally, the trainees had to work in small groups to build up a site with Webnode, which had to include all the Web 2.0 tools used in the course.

This last assignment was designed so that each group should go through five phases:

1. to choose a representative;
2. to name the team's site;
3. the representative had to open the site and invite the other members to join in;

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4. to develop the site collaboratively;
5. to publish the site's address, the project description and its pedagogical assumptions.

The tutor deliberately had the students working and discussing at the various interaction and collaboration spaces and intervened online only when strictly necessary or the students called him for help. Whenever an activity was completed, he provided feedback to each student in particular and to the teams. He also gave general notice of each group accomplishments at the forum.

However, the students' reports convey perceptions of a high level and excellent quality support by the tutor: 167 references regarding the tutor's behaviour were analysed and categorized in the dimensions suggested by Anderson, Rourke, Garrison and Archer's tutoring taxonomy (2001): Design and organization; Facilitating Discourse and Direct Instruction. Table 2 presents some students' excerpts related to the dimensions described above.

Table 2: The tutor's tasks

Tutor's tasks	**Example**
Design and organization	"The instructor used a methodology of individual and group work, which focused on collaborative work, critical thinking, creativity, constant encouragement of the trainees' autonomy and learning processes." (Course 1, Trainee 6)
Facilitating Discourse	"a quite discreet but attentive instructor's intervention giving space to the trainees (…)." (Course 1, trainee 13)
Direct Instruction	"The instructor gave constant and timely feedback. He was always present and provided (…) constant feedback and suggestions which proved all appropriate and meaningful." (Course 2, Trainee 17) "The support was constant and timely. Being attentive without interfering too much, was always available, showing the way ahead, always with a word of encouragement." (Course 2, trainee 12)

Discussion and conclusions

The results show that the 167 teachers who attended the two course editions have positive perceptions about online learning for their professional development; when explicitly asked about the delivery mode, they do not reject the idea of enrolling in future online training courses:

> *In fact, at the beginning, I had no high expectations on the course being held in b-learning mode, but this solution would ultimately be a huge advantage given the workload we face. (Course 1, Class D, Student 20).*

Though other dimensions such as course structure and content have influenced the trainees' positive perceptions about the course, the way the tutor designed the activities, both individual and collaborative and the interaction tutor-students and students-students has been mostly influential in the trainees' satisfaction with the course:

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> *From the trainer there was constant and timely support. Being attentive without interfering too much, he was always available, leading the way forward with a word of encouragement (Course 1, Class C, trainee 12).*

The importance of online interaction both with the tutor and with peers through group work and discussion boards was clearly demonstrated in the trainees' reports:

> *No less important was the interaction between the trainees and the total availability of the trainer to help and answer questions, encouraging us to participate in each session. Our interventions were always valued, and our requests always attended (Course 1, Class A, and trainee 22).*

The tutor's choice of the platform proved to be suitable, since NING is very intuitive and easy to use and this was an essential condition for the development of the proposed activities, even by the technologically less experienced teachers.

> *The platform was very structured and well organized, which allowed for an immediate appropriation of what was needed for each session (Course 2, Class A, trainee 8).*

> *The platform provided by the trainer was very easy and motivating as it allowed us to explore, with time, some of its potential, as for the customization of our website and use of different workspaces. I believe that the platform was very well chosen, since it provided a simple desktop; it was very well organized, with different separate spaces, allowed for tutorials publication, materials produced by the trainer, and disclosure of the products produced by the trainees and for debates. (Course 1, Class A, trainee 20).*

Being one of the inherent characteristics of the e-learning delivery mode, and as largely demonstrated by the cited references, the flexibility in time management, emerges as one of the aspects most valued by the trainees, though most of them have asserted that the course was challenging for its goals, contents and skills to be developed:

> *Having in mind that we are already in the third term, it was not always peaceful to reconcile the training and the work at school. However, the possibility of a more personalized timing facilitated the tasks' completion (…) (Course 2, Class B, trainee 10).*

The quality of feedback and its timing, as well as the support and guidance provided by the tutor were the most valued by the trainees; however, the strong connections established among the community highly contributed to minimize the initial insecurities due to the inexperience in such delivery mode:

> *The forum "Share your doubts" was of great help and worked according to what the trainer's goals; we progressively assumed the role of peer tutors,*

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> *which made us become more active and confident in helping our peers with their doubts and insecurities (…) (Course 2,, Class A, trainee 8).*

The differences between different technologically skilled groups were tested for their influence upon the trainees' satisfaction with the tutoring strategies, resulting in significance levels higher than 0.01, indicating no influence of different technological skills on the assessment of the tutor's performance.

The tutorials designed by the tutor for each of the course modules provided for the necessary "sense of security" even for those unfamiliar with online teaching:

> *As for the available tutorials, their quality and relevance was undoubtedly a great support as well as all the information published at the platform, which clarified any questions that might persist. (Course 2, Class D, trainee 19).*

The introduction of online learning environments in the teachers' professional development may respond to many of the problems that teachers face, such as lack of time, due to recently extended weekly workload and financial constraints.

The training should be learner-centred and significant, meaning that it must have a direct application and influence on the teachers' practices. It should also be designed in a constructivist logic.

The design of training for the teachers professional development "requires imagination" (Sachs, 2009) and its assumptions must include the person who the teacher is (Nóvoa, 1991), in order to motivate the teachers to invest in their professional development.

The design of a training program cannot be overly focused on the technical tools (Daly, Pachler & Pelletier, 2009). Instead, it has to be closely linked to the curriculum and effective classroom practices (Gooler, Kautzer & Knuth, 2000) and educational goals, where the technological tools are meaningfully infused, in order to improve the trainees' motivation to learn, so that the teachers' professional development can be "transformative, in terms of intentions and practices" (Sachs, 2009).

Such experiences induce perceptions of self-development and of positive influence on classroom practices and reflections, which are ultimately based on new experiences.

The issue of the teachers' work visibility in the community (other teachers, school boards and parents) provided by the use of Web 2.0 became evident in the teachers' final reports. This recognition of their work improved their confidence, self-efficacy and sense of fulfilment, which motivated them to continue to use innovative strategies in the classroom, as well as to a new spirit for developing technological knowledge.

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HOW TO KEEP LEARNERS MOTIVATED AND EXCITED IN TECHNOLOGY ENHANCED LEARNING

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Abstract

In the 21st century there have been several reports on students' lack of engagement and academic motivation (Legault et al., 2006) and that motivation is a prime key to academic success (Linnenbrink & Pintrich, 2002). The aim of the article is to describe and discuss how some selected models for motivation of students/adult learners can be applied in contemporary technology enhanced learning. The main approach in this article is the case study strategy where a case study is defined as an empirical inquiry investigating real world contemporary phenomena (Yin, 1989). The case study consists of three embedded units: the Zagreb unit, the Stockholm unit and the Glasgow unit, and three models for motivation explored in each unit. The conclusions based on comparison of the three models' findings are the following. Effective learning for adults or children occurs when they are given opportunities to engage in shaping their own learning through practical experience as part of the learning process. Learners should be able to test their knowledge via interacting in an enquiring way with their learning context and solve real world problems.

Introduction

In the 21st century there have been several reports on students' lack of engagement and academic motivation (Legault et al., 2006) and that motivation is a prime key to academic success (Linnenbrink & Pintrich, 2002).

Computer science students' motivation has found low and drop-out rates high (Guzdial & Soloway, 2002) and recent studies show that novice students not only have problems with theoretical concepts but also that more practical course sections like programming and code construction have identified problems when it comes to engage and motivate students (Eckerdal, 2009) (Wiedenbeck, Labelle & Kain, 2004). Research indicates that distance and online learning presents different settings from the conventional classroom which have to be taken into account to promote learning. In the case of adult learners, whether professionals or not, there can also be other considerations and here constructivist perspectives can provide useful frameworks to inform effective practice (Huang, 2002)

Aim

The aim of this article is to describe and discuss how some selected models for motivation of students/learners can be applied in contemporary technology enhanced learning.

Methodology

The main approach in this study is the case study strategy where a case study is defined as an empirical inquiry investigating real world contemporary phenomena (Yin, 1989). Case studies are strategies where the researchers explore and evaluate processes, programmes or activities in depth using a combination of data collection methods (Creswell, 2009) with the idea that the different sources of evidence together could generate a deeper understanding of the analysed phenomena (Remenyi, 2012). Case study research is more than any other kind of research relying on both primary and secondary data (Remenyi, 2012) and this article is like many other case studies a combination of our own findings and literature studies. The case study consists of three embedded units.

The Zagreb unit

In the Zagreb unit we are exploring the case of a Grundtvig workshop held in Zagreb, in October 2011. Grundtvig is a sub-programme of the European Union (EU) funded "Lifelong Learning Programme", aimed at supporting development of adult education, exchange of learners and educators, i.e. exchange of adults' knowledge across the European countries. The workshop was entitled "Learn in Croatia about Cultural Differences" and it involved 20 learners and trainers from 7 countries: Bulgaria, Croatia, Ireland, Poland, Romania, Turkey and the United Kingdom. They were all gathered in Zagreb and attended the intensive, five-day workshop which overall goal was to raise cultural awareness and expression of its participants by giving them insights into Croatian culture and a pathway of discussions and comparisons with the cultures the workshop's participants originated from. More specific aims were to engage participants in the firsthand experience with Croatian culture, to enable them to discuss in a group of trans-national learners the issues concerning the cultural diversity of Europe, to develop their intercultural communication skills, and to work on finding new solutions for dealing with the European multiculturalism. In this case study the technology enhanced learning consisted of using photography and images as a key tool of training but, importantly as a mechanism to promote learners' active participation: the first day of the workshop, they were given a task to photograph anything they could find different compared to their own country and culture during their stay in Zagreb. The last day of the workshop, a digital exhibition was held, consisting of participants voting to decide which were the best photographs taken by each participant followed by the participants' explanation of the identified cultural differences as represented by the photos. This also informed the group's discussion on this topic.

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The Stockholm unit

The Stockholm unit case consists of two separate parts where the findings finally are compared:

1. A minor literature study on John Keller's *ARCS Model of Motivational Design* (Keller, 2006).
2. An analysis of the university course *An introduction to programming* (ID:INP) a mandatory course for students following the programmes for Interaction design and Market Communication and Information Technology at the Department of Computer and Systems Sciences (DSV), Stockholm University.

In the literature study there has been a focus on the basic components in the **ARCS** acronym **A**ttention, **R**elevance, **C**onfidence and **S**atisfaction and how these factors should be addressed in actual and virtual learning environments. As John Keller (1999) has pointed out, it is one thing to use these ideas to design traditional classroom education, and another to implement the ARCS model in virtual online platforms.

The course analysis is based on document analysis in the DSV course management system Daisy (2013) and discussions with students and teachers at teaching sessions and course seminars. There has also been an analysis of the ID:INP course evaluation questionnaires from 2011 and 2012 which also are done and stored in the Daisy course management system.

The Glasgow unit

In the Glasgow unit we draw upon findings from a research project conduced over the past two years by researchers in the School of Education at the University of Glasgow that examines a new approach to Continuing Professional Development in STEM education for primary teachers. Making use of new technologies and working with an experienced media presenter, the project aimed to provide non-specialist teachers with greater confidence and motivation to teach science topics in the curriculum in a way that would enhance pupils' engagement with and enjoyment of science. The findings directly relate to policy and practice in teacher learning and development, as well as the management of change. Here we have applied a social constructivist theoretical framework to better understand the processes involved in promoting teachers' motivation and engagement with their own professional learning and its impact on their pupils motivation and learning. A key theme in the research was to explore whether teachers acting as enquiring, reflective practitioners, engaging in partnership with the University research team, could acquire and test new knowledge to develop meaningful and relevant CPD that would enhance their and their colleagues' motivation and skills and impact on the learning of their pupils.

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Models for motivation

The Zagreb model

Models for motivation in the Zagreb Grundtvig workshop were developed on the basis of the practice the workshop's organisers have had from the previous workshops organised and attended. Our assumption was that an active participation had to be ensured in order to keep learners motivated and participative. Not only did the courses and the trainers change during the 5-day workshop, but also the learning environment. On the first day the learners were introduced to the plan of activities and basic theories regarding the intercultural competences; they were introduced with an interactive method of learning basic Croatian words/sentences; and they tested Croatian phrases learned in different life-settings in Zagreb. During the second day the learners got an insight into the Croatian socio-economic profile, they learned about Croatian cultural identity and its continuous formation, they participated in the celebration of the Cravat Day on the streets of Zagreb and they had a talk with the President of the Republic of Croatia in his office. The third day the participants learned about Croatian history in-situ: in the Neanderthal Museum in Krapina and the Castle of Trakošćan, both localities in the vicinity of Zagreb, while on the fourth day they learned about Croatian literature and culinary in the Croatian Writers' Club and the restaurant of the Club. The final day of the workshop was dedicated to discussions among participants, exchange of knowledge related to their countries' cultures and to the digital photo-exhibition, mentioned earlier. Participants' evaluation of the workshop was very positive. Some of the evaluation comments are the following.

> *"Having a chance to meet people from Bulgaria and Romania – countries I have never visited before – was very eye-opening. I had heard many opinions regarding those countries and their citizens, and I must say I had not a very good opinion about them. A week spent in the company of Bulgarians and Romanians made me realize that they are "normal" people (hard to describe, but what I'm trying to say is that all the stereotypes I had turned out to be untrue)… We had a lot of chances to discuss various issues. Some of discussions were being moderated by Grundtvig workshop organizers, and some were happening spontaneously, but they were always eye-opening… I had a chance to hear opinions totally different from my own, and some things people said made me realize that I often base my opinions on very fragmentary picture." (participant from Poland).*

> *"I find my experience with the workshop extremely beneficial. I learned a lot not only about Croatia but also about the countries of the participants. In my opinion, Grundtvig workshops should continue to bring people from different countries together, since nothing can be as good as meeting people of different nationalities in person and learning to value and respect other people's ideas, customs, beliefs and religion. Such programmes are an excellent investment in*

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> *educating people and developing multicultural awareness." (participant from Bulgaria).*
>
> *"The week in Zagreb was great to have on CV (along with Ghana and Spanish teaching experiences). It was a tough competition, only 60 places available and over 1200 applicants. The shortlisting was done from CV content. The interview included exploring the Zagreb educational experience. It obviously had serious currency and evaluated very positively in David's favour." (father of a participant from Ireland, who sent an email three months after the workshop ended).*

During the learning visit, but particularly on the final two days, it was clear from participants' feedback that the active learning and experiential methods had been effective. An important factor was seen by participants as the having an opportunity to interact first-hand with aspects of Croatian culture and using this as a basis to reflect and debate as a group on their own cultures and values. This was seen as developing their own intercultural communication skills but also helping to generate suggestions to promote European multiculturalism.

The Stockholm model

At the Department of Computer and System Sciences at Stockholm University the two programmes for Interaction design and Market Communication and Information are the ones where the students have a non-technical background and that pre-knowledge in Mathematics and Computer science is a rare phenomenon. For these reasons a programming course must be developed a bit different and try to motivate students since Programming and Computer science is something that learners meet with mixed emotions.

The ARCS model – Attention, Relevance, Confidence, Satisfaction

- **Attention:** In the initial phase of a course or a series of teaching session it is important to get the students' attention as early as possible. This can be done by *perceptual* or *inquiry arousal* where students can be confronted with interesting examples or problems in the inception phase. To maintain attention the ARCS model recommends *variability* in the delivery of course content.
- **Relevance**: The relevance of the course material can be aligned by *goal orientation* or matching instructional motives with learners motives. Other techniques in the ARCS model are to relate the new knowledge with learners' earlier knowledge or modelling the learning results.
- **Confidence**: If students feel that they can learn what is stated in the learning objectives they will be confident and motivated. The ARCS model recommends a number of different learning experiences that build upon one another. To provide feedback and personal reinforcement can also support learners and make them confident.

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- **Satisfaction**: Students must feel that the learning outcomes have real values and is worth the study effort. The ARCS model says that teachers should try to create an atmosphere of equity by consistent course standards (Kapp, 2012; Keller, 1999; 2006).

ARCS in the introduction to programming course

Experience from previous course development says that programming courses can have a more successful outcome by the use of overloading multi-modal course content, replacing feedback with feedforward, scaffolding course content in virtual learning environments and presenting the course material in an iterative and incremental way for the learners (Mozelius, 2012). In the ID:INP course the ARCS model is implemented as described below:

- **Attention:** The last and most complex programming assignment is demonstrated on the very first lecture even if students cannot understand the involved programming techniques. Attention is maintained by a multi-modal mix of teaching sessions given face-to-face as well as in the Moodle virtual learning platform.
- **Relevance**: Course content is aligned to the learning objectives and learning objectives are aligned to the two programmes' overall curricula. Concepts from earlier courses are reused in programming contexts.
- **Confidence**: Techniques for creating confidence are scaffolding, a rich number of facilitation sessions and fast feedforward in online discussion fora. Students can also participate in programming workshops on Thursdays where they can work and get help with their programming assignments.
- **Satisfaction:** Students have mainly to solve realistic problems in the assignments and the written exam is based on the practical problem solving. Three to four persons work with the correction of the assignments to provide fast and fair grading with useful feedforward in the virtual online platform. Students can also choose if they want to have the feedforward sent to them by email.

The Glasgow model

Young people are naturally inquisitive and their early experiences of science and mathematics education (STEM) can be highly formative for their future interests, inclinations and motivations in these subjects. 'Curriculum for Excellence' in Scotland fully embodies this thinking and philosophy. The major challenge is to implement this philosophy effectively and sustainably in the curriculum across Scotland. Clearly, improving the quality of STEM education at primary school level is one of the key elements in improving the outcomes for STEM education at all levels in Scotland over the next decade. The 2007 Scottish Survey of Achievement (Scottish Government, 2008),TIMMS – Trends in International Maths and Science Study (Mullis, I.V.S et al., 2011) and the National Evaluation of Science CPD by the SCRE Centre at University of Glasgow (Lowden et al., 2011) all highlight the need for primary science support. The ESESS Project addresses the improvement of primary school teachers' confidence, motivation, subject knowledge and pedagogical knowledge in STEM using a highly innovative form of continuing professional development (CPD) (Pill et al, 2001).

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ESESS is a scalable model of teacher development that uses advanced learning theory to combine the use of digital video technologies, the Internet, and action learning into a cooperative CPD approach (Lally & Scafe, 1995). The Project investigates the effectiveness of low cost, supported action learning in key STEM topics as an effective form of CPD for primary teachers distributed nationally in Scotland (involving very little direct 'face-to-face' contact). Teachers use improvements in their own practice, particularly in relation to undertaking practical experiments with pupils, to create shareable short videos (Reynolds & Mason, 2002) that will become a national archive of flexible and accessible materials. The ESESS Project will provide evidence of the model's potential to improve pupils' learning in key STEM topics.

The ESESS project focused on the key research question: "Can supported action learning in STEM be developed, shared and used as an effective form of CPD by primary teachers in Scotland, in order to improve pupils' learning in key topics?" The research adopted a mixed method approach to address this question, working with 30 primary schools. The project team conducted a baseline assessment of participating teachers' knowledge, attitudes, background, confidence and understanding with regard to key STEM concepts being used in the project. Case studies of each school also helped to understand the working context of each teacher participant. Teachers also monitored their pupils' engagement with science topics and improvements in their knowledge of the key topics. Teachers were also active partners in developing the CPD and learning resources and maintained a research diary during the project to document their experience of the project, observations on use of the materials, and perceived impact. This formed part of the teacher's reflective action research learning component (Taitelbaum et al., 2002). Teachers were also encouraged and supported to use simple data collection approaches, such as video and on-line technologies to gather the views of their pupils on the resources and the difference the project has made. Indeed, the project pilot demonstrated the value of creating a 'video CPD archive' of re-usable short videos made by teachers and pupils to demonstrate their best practice, shared using the Internet.

Findings

Zagreb

- Meeting other participants in person can change positively the learners' knowledge and perception of others, and can trigger positive changes in learners' attitudes;
- Openness of learning environment to the learners' own interests can increase the value of learned;
- Interaction among learners participating in the same courses (workshop) increase the effectiveness of their learning and motivate them for further learning;
- Technology assisted interactive learning experience can influence positively the employability capacities of the learners involved.

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Stockholm

- Initial demonstrations of how problems can be solved with techniques taught in the course seems to be a good way to gain learners' attention early;
- Different students have different learning styles and to overload multi-modal course content is to enable different paths through a course syllabi;
- Concrete learning objectives that in some way are related to learners previous knowledge are useful;
- Scaffolding and facilitation sessions can increase learners confidence in traditional education as well as in virtual online environments;
- Applying skills and knowledge in real world situations or simulations is a better idea than to just go for education for education's sake;
- Communication, discussion and interaction will increase the students' motivation on- and off-line.

Glasgow

- ESESS project has helped to improve classroom practice in science, particularly, practical work and experiments;
- Teachers feel more motivated and confident about covering the science topics addressed by the units;
- The materials have been very enthusiastically received and are being shared;
- Teachers believe that the relevance of content and design of the practical components is promoting pupils' understanding of science concepts;
- Pupils could understand and use science vocabulary and confidently understood the Learning Intentions and Success criteria;
- Overall, teachers believe that the guidance materials provided as part of the units and, to some extent, the video cameras have allowed them to reflect on how they teach science;
- Teachers are sharing new ideas on teaching science with others in their school based on their experience of the units;
- Teachers reported successful engagement with pupils – practical components being seen as a key reason for pupils' enthusiasm;
- The Curriculum Learning Outcomes were achieved by most pupils involved;
- Pupils, regardless of gender and ability, were actively involved in the activities and practical experiments;
- Pupils were enthusiastically using scientific terms and concepts relevant to the units;
- Experiments also helped develop pupils' evaluative understanding, team working and discussion skills;
- Pupils were also able to engage in the wider social and ethical debates that some of the units stimulated.

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Conclusions

Effective learning for adults or children occurs when they are given opportunities to engage in shaping their own learning through practical experience as part of the learning process. We also find it important that students should be able to test their knowledge via interacting in an enquiring way with their learning context and solve real world problems. Students' participation and interaction can be a part of traditional face-to-face education or take place online in a virtual learning platform. The crucial factor is the engagement and the communication, not the environment.

Future Work

Our aim is to use and develop these ideas for student motivation further in our future collaboration for technology enhanced adult learning in the ICT4AL project during 2013-2016.

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PLAYING GAMES: DO GAME CONSOLES HAVE A POSITIVE IMPACT ON GIRLS' LEARNING AND MOTIVATION?

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Games in education

To understand the use of games in education, we must identify the different types and how they are adopted into the classroom. Caillois (1961) proposes that games can be divided into four main categories: agon, alea, mimicry and ilinx. Each type of game, in its broadest sense, serves a different purpose; correlated to games played today. Prensky (2001) specifies six key elements that make up a game, rules, goals and objectives, outcomes and feedback, conflict/competition/challenge/opposition, interaction, and representation or story. Games-based learning is a relatively new concept combining 'serious learning' and 'interactive entertainment' to enable learning (Prensky, 2001). In the last decade there has been a shift in the way teachers incorporate games into learning. Gamification places the techniques of games into real life situations, to engage users with problem solving skills and employs game rules and player experiences to help support active learning (Lee & Hammer, 2011) with lessons designed around the game rules.

This study uses the terms 'game console' and 'video game' interchangeably. A game console is an electronic device that is used to play video games and is usually handheld (De Freitas, 2006, p.9). Commercial off the shelf (COTS) game consoles are the most familiar to children, so we focus mainly on these types of games and their use in the primary classroom.

Learning theory and games

The social constructivist theory first proposed by Vygotsky (1978) can be used as a framework to explain games based learning. It is based on the premise that society plays a central role in children's learning and development, influencing learning initially through social interaction and then more independently as the child matures (Vygotsky, 1978). Vygotsky's 'zone of proximal development' (ZPD) proposes two levels. Firstly, the actual developmental level is what the child can achieve at present through problem solving independently. Secondly, the potential developmental level is what the child can achieve with adult guidance from a 'knowledgeable other' in problem solving. The ZPD is the distance between these levels (Vygotsky, 1978). Although Vygotsky's theories were introduced long before games-based learning, it is still a credible source and can relate to games-based learning in schools. For

Savery and Duffy (1995) the three components of constructivist learning are interactions within the environment, cognitive conflict and collaboration.

Multi-user gaming promotes social learning where pupils collaborate (Oblinger, 2004,) but there is confusion around Vygotsky's use of the term 'teacher'. Arguably, contemporary learners may not require teachers, favouring the use of technology to support learning. Theoretically, game consoles and video games could substitute for the 'more capable peer' or teacher. Wood *et al* (1976) develop Vygotsky's theory and introduce the term 'scaffolding' which Bruner describes as support offered by teachers during problem solving. Thus children can solve problems that would be impossible without guidance. If technology can supplement the teacher role to become a 'mind tool' (Jonassen *et al,* 1999) games consoles could scaffold the child's thinking and learning. Scaffolding allows for more complex thinking, allowing learners to more deeply engage in learning (Hogan & Pressley, 1997). Problem solving and problem finding is essential to enable learning (Rummel & Spada, 2005) leading to further discovery.

Game consoles and learning

Gee (2003) identifies 36 principles of learning and contends that video games are powerful learning tools for contemporary learning. Byron disagrees, (2008) arguing that video games are inappropriate for children's learning because of their content, but we must be aware however, that as Gee argues, learning does not always occur within the content of the game. It is the way they are learning through the use of a game using semiotic domains. One example is small scale study into teachers' and students' attitudes to using games for learning. Findings showed that teachers found computer games-based learning improved motor cognitive skills, ICT skills, higher order thinking skills, knowledge and social skills (Sandford et al., 2006). However, the majority of this research was based on teachers' and students' opinions and no evidence of students' achievements were gathered. For research that shows the student's achievement whilst using games, access to performance data would be a more valuable insight. Tüzün et al. (2009) found significant learning gain from the use of computer games in Geography. They found that children could understand and correctly answer specific questions after playing the game.

Gaming and motivation

Student motivation can be defined as the amount of attention and effort that an individual puts into different activities (Brophy, 2010). It is an important aspect to learning and the individual (Maehr & Meyer, 1997). Maslow's well know human needs hierarchy is arranged in order of physiological, safety, love and belonging, self esteem and self actualisation all of which can affect motivation. Atkinson et al. (1990) place motivation in three categories; survival, social and curiosity, identifying the fulfilment of the lower level of needs before progression can be made up the hierarchy. Therefore, in education children may need to be satisfied at the lower level before they will be motivated to learn. However, Maslow's theory

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has some limitations as it is unsure to what extent self actualisation can be achieved. A recent study illustrates a quadrant of player motivation. It suggests that the four main levels of motivation that players experience are immersion, cooperation, achievement and competition.

Gender differences and games

In recent years there has been a growing interest in the use of technologies related to gender. According to Yukselturk and Bulut (2009) there is an increase in females' usage of technology. For many years there have been suggestions that digital games are a male leisure activity and are targeted towards a male audience (Cassell & Jenkins, 1998). However, this research is based on outdated technology. Recent market statistics from GameVision show 16.7 million active gamers in the United Kingdom (UK). Out of these, there are more male players than females and females tend to play the Nintendo Wii and Nintendo DS. Statistics show that female game players prefer to play games together. Moreover, it revealed that there has been an increase in female players. According to Bryce and Rutter (2003) there are two aspects of gaming that are gender constrained; nature and context of the game. However, most of the research they reviewed was carried out in the 1980s and 1990s. Another study showed that there were differences in online game playing between males and females in terms of self-efficacy, playfulness, behaviour and anxiety (Wang & Wang, 2008). Another study explored the gender differences in 'flow' whilst playing computer games (Inal & Cagiltay, 2007) and found that boys were in flow when they were affected by rules and game play and girls by the story theme. Boys and girls playing habits were different. This literature review suggests that in recent years disparity between females and male game playing is disappearing. The review of literature on classroom games reveals a gap in the research around gender differences and using games (Wang & Wang, 2008) but much is biased toward male gaming. Bearing this in mind, this current study set out to investigate whether games consoles had a positive impact on girls' learning and motivation.

Method

The population of the research are all girls in the UK that attend a school that uses game consoles to support learning. The convenience sample of participants comprised of 49 primary school girls from three schools in Key Stage Two (aged 8-11) Year Three (n=20), Year Four (n=1), Year Five (n=16) and Year Six (n=12). A convenience sample was selected because it was the method of sampling that was less time consuming and the number of schools that were willing to take part in the research was limited. However, there are limitations to this sample, for example Cohen et al. (2007) identify that this type of sampling does not allow for generalising to the population. The practice of convenience sampling is often considered weak due to the sample not being correctly established (Denscombe, 2007). However, due to the limited time this was the most suitable sample method to carry out. Only schools that had incorporated the use of game consoles into their curriculum were asked to take part. The participants were identified using Twitter and via email. Ethical approval was

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granted but due to the ages of the children the class teacher and head teacher, acting in *loco parentis* gave permission for their participation. Participants were aged 8 to 11, so informed consent was given before each took part in the research and each was informed of their right to withdraw at any stage of the research.

Instrument

We used a semi-structured questionnaire consisting of 18 questions. The questionnaire collected quantitative and qualitative data to discover if game consoles had a positive impact on girls' learning and motivation. A range of questions was asked, fitting different purposes, and allowing for a greater depth of data analysis (Cohen et al., 2007). The types of questions included: dichotomous, scales, multiple choice and open ended. The qualitative data gave an understanding of the attitudes and feelings of the participants which garnered a deeper understanding of their thoughts, lending authenticity and depth to the data received (Cohen et al., 2007). Despite these strengths, research using this method can be very time consuming, therefore, only three qualitative questions were included. Quantitative data was the main source of data collected. This was because it would be easier to analyse (Cohen et al., 2007). However, there are potential limitations when using this method, where questions can be interpreted differently, affecting the validity of the data (Bell, 2010).

Procedure

Prior to distribution of the questionnaire, two Key Stage 2 children (aged 8-11) piloted it to determine whether the instrument was suitable for their age group and to ensure the questions were not ambiguous and could be understood. All participants completed the questionnaire using Google Docs. However, due to the specific sample it took time to receive any data, and it was difficult getting schools to partake in the research. This may be due to many schools feeling invaded when researches try to carry out research on their pupils or the lack of time teachers have. Despite these difficulties a sufficient sample was collected during this research.

Analysis

Data were analysed using a range of tests to gain a better understanding. Firstly, a Pearson-product moment coefficient of correlation test was used to determine if there was a relationship between two variables and to measure statistical significance. This Pearson test was used because it is reliable and commonly applied to data analysis (Cohen et al., 2007). Cross tabulation tests were carried out with the Chi- square tests to analyse nominal data to detect any significant relationship between any two categories. Lastly, open ended questions were analysed using thematic analysis, seeking patterns and key themes to emerge, thereby allowing us to discover any relationships or emerging patterns within the responses (Garza, 2004).

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Results showed that of the 49 girls who participated in the questionnaire, 33 said that they used video games at school and 36 girls used video games at home. The types of game console they used at school and at home are shown in Figure 1 and 2. 27 % of girls used video games at home every day. 41 % used video games once a week and 41 % of girls used video games at school whereas 41 % used them once a month. The majority of girls used game consoles to support learning in Maths and English.

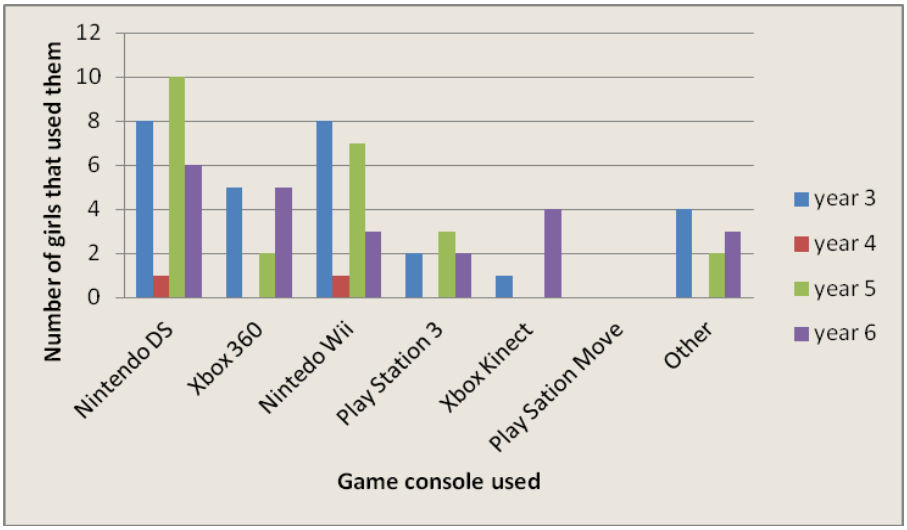

Figure 1. Games Consoles used at home

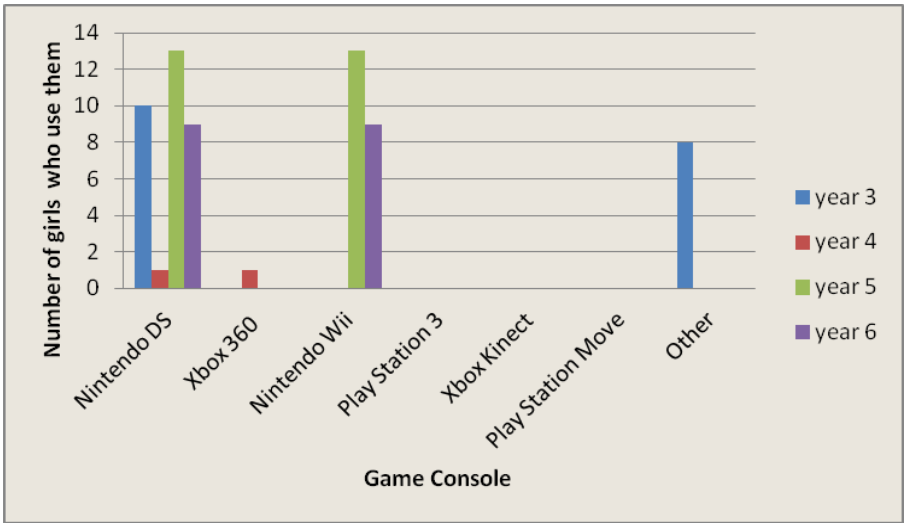

Figure 2. Games Consoles used in school

Discussion: quantitative data

Having analysed the data using quantitative approaches there are some significant links between school and home in terms of game console usage. As indicated in Figure 5, the children that used video games more frequently at home also found using them at school fun. As previously stated; there are 16.7 million active gamers in the UK. This suggests that a majority of children already use games for leisure. Prensky (2001) suggests the 'games generation' are children born around the culture of game playing thus are 'active participants'

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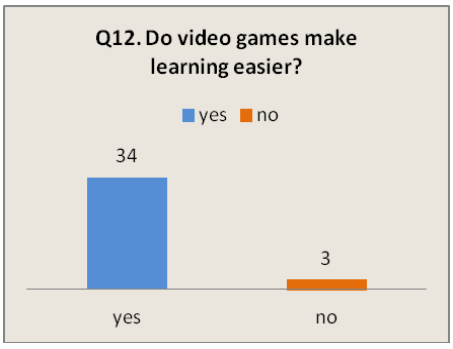
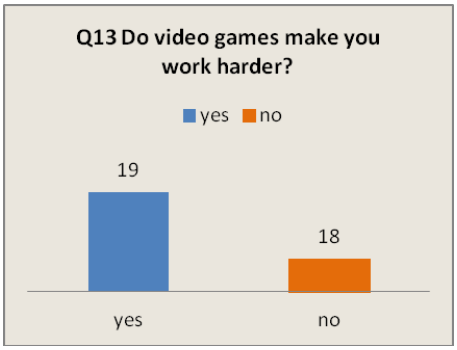
who are interacting with games and are familiar with games from an early age. This would then suggest that because children are familiar with games, and they think differently from the 'digital immigrants' that they will find it easier to learn when using video games at school. However, there is much debate on the topic whether the 'game generation' or 'digital natives' and 'digital immigrants' actually exist (Selwyn, 2010). Furthermore, due to the economic background of pupils this may not be the case. Prensky also generalises, therefore, could be considered biased. It may be questionable whether implementing technology, such as game consoles, into education is beneficial because children use them at home when in fact they may not. Nonetheless, this research indicates that girls enjoy using them at school when they have used them at home and this can motivate and support learning. The schools who participated in the research have used game consoles for a period of time; therefore, the children are still motivated even though the technology has been in the classroom for a while.



Figures 3. Do video games make learning easier?



Figures 4. Do they make you work harder?

The data also indicate that children who agree with using video games at home are fun found that it made them work harder at school and they would rather use them to learn. Therefore, girls' attitudes towards video games are positive, and they see the positive impacts video games have to offer. This relates to the literature (Sandford et al., 2006) as students in this study reported on the motivating aspects of game consoles. The study also suggests that motivation is likely to rise if children use game consoles familiar to previously used consoles at home.

Pearson Product Moment Correlation Coefficient testing (one-tailed) revealed an expected statistically significant correlation between pupils attitudes towards the statement 'video games at home are fun' and how often they played video games at home ($r = 380$, $p <$

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.05).Those pupils who tended to play video games more often found them enjoyable whereas the pupils that did not play them that often did not find them as enjoyable. Another statistically significant correlation was found between how often pupils use video games at home and pupils attitudes towards the following statement 'video games at school are fun' ($r = 0.358$, $p < .05$). Pupils who used video games often at home found them enjoyable in school, whereas the pupils who did not use them at home did not find them enjoyable in school. Lastly, a statistically significant correlation was observed between pupils' attitudes of using video games at home and using video games at school ($r = 0.380$, $p < .05$). This relationship showed that children who enjoy using game consoles at home also found them fun to use at school. Whereas, children who did not find them fun at home, did not enjoy using them at school.

Qualitative data

Qualitative data was gathered to gain a richer understanding of the girls' reasons for their use of game consoles in school. From questions 16, 17 and 18 there were key themes that have emerged. The key themes highlighted are learning and motivation. A relationship was found between girls' learning and girls' motivation. Many girls suggested that the reason they use video games is because they enjoy and find them fun. Girls were asked: If you find it fun using video games, why do you find them fun and use them? Some responses are shown below:

> *"It makes learning fun" (Year 6 girl).*
>
> *"Because it helps my learning and it does it in a fun way and not a boring way" (Year 5 girl).*

These statements suggest a relationship between learning and motivation. This contradicts Whitton's (2007) research that showed that there was no significant relationship between learning and motivation. However, these statements are only student's perceptions; therefore may not create a true picture because there is no evidence suggesting a rise in attainment and the level of motivation that is occurring. There were also some interesting responses to the question: Why do you not use video games?

> *"Because sometimes they are not good for your brain" (Year 3 girl).*
>
> *"Because they are a waste of money if we buy them" (Year 6 girl).*
>
> *"You could do better things like being active" (Year 6 girl).*

These answers may have a degree of bias. It could be supposed that teachers, parents and peers may have influenced these answers may exhibit demand characteristics (Orne, 2009) influencing reliability of responses.

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Conclusions

The small-scale research carried out cannot be generalised, however, it does give some indication to why girls use game consoles and their attitudes towards them. This research shows that children feel that they are learning from them and find them fun whilst using them in the classroom. It shows a clear link between the home and school use of game consoles, indicating that children who are familiar with them at home find them useful at school. However I did not explicitly answer the research question due to limitations. The findings may contribute to teachers that use or want to use game consoles in their classrooms to motivate and to support learning. Further research could be conducted to compare the impact game consoles have on boys and girls to see if there is a significant gender difference. An experiment measuring learning and motivation when using game consoles with a control group may be more suitable to discover specific learning gains. This might then show the impact of game consoles, thereby providing educators with evidence needed to justify their use.

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ADAPTIVE AND ADAPTABLE GAMEPLAY: AN INSTRUCTIONAL DESIGN APPROACH FOR INDIVIDUAL DIFFERENCES

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Abstract

Although the use of educational games is nowadays widely accepted in public opinion, its effectiveness in terms of learning and motivation has not been firmly corroborated. A first reason for this is that research on instructional design often does not interact with the fields of game design and development. Consequently, instructional design principles that have been shown to be effective are typically not taken into account in the design process of educational games. A second reason for the mixed results in effectiveness research is that educational games rarely cater for individual differences between players, and research on adaptive educational games is rather sparse. This paper presents an instructional design approach to realizing effective adaptivity in educational games, and discusses various player and gameplay characteristics that can be integrated in learner/player-centred adaptivity algorithms. We apply this approach to the award-winning educational math game *Monkey Tales*.

Introduction

The majority of educational games today seems to implement a low-resolution form of adaptivity at the level of individual players, based on player profiles that are being obtained by stereotype modelling. For example, a player can be assigned to one of three difficulty levels based on a prior knowledge test. The problem with this low-resolution approach, however, is that classification is based on one single measurement at a certain moment, and that players are assigned to groups or predefined player types. Moreover, these adaptivity models often don't take players' game skills into account. In contrast to the low-resolution approach, a micro-adaptive approach is more dynamic, fine-grained and player-centred. For instance, the attempts on single items can be logged so that errors can be analyzed at run-time, or reaction times can be logged and used for realizing run-time adaptivity.

Taking an angle of attack inspired by educational research on individual differences, this paper presents an overview of player and gameplay characteristics that can be taken into account when developing micro-adaptive algorithms for educational games ("adapt to what?"). It also suggests possible player-centred adaptations ("adapt what?"). Thus, targets

and sources of adaptivity are distinguished. This framework is applied to the award-winning educational game series *Monkey Tales*.

The educational game

The *Monkey Tales* series (http://www.monkeytalesgames.com) was designed for mathematics practice in elementary school, and comprises math content/rules (e.g. table of six, subtraction up to 100) based on the national curriculum for math instruction.

Figure 1. Cypher Shooter with math rule 'even or odd'

The goal of the game is to liberate monkeys by solving 3D puzzles and by opposing these artificially intelligent (AI) monkeys in mini-games. Each of the 48 mini-games focuses on a specific math rule, and requires the learner to correctly solve items for this math rule (e.g. item '8 x 6 = …' for the rule 'table of six'). The game features six mini-game types, which involve different game mechanics. For example: in Cypher Shooter (see Figure 1), players must throw balls at correct answers by pointing and clicking with the mouse, but in Number Cruncher (see Figure 3), they must navigate to and shoot correct answers by means of the arrow keys and space bar while trying not to be hit by falling slime. If players win a mini-game, they liberate a captured monkey and advance to a new puzzle and mini-game, containing a (presumably) more difficult math rule. If the monkey wins, the learner has to repeat the game, but with easier rules, until s/he wins. Thus, in short, the current adaptivity algorithm offers easier or more difficult math rules on the basis of, respectively, previous failure or success on mini-games.

Concerning this existing adaptivity algorithm, we know from qualitative user-testing with the *Monkey Tales* product, it takes too long for some learners before they experience any challenge. So, other player and gameplay characteristics can be taken into account when developing other and more micro-adaptive algorithms. At the same time, these new adaptivity algorithms could serve less advanced learners and/or gamers.

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Source of adaptation ("adapt to what?")

Before defining the characteristics that can be taken into account for realizing effective adaptivity models, one should first define the purpose of adaptivity, such as: to improve (the efficiency of) learning (gains); to improve transfer of knowledge to situations outside the gaming context; to optimize challenge, fun, etc. for the learner; to optimize a learner's metacognitive skills such as self-regulation, planning and monitoring; to optimize learners' collaborative skills. Depending on the purpose(s) chosen, adaptivity models will operate on different measurements and learner models. For example, if the purpose is to improve learning (gains), the learner model will need to focus on measurements that represent the acquisition of knowledge, the transfer of knowledge to other in-game situations and the remediation of knowledge gaps. If, however, the purpose is to optimize challenge and fun, then adaptivity models could focus on the measurement of knowledge in order to provide an optimal balance between what the learner already knows and what the learner should acquire. There are two types of adaptation sources, viz. player characteristics and gameplay characteristics. Relevant characteristics can then be combined into game states (see below), which define which adaptations are eventually performed.

Player characteristics

Player characteristics comprise characteristics of individual learners (known as 'individual differences' in the professional literature), and can either be measured before a player enters the game or, more dynamically, while a player is engaged in gameplay. However, the (arguably) greatest challenge to including this characteristics in adaptive game algorithms is to measure it unobtrusively (see further). The first set of player characteristics can be called prior player characteristics and comprises the following characteristics:

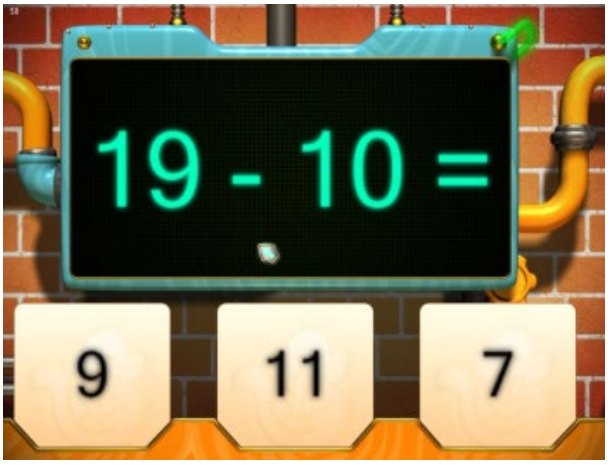

Figure 2. Unobtrusive measurement of prior knowledge

1. **Prior knowledge.** In the *Monkey Tales* series, prior knowledge can be measured by offering multiple choice items at the start of the game (see Figure 2), after which the player is directed to the most appropriate level of difficulty given his/her knowledge at the start of the game.

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2. **Learning style/cognitive style/cognitions.** Although the issue of learning styles is a hot topic in educational research, empirical data on the effectiveness of learning styles-based adaptivity is nonexistent. In addition, we must bear in mind that learning styles can be highly dependent on the domain that is being learned. An alternative is to look at learning preferences instead of learning styles (Rowe et al, 2010). It has been suggested that learning preferences such as background knowledge and interests are strongly related to style of gameplay (Rowe et al, 2010). For example, a player's perceptions towards games as a tool to learning will influence motivation, willingness to engage and gameplay behaviour. In turn, this will influence learning outcomes and the overall effectiveness of the game. Hence, it is important to consider players' attitudes towards math (e.g., math anxiety), their learning or gameplay goals, their prior experiences with math learning, and their specific cognitions about games as a method to assist math learning, because these can mediate the effectiveness of the game.
3. **Gaming skills.** Gaming skills can influence gameplay behaviour significantly. Gaming skills comprise both (1) metacognitive skills such as spatial skills and problem-solving skills (e.g., skill needed to evade slime in Number Cruncher) and (2) more general IT skills such as reaction speed, mouse and keyboard accuracy. Insufficiently developed gaming skills can result in the system underestimating a learner's actual knowledge, since not all errors made in gameplay are due to a lack of math skills. For example, in *Monkey Tales*, if a player often gets trapped in slime in Number Cruncher (see Figure 3) and hence loses the mini-game, this may be an indication of lack of reaction speed, perceptual skills, or spatial skills, rather than of a lack of math knowledge. More fine-grained adaptivity could be realized by means of dedicated gaming skill tests for each mini-game type (see e.g. Figure 4). Such gaming skill tests comprise the gameplay without the math content. Measurements of accuracy and reaction speed could then determine the amount of challenge that is extraneous to the challenge inherent in the math content (e.g. behaviour of the AI or gameplay elements such as the falling slime).

Figure 3. Number Cruncher

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4. **Personality.** Previous research has demonstrated the relevance of including personality traits in the learner model (Major et al, 2006). It can be hypothesized that certain personality traits will also affect a player's behaviour in educational games. For example, players with a high level of openness, conscientiousness and extraversion would be eager to learn and quickly master things (Teng, 2008), e.g. rapidly go to the next mini-game and win it.

Figure 4 Gaming skill test for Number Cruncher

5. **Goal setting.** The types of goals which learners set for themselves (Elliott & McGregor, 2001) may also provide information for player-centred adaptivity models. Depending on the goals a player has set, different adaptations can be offered, such as content (e.g., more instructional support when losing a mini-game, more items in mini-games), or positive feedback (e.g. bonus points) can be given.
6. **Motivation.** 'Motivation' is a complex construct, to which the variability of theories (also in game domains, e.g. (Yee, 2006; Rigby & Ryan, 2007)) testifies.

In addition to (relatively stable) prior player characteristics (as discussed above), runtime player characteristics can be taken into account when defining the adaptivity model. Such runtime player characteristics can change during and because of gameplay. For example, before a player enters a game, he/she can have a very low degree of 'motivation', which the adaptivity algorithm can take into account. However, a player's 'motivation' can change because of positive interaction with the game (i.e., the player wins, liberates several monkeys and is more motivated to persevere). If the adaptivity algorithm is then not able to change the game state from low-motivated to high-motivated, then there is the risk that the player's motivation decreases because the game environment is no longer adjusted to the changed motivational state of the player. To tackle this problem, the following runtime player characteristics can be taken into account:

1. **Motivation.** Because multiple run-time unobtrusive measurements of motivation are hardly possible to realize, motivational states can be inferred on the basis of in-game behaviours such as reaction times, etc. However, to date and to our knowledge, probabilistic models for measuring motivation at run-time on the basis of player behaviour have not yet been empirically validated.

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2. **Gameplay skills.** As players proceed through a game, they acquire skills, are able to react more quickly or more accurately, etc. In order to tackle this, two approaches are possible. First, if gameplay skills are measured as prior player characteristics, then an algorithm could take into account a likely increase in these skills. Alternatively, gaming skill tests can be offered multiple times to recalibrate the algorithm.
3. **Knowledge and goal setting.** As with gameplay skills, a player's knowledge of the domain (e.g., math) and of the game environment can increase during gameplay.

Gameplay characteristics

This second group of characteristics includes learning process characteristics and learner behaviour. These are strongly linked with the domain model (e.g., math, language, physics), in which domain structure, knowledge components or item categories are represented in such a way that there is a logical structure in the learning materials. For example, difficult math rules may require more cognitive processing and may thus lead to longer reaction times without this being an indication of inappropriate gameplay. Another typical process characteristic is the use of (instructional or technical) support.

Game states

Instead of creating simple rules that associate a system's reaction with a certain measurement of a player or gameplay characteristic, it is possible to create game states. Game states are inferred by using the logged values of relevant variables (as discussed in the previous sections) and by subsequently modelling them into an overall game state. More specifically, game states of players can be developed by a combination of player and gameplay characteristics. In order to infer game states, a probability model can be developed, in which several characteristics and links between those characteristics are drawn. Each link can be given a certain weight, depending on, e.g., the initial states, on prior player characteristics, or on the goals of the educational game.

Gamestates as input for adaptive instruction ("adapt what?")

Once singular variables or game states have been defined as sources of adaptivity, instructional and game designers must decide on the target(s) of adaptation, such as (a) Gameplay mechanics (e.g., adjusting the speed of the AI, obstacles); (b) Game scenarios (e.g., storylines); (c) Game objects (e.g., add non player characters); (d) the types and level of feedback (both game-like rewarding and instructional feedback, such as elaborations of math problems); and (e) Learner control. In addition to the system-controlled adaptivity, the adaptability of the game by the learner can also be a target of adaptation. More experienced learners and players with more self-regulation behaviour and increased knowledge can be given control over some features of the game. For example, after winning a mini-game, a next math rule can be offered but the player can choose the type of mini-game, the speed and smartness of the AI, the amount of correct items to win a mini-game, mini-game characteristics (e.g. the amount of bonuses and obstacles), etc.

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Conclusion

In this paper, two dimensions of adaptive instruction have been discussed: sources and targets of adaptivity. The sources include player and gameplay characteristics, and may serve as input for creating game states. Based on the sources, it can be defined what elements in the gaming environment will be adjusted (i.e., targets of adaptivity). Although source and target of adaptive instruction can be considered as crucial components in adaptive instruction, the framework for adaptive instruction also includes the time of adaptation (i.e., static or dynamic); method of adaptation (i.e., learner-controlled; system controlled; shared control) and context of adaptation (i.e., device, time, place) (Vandewaetere & Clarebout, 2012). It should thus be noted that the topics covered in this paper only represent a small, although significant part of the broader framework of adaptive instruction.

With the conceptual framework presented in this paper, educational games researchers now have a tool that can be used to perform the following research steps:

1. the creation of game states based on valid and reliable measurements of player and gameplay characteristics;
2. the experimental validation of game states; and
3. the overall effectiveness of adaptive educational games.

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NEW TOOLS FOR NEW STUDENTS – GAME ABOUT DECISION MAKING ADAPTED TO VARIOUS LEARNING CONTEXTS (GADEMAVO)

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"Play is our brain's favourite way of learning thing" (Ackerman & Sis, 2000)

Abstract

The University of Applied Sciences Western Switzerland (HES-SO) faces various challenges. One of the main challenges in the curriculum HES, in every faculty, is to train future professionals to be able to understand real life problems, sometimes critical ones, to sort and organize a plethora of information and make appropriate decisions in extremely fast and changing situations.

On the other hand, university teaching experience shows that students regularly express difficulty in transferring theory to professional practice, particularly in crisis or emergency situations. Besides, if they are able to apply procedures adequately, they are less prepared to produce new solutions to solve complex cases. The e-learning center HES-SO Cyberlearn believes that providing them with a small-scale simulation game will sustain the emergence of proper competence and help students adapt to their future professional world.

Based on problem solving and decision making, GADEMAVO (GAme about DEcision MAking adapted to Various learning cOntexts) simulation game offers our so-called digital native students a new instrument. Based on playful interaction, GADEMAVO will also provide concrete and meaningful information to students in terms of practical use and feedback, with the aim of helping pedagogical designers realize adapted instruments, fitting the expectations of this new public.

New student profiles, new teaching models

The teaching model mostly used in universities is based on oral transmission, inspired by the Peripatetic school founded by Aristotle[1].The entire knowledge is in the hands of the Professor.

In our modern world, he can supplement his teaching with an array of physical tools (blackboard, retro-projector, video-projector) and computing tools (PowerPoint or Prezi

presentations, etc.). The audience, crammed in over-crowed lecture halls, listens and the only interaction with knowledge consists in note-taking and practical projects, miles away from ex cathedra lectures.

Compared with older times when, as a disciple worshipping a Master, the student would be listening silently to one of the highest authority in the making of knowledge, the 2012 student profile has, indeed, evolved towards one whose expectations and requirements are new.

Family educational methods based on dialog, integration in a more horizontal society, the impact of mobile technologies, immediate access to a plethora of knowledge available on the Internet, current society's requirements (people capable of taking decisions, thinking ahead, ranking and cross-checking data), have all contributed to shaping up a new student. Whether we use the term Student 2.0, the Now Generation[2], Generation Y, the famous "heorized digital natives" so-called by Prensky (2001, 2001), every professor will immediately pinpoint the idiosyncrasies. For such students, the act of thinking has become more important than knowledge itself, beliefs take the upper-hand on facts, the attention span has decreased dramatically, and collaboration during the learning process reaches out world-wide, authority has no genuine hold on them.

In order to reach the training objectives set by the curriculum and fulfil the professional world requirements of the future graduates, while taking into consideration the characteristics of these new students, it is essential to change the old teaching habits. A possible orientation would consist in offering students a wider variety of interactive learning resources, such as simulation and serious game-playing

Games for learning

Studies undertaken by Piaget on knowledge building-up, by Dewey, Freinet (1964) or even Montessori (1912), who stemmed from the active pedagogical school, have demonstrated that playing games contributes significantly to the learning process. Additionally, two inquiries undertaken in 1993 and 1999, led by researchers at the University Paul Sabatier (science and medicine) (Toulouse III)[3], reveal that 77.5 % of students appreciate serious games, and one third claims that the main attraction of a game consists in studying without being aware of it. The most recent inquiry dealt with oral activities carried out in all first year cycles at the IUT University. The use of games was voted in by 87 % of the students. Only 37 % claimed to enjoy magisterial lectures.

Moreover, this audience shows another aspect of the learner's profile and reveals new characteristics of daily life which impact on a student's life. Keen on interaction with knowledge, wishing to act as a co-expert of knowledge, actually positioned as a customer capable of recognizing its needs and wishes, little inclined to longer concentration periods when the required tasks do not seem to make sense, Generation Y (born between 1980 and 2000) clearly change the way professors consider knowledge transmission. How to make the

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best use of these characteristics, rather than fighting them in order to contribute to the learning process? This question gave us food for thought when developing the GADEMAVO project. As Prensky noted: "students will not have short attention spans for learning if the approaches you take really engage them. It is possible to get learners of all ages totally involved in learning any subject matter" (2007)[4].

Generation Y is characterized by various characteristics. Among them, we focus on its playing habits and their taste for video games. More than a hundred thousand copies of the "GTA 4" game were sold in Switzerland, to state just one example. The MMO (massive multi users on line) among the French community reaches up to 25 % among the 18-24 age range and 19 % among the 25-29 age range (http://www.jeuxonline.info/statistiques/). Although all students are not compulsory gamers, many play regularly, be it mini games available on their smartphones.

From a pedagogical point of view, using games seems a pertinent approach based on this new learning profile, to involve students, confront them to new ways for addressing knowledge and make them progress in a significant manner. Without replacing the older teaching means, a relatively moderate use of games might encourage students to interact, be active, and be participative, while at the same time getting immersed in a well-appreciated fictive and playful universe, making it possible for the professor to maintain their attention, to strengthen their participation and to reach the set learning objectives.

The GADEMAVO game

The e-learning Center HES-SO Cyberlearn has, therefore, decided to refer to an actual case in order to estimate the possible benefits brought forward by using such a game in some of its university courses, by developing a simulation game. We have developed a game centred on problem solving and decision making, in a context close to real life professional situations, which the students might come across after graduation. Our objective is three-fold:

- Engage the student;
- Contribute to the development of the student's ability to make decisions in a complex environment;
- Test the use of this game among this audience and assess the results, both from the point of view of the professors (reaching learning objectives and involving students), and the students (offering an unprecedented learning experience and improving their competence).

Problem solving and decision making, although not explicitly taught (except in the context of nursing, where clinical reasoning is a full-fledged field) provide an interesting topic for a game, to induce a student in trying to find his own solutions rather than rely on given procedures. This topic fits in well across most courses taught in the HES-SO schools. In this, in-the-field university, training future professionals, we thought it advisable to adapt the

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selected topic to the targeted professional context. Thus, with GADEMAVO, the professor can simulate the professional experience by embedding it easily and simply into the game parameters. We designed the game to be of simple and effective use, both for the player and the professor who wishes to include the game among his teaching tools.

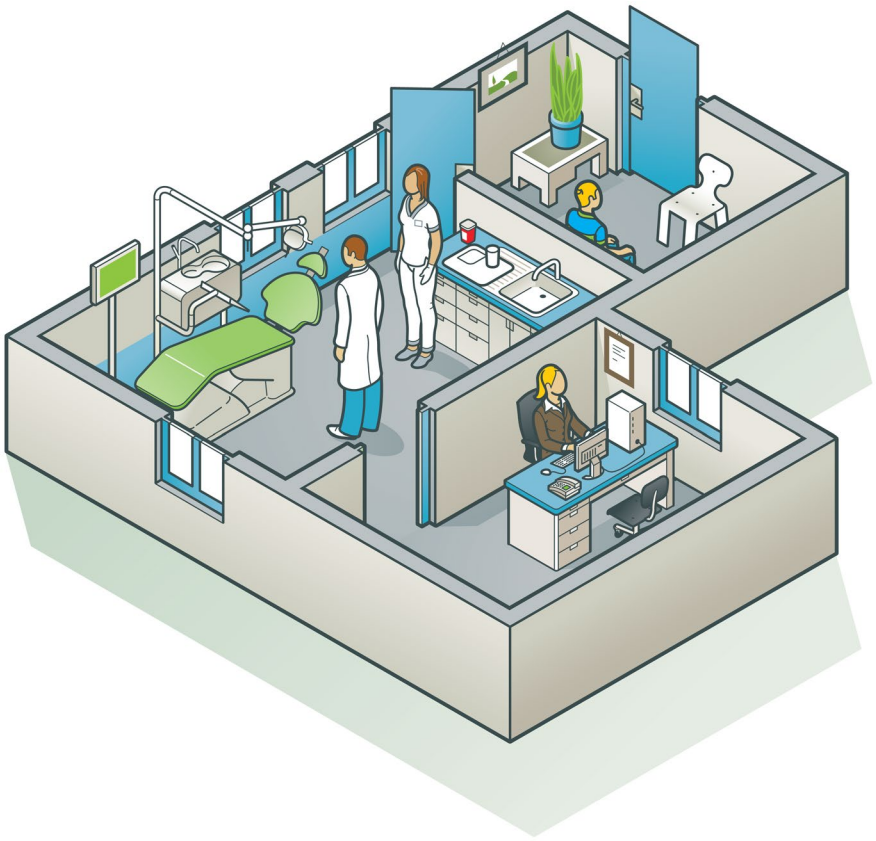

Figure 1. GADEMAVO environment

The game itself comprises an administrative interface, where the professor can customize the game parameters to the desired professional context and to the gaming procedures he wishes to adopt (interface, awards, game mode) and a client interface, in which the students can play.

The game is played during one week, as a group, on a computer in real time and/or out of the classroom. Once the game is completed, the professor proceeds with the debriefing in presence of the group. The students develop the game from a practical case, with details given step by step. According to the context, they are confronted to a client or a patient and must collect two types of information:

- Arising from the **client/patient's** request and his personal problematic (problem encountered by the patient, client), based on information delivered in text or multimedia format.
- Arising from **previously analyzed data** provided by the system (laboratory analyses, examples of enterprise jobs in need of added value etc.)

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The main mission of the game consists in analysing the demand, the needs and the data of a patient (respectively a client) and to take the suitable decisions, with the help of various problem solving tools (SWOT, Risk Management, brainstorming, checklists, discovery matrix, etc.) proposed by the system and used outside of the game context.

A system of won or lost points and certification rules the action in the game.

Different steps in the game enable to pass from data collection to decision taking. Students can see the progression of other groups also playing with GADEMAVO and can ask for help. They can also hire new competent "virtual people" to join the game, in order to solve some of the proposed problems. By answering various quizzes they can win objects which will allow them to interact with the collected analyses.

When they are ready to take a decision, they can propose it to the client/patient, get some feedback and re-submit this step up to three times, while refining their proposition at each step.

A number of sub-missions are proposed to students related to the topic of the game (winning useful objects) or unrelated ones (killing a cockroach). The game evolves by integrating events selected by the professor (change in budget volume (communication), worsening of a patient's condition (physiotherapy) forcing students to reconsider their analysis. This data is made available to participants and they are reminded of it during the game. The specific feature of a pedagogical resource based on gaming can be summarized by three aspects:

- adaptability ,
- conflict, competition, challenge, opposition,
- embedding the learning item into a story.

We have dealt with GADEMAVO's adaptability on two levels:

1. **Instanciation**: the professor organizes the game according to his preferences, and so he can adapt the metaphor to the desired context, he can define the game's difficulty level, he can provide the case scenario and the resources linked with the case, he can define the impact on the client/patient
2. **Playability**: the game can be adapted in various way:
   - The oval room space can be customized according to the player's wishes and this will trigger off more or less information on the part of the client/patient (customization of the office/surgery),
   - Objects can be won, which impacts on how the information concerning the case is "read" and interpreted ; competent personnel can be hired to help with understanding/analysing data or performing a basic task,

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- The state of the data progresses according to the various data items sent to the players when the condition or circumstances around a patient/client /mandate change
- Decisions taken by the players are applied in three iterations; in the first two iterations, the impact of the decision on the client/patient is made visible by an "emotional" feedback (temper, colour, client/patient's responses) which helps the players decide to either maintain their initial decision or adapt it.

Conflict, competition and challenge were designed by developing:

The missions: apart from the game's main mission (analysing data concerning the patient/client, making and applying the right decisions), secondary missions are proposed to the player(s): win useful objects (microscope, computers, etc.) which come in handy for achieving the mission, hiring competent people to complete the team, etc.

1. **Competition among teams**: if the professor activated this option, the teams can see how every other team is performing; help can also be asked or given by any other team, at any moment,
2. **Scores**: every action fetches or costs points to the player(s): winning useful objects for progressing in the game, taking decisions, hiring competent people, asking/giving help to other teams, satisfying/irritating a client/patient, etc. A graduation tool completes the system: for every 200pts won, the player(s) is given an honorific promotion, thanks to certificates for on-going education: beginner, expert.

Embedding the learning object into a story is represented in the game as follows : at the beginning of the main mission, in the meeting room, the player(s) are told about the story, a role is given to him and he can then customize his avatar by giving it a name, a colour etc. The chosen metaphor induces a certain straightforwardness of the story: one (or more) of the professional welcomes a client/patient and deals with the case. Complexity arises with the choice of a particular practical case and the wealth of data which is linked to it.

Development procedures

The e-learning Center HES-SO Cyberlearn developed this game in the course of the last semester of 2012 and the first term of 2013, in html 5, using the Impact development framework; the game relies on a database which stores the game levels reached by each team and all the associated mechanisms. Eventually, it was the office metaphor which was considered (respectively the medical surgery). The game takes place in three rooms: the meeting room, where the players build their team, receive their mission, win various useful objects for the game; the oval room, where they welcome the client (respectively the patient) and collect information on his case; the situation room, where they analyse all the various collected data proposed by the system (samples, products, blood analyses etc.) and take their decision which is then applied in three successive steps.

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The designing team comprised a specialist in the learning process and serious gaming, four professors, each representing three contexts: physiotherapy, communication and computing development. Each professor involved two students who tested the application from the beta version till the final version. Moreover, a computer specialist and a web designer designed and developed the game from the technical point of view. The game runs on a computer or a graphics tablet such as an i-pad.

The results of the project

Currently, at the time of writing this article, the game is over and the next step, consisting in distributing this product, is underway. We have planned virtual demonstrations in the form of video screening, available on our webpage (http://cyberlearn.hes-so.ch), as well as real time demonstrations in the various HES-SO schools, to engage professors to test the game on a life-size scale.

The next step consists in collecting data to analyse the game's usefulness in the initial three development contexts (health, communication and computing) with entire classes. We will ask the students if they appreciated the proposed method, if the professors reached their teaching aims by proposing this new activity, and also whether the students are better prepared for their future professional world by having used a serious game as an additional learning tool. We plan to conduct a quantitative survey to collect this data and to proceed to qualitative interviews in each classroom. The results of this future survey will lead to a publication about a comprehensive procedure on how to analyse needs and implementation, including user feedback.

Developing a serious game is a difficult task. It not only needs didactic imagination, a professional team with the appropriate competence and able to communicate clearly, but also requires solid support from the professors already overburdened by their daily tasks. If the students are readily interested in using new learning products, the effort involved in developing a serious game is such, that it sometimes becomes necessary to adapt the pedagogical intentions, the design and the game implementation to fit the actual use the students will make of the game, in order to ensure reaching the main teaching objective: enabling natural and effective progression from basics to be acquired to actual competence to be mastered.

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[1] The **Peripatetic school, or Peripatetic**, is the philosophy school founded by Aristotle in 335 BC at the Lyceum of Athens. This term also defines the scholars or followers, both Jewish and Muslim. It stems from the Greek root *peripatein*, "to wander": as Aristotle was believed to wander around while teaching in Athens. http://fr.wikipedia.org/wiki/%C3%89cole_p%C3%A9ripat%C3%A9tique#cite_note-0
[2] The young generation, everything and right away.
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[4] "Les étudiants n'auront pas une faible capacité d'attention en matière d'apprentissage, si votre approche vise à vraiment les faire participer. Il est possible de trouver des apprenants de tous âges totalement impliqués dans l'apprentissage sur n'importe quel sujet." TdA

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SEEKING FOR THE ADDED VALUE OF VIDEOGAMES AND SIMULATIONS

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Introduction

In recent years videogames and simulations (V&S) became a fast growing sector in education. During the last decade, many experiments were made with V&S in education and their number is growing from year to year.

There are essentially two types of experiences with V&S in education:

- Exploit existing products to highlight some fundamental mechanisms;
- Develop products specifically for educational purposes (sometimes called "serious games").

For instance, in the first type, a social simulation game like *The Sims* allow gamers to understand political and economic principles and, especially, the complexity of these mechanisms. *Spore*, a simulation game in the field of Biology is a very good tool for the understanding of some aspects of natural selection. More sophisticated, scholars and management development professionals are using *World of Warcraft* for the learning of leadership skills (Denning et al., 2011; Thomas & Brown, 2009, 2007). A first example of the second type is *Supercharged*, a simulation game whose purpose is the handling of the trajectory of a spacecraft (which is in fact a "particle") managed by manipulating electrical charges. Nowadays there are thousands and thousands of simulations and videogames especially designed for educational purposes.

In this paper we will explore the field of V&S by focusing on its added value for learning. In other words, our research question is: What can be learnt with V&S that cannot be learnt (or poorly) with other pedagogical tools or techniques (such as case studies, role playing, problem-based learning, etc.)? The paper starts by describing the main ideas on V&S and Learning, focusing on our intuition that V&S are a privileged tool for reflective learning. Then the paper will describe an experiment: *The 21st Century Car Challenge*, a business simulation implemented at ESCP Europe Business School.

Videogames, Simulations, and Learning

The recent interest on V&S for learning can be rooted to work of Mark Prensky at the beginning of this century (Prensky, 2001). Prensky – who invented the terms "Digital Immigrant" and "Digital native" – said that there are five levels of learning with games: How, What, Why, Where, and When/Whether. First level (How) relates to game control, e.g. where to click in order to build a certain kind of buildings in a town (like in Sim City, Age of Empires, or Civilization). At the second level (What) the player incorporates the rules of the game, i.e. what can (or cannot) be done. Interestingly, in V&S the rules are incorporated while playing the game, not before, which is usually the case in board games. At the third level (Why) the player learns the strategies needed to win the game. The fourth level (Where) is related to the environment of the game, the player where he/she is totally immersed. Finally, at the last level (When/Whether) the player must make some choices, make decisions, take action and get feedback. It is at this fifth level where the player discovers and understands the reward system of the game.

However, we think that the most interesting quest on V&S and Learning started with the investigation done by James Paul Gee at Wisconsin-Madison University. His research program starts with the finding that many people (especially young people) are willing to spend many hours doing hard, long and complex activities, i.e. playing sophisticated videogames, and they enjoy it. Why these people don't spend so many hours doing other „hard, long and complex activities" such as mathematics, physics, biology, history, literature, etc.? What is in videogames that people love so much? Are there underlying learning principles embedded in games that teachers should apply in the design of their courses? Jim Gee's investigation is aimed at answering those questions.

In his seminal book *What videogames have to teach us about Learning and Literacy* (2003), Gee found 36 learning principles embedded in „good" videogames. We will not describe here all of those principles, we're just going to select some of them that we find especially interesting for our research:

- **Identity**. In V&S players take a new identity, one that matters to them. Within this identity they become committed to the virtual world where they will live and act.
- **Practice**. Players get a lot of practice in a context where practice is not *boring*. They spent a lot of time performing tasks.
- **Interaction**. In V&S, nothing happens until that players act and make decisions. Moreover, V&S do talk back, giving the player feedback and new problems.
- **Risk Taking**. V&S lower the consequences of failure. Therefore, players are encouraged to take risks, explore, and try new things.
- **Well-Order Problems**. In good V&S problems are organized in "levels", so that the earlier ones have a lower level of difficulty and are built in a way that their solutions are the basis for solving the later, harder problems.
- **Help is "Just in Time" and/or "On Demand"**. Content, that one usually finds in textbooks or in teachers' talks, is usually delivered out of context, and students cannot

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tie it to experience; this is why it is so inefficient. In good V&S information is given when players feels a need for it (e.g. when facing a failure), can use it and are ready to use it. Knowledge is to be applied *immediately*.

- **Performance Before Competence**. We think this concept, emphasized by Cazden (1981) and related to assistance to learner in Vygotsky's zone of proximal development, is one of the most powerful learning principles embedded in V&S. Players can perform (i.e. act) before they become competent. Supported by the design of the simulation or the videogame, the smart tools it offers to the player (help tools), and by other more advanced players, beginners can learn to play *while playing*.
- **System Thinking**. Games encourage players to think about relationships, not isolated events or facts. It is a main feature of V&S that players need to think on how each action taken might impact on future actions, their domain of actions, and/or on other players. In our complex and global world such system thinking is crucial for everyone.

Jim Gee suggests not only to use videogames and simulations in schools and colleges, but also to make learning more *game-like* in the sense of using these principles to design and develop courses and other learning techniques (Gee, 2008; Gee, 2009).

Other scholars who have done interesting contributions to the field are Eric Klopfer and David Williamson Shaffer. Klopfer, Director of the MIT Teacher Education Program, is well known for developing games for mobile platforms, using augmented reality. Maybe the best example is *Environmental Detectives*, a game developed for students of Civil and Environmental Engineering at MIT. Students play in teams, every team has a different role (identity) and a goal: to investigate a serious pollution in Boston Area. But the way students play depends on their role: environmental NGO member, communication officer at the company responsible for the pollution, a scientist at EPA (Environmental Protection Agency), etc. To play the game, students must go out of MIT buildings and visit different places in the Boston Area seeking for data and information. In order to do this, PDAs with a GPS device are available. For instance, if one team is directed to Charles River, when they arrive to the river they have to collect a sample of contaminated water. Here comes augmented reality. When the GPS detects that the team has reached the place where they must get the sample, the augmented reality makes a virtual experience and give the team the resulting data. In fact, teams must collaborate in order to propose a good solution to the pollution problem. Because this game was designed and developed 10 years ago, it has been implemented on PDAs, but today it could be implemented in smartphones and tablets (Klopfer, 2008).

David Williamson Shaffer is interested in the ways we can use V&S to introduce children and young people to the basic conceptual frameworks that govern various professional practices (Shaffer, 2007). Building on the work done by Donald Schön (1983, 1987), Shaffer has developed a set of *epistemic games* aimed at help players learn to *think like* engineers, urban planners, journalists, lawyers, and other innovative professionals. Interestingly, Shaffer states that V&S are powerful tools for reflective learning, statement we share (Vasquez Bronfman, 2008) and that lead us to the following hypothesis related to our research question: V&S are

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the best environments for reflective learning because they create breakdowns ("surprises") very frequently, hence forcing players to reflect on and in action. In this sense, V&S can be referred as *breakdown creation machines*.

Finally, V&S can be linked to the seminal work of Seymour Papert on educational technologies. As a matter of fact, V&S are microworlds. Papert defined a microworld as a "subset of reality or constructed reality whose structure matches that of a cognitive mechanism so as to provide an environment where the latter can operate effectively" (Papert, 1980). Andy diSessa (a Papert pupil) also wrote: "a microworld is a type of computational document aimed at embedding important ideas in a form that students can readily explore. The best microworlds have an easy to understand set of operations that students can use to engage tasks of value to them, and in doing so they come to understand powerful underlying principles. You might come to understand ecology, for example, by building your own little creatures that compete with and are dependent on each other" (diSessa, 2000). The link with V&S is obvious.

An experiment with V&S: The 21st Century Car Challenge

This is a simulation developed by Megalearning, a Brussels-based company[1]. Students are split in "universes" of five teams, of 3 to 5 students each. The role of the students is to be the general management team of a car manufacturer multinational company and their goal is to win the competition against the other teams of their universe. There are four different product lines: Low Cost cars, Family cars, Eco-friendly cars, and Image cars. At the beginning of the simulation, all teams are in the same situation: 20 % of the total market, etc. Teams are evaluated on six criteria that have the same weight: Revenues, EBIT (Earning Before Taxes and Insurance), ROCE (Return On Capital Employed), ARE (Accumulated Retained Earnings), Share Price, and Employee Morale. The simulation calculates all of these indicators.

The first task is to fill a table about customer sensitivities on different purchasing criteria such as design, robustness, technology, size, performance, consumption, advertising, etc. Then students download an Excel sheet where they must make decisions on these criteria for all lines of products. In addition to that they have also to make decisions on price, production capacity, investments in facilities and in Human Resources & Quality, etc. While preparing their decisions the systems give them feedback, so students can see the foreseeable consequences of their decisions (see Figure 1). When the decision is ready, students upload it to the server.

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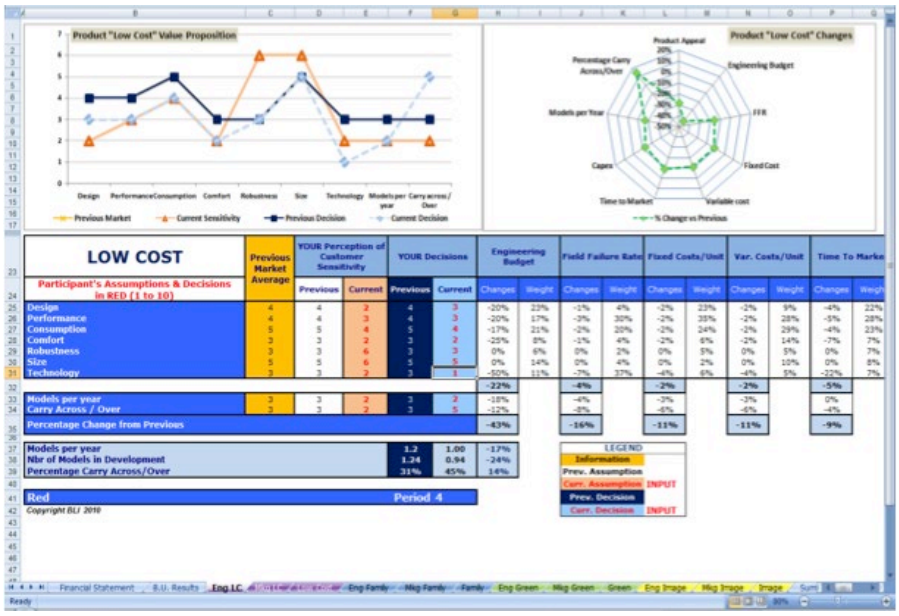

Figure 1. A screenshot of the Excel sheet

Once every team has uploaded its decision, the professor in charge for the universe runs the simulation. The systems give then the results of the first round of the simulation.

At ESCP Europe Business School we have been running this simulation since January 2010, especially for students in our MiM (Master in Management) Program. Every year we have almost 400 students in our Paris campus[2] that we divide in two streams, and in every stream we have 7 or 8 universes. Every universe has a professor who acts as a coach for this universe teams. The simulation lasts for 3 days, where students have to make 7 decision rounds. Professors coach the teams helping them to analyze the results of their decisions and giving them documentation with data on their results and on their competition, which allow teams to build scorecards and analyze their competitors' strategy. As the simulation progress, it becomes more complex. For instance in Day 2 there is a merger with a manufacturer of an emerging country (China, India, Brazil, etc.). Therefore, decisions should be taken for two different markets with different characteristics, production can be outsourced to the emerging country (but this have a negative impact on employee morale), etc.

Based on our main research question (What is the added value of V&S for learning?) we have done an exploratory study using *The 21st Century Car Challenge* as fieldwork for this research. We started this inquiry with the following questions in mind:

- What did students like?
- What did students learn?
- What did students learn better than with other techniques (e.g. case studies, etc.)?
- Did students practice reflection?

At the end of the simulation, all of the students must complete an evaluation questionnaire that gives both quantitative and qualitative data. In addition to that, we could access data by

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doing observation and participant observation[3]. This protocol has been implemented for the two last years.

Clearly, students love to play this simulation/game. What they like most is that "it is close to reality", the experience of doing teamwork, and the competition (they don't play against the machine, they play against other teams). Students learnt to apply general knowledge to particular situations, especially in regard to strategy and competitive advantage analysis, financial statements analysis, marketing mix, operations management, and KPIs (Key Performance Indicators).

What students learnt better than with other techniques? First, the *systemic nature* of companies: there are relationships between financial ratios; there are relationships between functions (the decisions you make when designing a car have an impact on production costs, hence in price, etc.); in other words there are always a multitude of factors to take into account. Second, students experienced the fact that the decision-making process is always done in *uncertainty* ("You can't know what other teams will do", "The situation is changing all the time", etc.). Finally, we observed that students practiced *bricolage*, informed improvisation, trial and error.

Did students practice reflective learning? Our intuition is that V&S allow practicing reflection, in particular *reflection-in-action*, because during the videogame and the simulation, one is always facing surprises, breakdowns, unexpected results… and must to take action, often immediate action. Our findings show that almost all students practiced reflection-*on*-action when discussing the results after a simulation round and when discussing their views during the decision process (because of the system's feedback), but only some students sometimes practiced reflection-*in*-action when preparing their decisions because of the system's feedback, the trial and error process, etc.

Conclusions

The experiment of *The 21st Century Car Challenge* confirms that V&S have at least some of James Paul Gee's learning principles. As a matter of fact, students took an identity (the general management of a car manufacturer company), had a lot of practice making decisions, interacted almost all the time with the simulation, and they have taken risks. Also, students faced well-order problems of increasing complexity and got "just in time" help (delivered mainly by the professors), and learnt system thinking. Finally, performance before competence was the rule.

However, it is important to state the limits of management learning within this simulation. In his book *Managing* (Mintzberg, 2009), the well known management thinker Henry Mintzberg says that there are three levels of management: at a first level people take action; at a second level, managers motivate and organize people to take action; and finally, at a third level, managers take decisions based on data and information. In *The 21st Century Car Challenge*

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students manage only at this third level. This is a key learning point that professors should emphasize: in this simulation, there is no change management.

Finally, concerning our research question, we believe that the added value of V&S for learning can be hypothesized as follows:

- V&S are "breakdown creators", hence forcing players to reflect in and on action;
- In V&S players experiment that decision-making is always at risk, because decision it's done in uncertainty;
- In V&S players experiment the systemic nature of organizations, hence allowing for system thinking.

Last but not least, in all of this learning players have fun (in particular "hard fun").

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[1] There are of course other business simulations products, such as the "Global Management Challenge" from Simuladores e Modelos des Gestao (SDG) in Lisbon (http://www.sdg.pt), CESIM (http://www. cesim.com), a Finland based company, and Industry Player (http://www.industryplayer.com/).
[2] This simulation has also been running in our London, Berlin, and Madrid campuses. Evaluation surveys in these campuses are consistent with our findings at Paris campus.
[3] The author of this paper is also a professor who coaches simulation teams. On the other hand we have hired a researcher and some students doing their MiM Thesis in order to have an external point of view.

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ENHANCING THE LEARNING EXPERIENCE THROUGH VIRTUAL TEAM TEACHING

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Introduction

Early in the 20th century, virtual teams were becoming popular in many organizations. Technology had reached a point where the convergence of communications and computing enabled people around the globe to collaborate and accomplish tasks, without the need for face-to-face interaction. As noted by Almjed, Rybas and Rybas (2013) "this approach has not, however, become commonplace for academia despite that collaboration is nothing new in classrooms and technologies encouraging multimodal communication continue to fill smart classrooms and campus computer labs" (p.1). From observing students working collaboratively online, we know that "collaborative projects are often more time consuming, more challenging, and perhaps more difficult than working alone" (Almjed, Rybas & Rybas, 2013, p.1). This is made more complex due to the lack of personal contact.

Co-teaching within the online classroom could be seen as an opportunity for academia to take a step forward in adopting collaboration in virtual teams. The practice of co-teaching has been shown to improve the student experience, for example, by reaping benefits such as improved learning outcomes and more meaningful relationships between instructors and students (Fuller & Bail, 2011). We also know that co-teaching can add value to the instructional experience, as it gives instructors the opportunity to learn from each other's knowledge, experiences and teaching approaches. For these and other reasons, co-teaching has been incorporated during the last decade within the Master of Distance Education and E-Learning (MDE) program. To assess the value and the effectiveness of this practice within the online classroom, the MDE program directors chose to undertake a review of co-teaching from the instructor perspective. Initial results of the review are presented in this paper.

Context

The MDE program is a joint initiative between Oldenburg University in Germany and the University of Maryland University College (UMUC) in the United States. The online graduate program is led by two program managers (also referenced here as program directors), one at each institution, who are the single full-time staff involved in the program. All other MDE faculty are categorized as adjuncts, and receive unique contracts per semester per course for

their teaching activities. The partner institutions manage their faculty pool independently, and are exclusively responsible for a subset of courses offered in the program. Most of the faculty members are working for one of the partners; however, there are a few who have taught with separate contracts for both institutions, while teaching distinct courses. Faculty members live in a variety of locations around the globe, including several states in the US, Germany, Canada, Australia, the United Kingdom, and Israel. The distinct nature of the MDE faculty body adds to the complexity of managing the program, while contributing to rich diversity. These aspects are not only relevant to our study, but also what makes the discussion of the co-teaching topic that much attractive and significant.

Literature review

Co-teaching is often used synonymously with terms such as team teaching and collaborative teaching. Cook & Friend (1995) define co-teaching as "...two or more professionals delivering substantive instruction to a diverse, or blended group of students in a single physical space" (as cited in Scribner-MacLean & Miller, 2011, para. 9). Scribner-MacLean & Miller (2011) adapt this definition further for online learning by describing the educational environment not as a physical place, but "a single *learning* space" (para. 9). Fuller & Bail (2011) describe the co-teaching experience as one where there is "...an equal partnership and expectation to contribute substantive material to maintain the integrity of an online course" and not a situation where labour is simply divided, but rather "a synergistic effect and expectation of mutual engagement to provide greater clarity and interaction with students" (p. 73). Models of co-teaching described by Cook & Friend (1995) include (Table 1).

Table 1: Co-Teaching Models (Cook & Friend, 1995)

Model	**Description**
Teacher - Assistant Teaching	One educator is designated as the leader, whereas the other observes the classroom environment in order to identify student needs and provide support as necessary (para. 32).
Station Teaching	Instructional content is split into separate parts and then distributed amongst the educators, who "present the content at separate locations within the classroom" as students move from station to station, with no interaction among educators (para. 34).
Parallel Teaching	Instruction is planned jointly, and educators deliver the same content, but each to half of the class (para. 36).
Alternative Teaching	One educator instructs a larger group of students, while the other instructs a smaller group (para. 38).
Team Teaching	Educators jointly plan and present instruction, shifting responsibilities in delivering instruction, leading discussions, and demonstrating training concepts in a synergistic way (para. 41). Instructors share the tasks of planning, teaching, and assessment, although some tasks may be completed separately (Villa, n.d.; Bautel-Williams, Evans & Metcalf, 2010).

With these definitions in mind, the prevalent model applied within the MDE is the team teaching model; future references to co-teaching are equivalent to team teaching.

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Benefits of co-teaching

The rationale for using co-teaching in the online environment is similar to a face-to-face classroom, but at the same time can have different results in terms of the student experience. Research on co-teaching within online learning has shown that co-teaching helps in increasing student engagement, building a greater sense of community, and providing students with an overall positive learning experience (Scribner-MacLean & Miller, 2011; Bautel-Williams, Evans & Metcalf, 2010). Students have also gained different perspectives on a topic and received more in-depth and quicker feedback, as well as assessment feedback that offers different perspectives and diverse knowledge resources (Scribner-MacLean & Miller, 2011; Bautel-Williams, Evans & Metcalf, 2010; Fuller & Bail, 2011; Lewis & Sincan, 2009). In addition, the co-teaching approach in the online learning environment can help create a synergy of pedagogy and presentation, giving students a sense of increased instructor presence and access to the instructor (Fuller & Bail, 2011).

Online co-teaching also offers certain benefits to the instructor, such as increased flexibility and a shared workload, for example, in scheduling course activities, facilitating classroom discussions, working through technology issues, and sharing resources such as course materials, best practices, experiences, and expertise (Scribner-MacLean & Miller, 2011; Bautel-Williams, Evans & Metcalf, 2010; Fuller & Bail, 2011). Haladay (2012) reports on the co-teaching experience as one that supports reflection and is energizing during the highs and supportive (tag-teaming) during the lows, making "it much easier to dive back into the fray and keep innovating" (para. 20). Within the classroom, Fuller & Bail (2011) also found that the team teaching experience resulted in an enhanced and stronger course design, as the co-teaching experience caused them to challenge each other's perspectives and to adapt and improve. Scribner-MacLean and Miller (2011) and Bautel-Williams, Evans and Metcalf (2010) agree that co-teaching online can provide a more satisfying experience for instructors and help decrease the sense of isolation that can occur when teaching alone. Co-teaching also provides an opportunity for professional development, as well as growth and mutual learning, and can promote stronger faculty relationships that are based on shared vision and trust (Bautel-Williams, Evans & Metcalf, 2010; Fuller & Bail, 2011; Lewis & Sincan, 2009).

Drawbacks

The online co-teaching experience can also have its drawbacks, for example, two different instructors can have very different teaching approaches, as well as differences of opinion, which can then lead to miscommunication and confusion (Wiesenberg & Massey-Hicks, 2005, p.6). Different assessment approaches can also result in imbalanced grading, with one instructor grading "tougher" than the other (Bautel-Williams, Evans & Metcalf, 2010). For instructors, co-teaching online can be labour-intensive as well as challenging in finding an equal balance in sharing the workload (Scribner-MacLean & Miller, 2011), as well as in coordinating schedules to find time to meet (Bautel-Williams, Evans & Metcalf, 2010; Lewis & Sincan, 2009). Cultural differences that impact teaching approach can also play a role. For example, in their case study on co-teaching, Lewis and Sincan (2009) found one instructor to

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be "overly cautious providing feedback to students due to concern for respect and personal sensitivity, which are rooted in culturally-based norms and practices" (p.40).

Methodology

The practice of co-teaching online has taken place in the MDE program for more than 10 years. Initially, only a few courses implemented co-teaching, but over the last three years, co-teaching has become more frequent. In the last year, 43 % of all MDE classes were taught through co-teaching arrangements. Of the fifteen distinct courses in the program, only six have never been co-taught. There are instructors who have never experienced co-teaching, while other instructors in the program have always co-taught (and never taught alone) in any course in the program. A larger proportion of females co-teach as compared to male instructors (100 % of females have co-taught at least once, while 70 % of males have co-taught once). In some of the cases, the courses that have never been co-taught have just one single instructor within the program who has specific expertise in the subject matter. Since courses were not developed with a co-teaching scheme in mind, instructors need to decide on a co-teaching model and discuss how courses will be delivered, as well as their individual preferences in such arrangements.

To better understand the co-teaching practice and experience within the MDE, the program directors developed a survey for instructors and teaching assistants (TAs) that gathered data about their perceptions and experiences concerning co-teaching. Results of this survey (presented in the Analysis section) showed that there are different reasons why co-teaching has been adopted within the MDE, such as:

- Instructors want to work more closely together with other peers;
- The program directors want to involve a larger number of faculty in the program and expand MDE teaching opportunities by creating a faculty pool, and co-teaching is a way to achieve this goal; and
- There is a program need for preparing/mentoring new faculty starting in the program.

The first phase of the research was based on a survey, which asked faculty to rate their co-teaching experiences based on a 1-5 Likert scale, which is exemplified in Table 2.

Table 2: One sample of Co-teaching Survey Statements

Statement	Description
1	Most of my experiences with co-teaching were positive.
2	Co-teaching has enhanced my teaching effectiveness.
3	Co-teaching has expanded my teaching practices.
4	Co-teaching has expanded my knowledge of the subject matter.
5	Co-teaching has made teaching more efficient.

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Faculty were also given an opportunity to expand further on the ratings that they provided. In addition, faculty were asked to rank the importance of factors that influenced co-teaching such as leadership support, administrative support, instructional support, common teaching styles, synchronous and asynchronous communication between co-instructors, use of collaborative technology, clear plan for workload sharing, and complementary skills of co-instructors. The second phase of the research, which is currently being undertaken, has been designed to include focus groups with faculty and students, as well as surveying students about their impressions concerning co-teaching. The study of this topic has also revealed that trust is at the core of many of the identified issues (as discussed later) and is an aspect that will permeate the continuation of the research work.

Findings

The faculty survey generated a rich selection of extended answers, many of them detailed narratives of faculty experiences, issues, and recommendations for improvement. Responses were organized according to the following categories: benefits, challenges, and strategies. These were further categorized in terms of their applicability to faculty, students, and administrators.

On average, most instructors (60 %) had two to four co-teaching experiences, with two instructors having no co-teaching experience. Ranking of factors according to importance showed that a clear workload plan is the most important factor to successful co-teaching, with leadership support coming in as a close second. Use of collaborative technology was generally viewed as the least important factor in influencing co-teaching success. Faculty opinions about co-teaching varied, with some faculty viewing co-teaching strictly as a division of responsibilities and labour, and others considering it to be much more collaborative. For example, one MDE instructor said:

> *Co-teaching is not simply about dividing the grading and responses in the conferences. It's got to be synergistic and provide a good learning experience for students. (MDE instructor, 2012)*

Benefits for faculty

The literature already contains some experiences that point to the richness of co-teaching, such as the ability of co-instructors to visit each other's course(s) (Scribner-MacLean & Miller, 2011). MDE faculty also identified clear benefits from co-teaching. The majority of instructors reported the experience as enjoyable and effective, promoting collegiality, providing them with an opportunity to meet other faculty and for broadening their views about teaching online. Interactions with a co-instructor was found to expand professional expertise; one instructor is able to experience the other instructor's exchanges with students and is exposed to new views of the subject matter, thus expanding his/her existing knowledge. As one instructor described it,

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> *"...every time I [co-]teach I expand my knowledge of my subject matter. There is always something to learn, especially in the area of technology! ...It [co-teaching] has definitely pushed me to broaden the way I look at teaching and the way I conduct my class." (MDE instructor, 2012).*

As would be expected, faculty appreciated the ability to share the course workload. These faculty members for the most part are professionals in distance learning and have other commitments; teaching in the MDE is not their primary occupation. Co-teaching allows them to retain contact with the program, and continue to teach, without adding an unmanageable surplus of work to their schedule. Depending on the model that is adopted, there might be a week during which the instructor would have a lighter load, and therefore be able to more easily manage his or her duties. Having a co-instructor also provided extra flexibility. For example, when travel was part of the schedule, instructors would plan their sharing of class duties around these commitments. This was also true in cases of emergency, family matters or illness. It was also reported that working in a team helped instructors to keep on top of classroom issues at all times.

Benefits for students

Although students have not yet been directly surveyed about co-teaching arrangements, certain benefits for students were identified in course evaluations, anecdotal feedback, and instructor responses to the survey. Through co-teaching, students have received two different perspectives from experts in the field, which in many cases are complementary or are enriched by extra input. With two instructors there was a more balanced and diverse set of responses and feedback. The teamwork of co-instructors has also served as an example to students, who are challenged to work in teams at a distance as part of the requirements of many of the courses in the program.

Benefits for administrators

From the perspective of administrators, co-teaching is an excellent venue to prepare faculty for online teaching in a participatory fashion. Faculty receive institutional training before teaching online, but working in a team adds an actual experience where expectations, guidelines, and mode of operation are shared. Experienced instructors are able to provide practical mentoring by working together with new faculty members. Administrators of adjunct faculty are frequently in difficult situations when unexpected events might prevent an instructor from teaching a certain class. Through co-teaching, a pool of faculty can be created from which to draw when such situations arise. From a program perspective, co-teaching stimulates collaboration, thus enriching the program; a sense of belonging is nurtured, which is essential in an environment of adjunct faculty at a distance. Having two people work together to find common ground and consistency when delivering an online class also promotes the consistency of the course as whole, moving away from courses that are highly personalized to an individual's preferences. It is also easier to ensure that course objectives are met with this process. Collaboration among instructors has also expanded outside the

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classroom as the result of co-teaching, with co-instructors going on to work on other projects, specifically research in distance and e-learning.

Challenges/Drawbacks

The survey was also able to expose challenges in our co-teaching experience. Instructor compatibility was identified as an area that can be challenging, as different teaching approaches can applied, and instructors found it necessary to discuss and find resolution on compatibility issues. Balancing workload was also a crucial issue and was instrumental in influencing the instructor's decision to participate in co-teaching. Co-teaching also requires spending additional time negotiating tasks, grading, and course management, thus adding to the overall instructor workload. The balancing act continues throughout the class, and instructors found that they needed to review expectations regularly and make adjustments as needed.

It was clear from the feedback, that instructors expected co-teaching guidelines from administration. One instructor found that a lack of clear co-teaching models and strategies led to confusion amongst faculty about co-teaching, saying

> *"Challenges have been about the lack of leadership and guidelines as to who does what; interpretations of what co-teaching means; dividing the assignments to provide the best learning experience for students." (MDE instructor, 2012)*

Strategies and recommendations

Survey findings contained a significant number of suggested strategies and recommendations. The managers of the program, who also co-teach in the program in a faculty role, have also amassed strategies from their own experiences. The following strategies and recommendations draw from these co-teaching experiences and have been categorized into distinct categories.

Communication

Communication needs to be effective: clear, open, positive, often, and ongoing (Scribner-MacLean & Miller, 2011; Fuller & Bail, 2011; Lewis & Sincan, 2009). As in any project, working with someone closely is better accomplished when there is compatibility between participants, and instructor compatibility should be considered in co-teaching arrangements. As a starting point, it is helpful to pair instructors who have common teaching philosophies. However, depending on personalities, instructors with different philosophies might be open to share and understand distinct philosophies and be able to negotiate the differences. As one MDE instructor put it,

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> *"…it is essential that options and parameters are discussed and that one also knows or aims to understand the teaching philosophy and approaches and handling of difficult situations and/or learners."*

Instructors working together should work toward creating a supportive, reflective environment for exchanges, one that encourages mutual trust, openness, and fairness. Also, by encouraging instructors to establish a relationship between each other prior to the teaching assignment, participants have the time to develop the closeness needed to support successful collaboration. Co-teaching is a shared endeavour, and it should be clear that when there is ambiguity and differences, these can best be resolved through open and immediate communication.

Prepare in advance

Advance planning and preparation before the teaching assignment occurs is key. During these planning sessions, course goals, content, and approach should be discussed and clarified (Bautel-Williams, Evans & Metcalf, 2010). To successfully do this, co-instructors should have a good understanding of course structure and content, which can be achieved by reviewing course documents, the schedule, details of assignments, rubrics, and assessment criteria. To promote consistency and ensure a positive learning experience for students, faculty should discuss these documents and clarify expectations about the teaching model, the workload for each instructor, and the pattern of interaction with students (Lewis & Sincan, 2009). This advance preparation should be guided by program administration, supplemented with directives, checklists, and reminders.

Even when everything is well planned, differences might eventually creep into the partnership, and faculty should also have an established plan for managing Murphy's Law and other unanticipated bumps in the road (Scribner-MacLean & Miller, 2011). Wiesenberg and Massey-Hicks (2005) find that "To be successful, co-teaching requires that the instructors plan carefully, communicate constantly, and be responsive to the inevitable unforeseen issues that arise" (p. 6). Thus, it is essential that co-instructors be open and ready to deal with differences, which might include their own teaching philosophy, thus requiring some compromise. Co-instructors need to negotiate common ground, since conflict and inconsistency have the potential to discourage and confuse students.

Workload and consistency

Specific guidelines related to workload and ensuring consistency in the class should be established. Since co-teaching is a sharing model, it is essential that faculty perceive that they are carrying a smaller workload than if they were teaching a course alone. Given that collaboration may require additional communication and coordination, it is expected that the load for each instructor will count for little more than half the usual teaching workload. Both parties need to ensure that this is achieved in order to avoid possible frustration and resentment. Different models for sharing the workload can be used, and these may be more or

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less appropriate depending on the course and on instructor preferences. The workload aspect is probably the most important one, since it includes defining the co-teaching model, roles and functions to be performed by each instructor. Even when the model calls for a shared presence in the classroom, for consistency purposes, make sure that none of the faculty members is away from class for too long. Faculty should decide how classroom presence will be handled so that students are not confronted with a class where interaction with the faculty member changes abruptly throughout the course. Students need to perceive that co-teaching is taking place throughout the entire course.

Communication with students through conferences or in private needs to be consistent, so faculty should discuss a common protocol and to keep the other instructor informed about special requests or situations happening outside the of the virtual environment. Scribner-MacLean & Miller (2011) encourage co-teaching faculty to "speak with one voice" and to have students e-mail both instructors on all correspondence (para. 21). Fuller & Bail (2011) further advise co-instructors to share all communications with students with each other, and if there is disagreement on a response, then to discuss this with each other before writing to student.

Another important area where consistency is critical is within the assessment process. Clear guidelines on how work will be assessed need to be established to ensure fair assessment of student submissions (Scribner-MacLean & Miller, 2011). Instructors should ensure that they understand and agree on assessment criteria, as well as develop detailed rubrics that help guarantee consistency in grading and on level of assignment feedback.

Administration and support

We have learned through our survey and experience that administration and support of faculty also play an important role in making co-teaching more successful. Leadership needs to clearly define goals and expectations, as well as provide a basic framework for how instructors should work together and what they need to consider as they move forward. The program administrator should also support instructors and the co-teaching approach, as well as

> *"discuss with the participant faculty what model of co-teaching it expects. That may determine the amount of work and effort that each faculty member contributes to the overall process" (MDE instructor, 2012).*

Administrators can also profit from using co-teaching models. For example, co-teaching is an appropriate framework for mentoring new faculty, achieved by pairing them with more seasoned faculty. Another approach, used by Lewis & Sincan (2009), was to pair an instructor who was a content expert with an instructor who was an expert in online pedagogy and tools, thus allowing instructors to approach their preparation and delivery of instruction in a balanced way and with both learning from the other.

Co-teaching can help build community, especially important in environments where most faculty are part-time adjuncts, such as in the MDE. The administrator can further support co-

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teaching through synchronous meetings and by setting guidelines and recommendations. The program manager should ensure that instructors are equally committed, are open to trying new ways of collaboration and cooperation, and that they clearly understand the requirements of the co-teaching agreement.. Providing support to instructors is also key and can be achieved by employing teaching assistants, who work with both instructors and who take on a participatory role in the course management. Also, any issues regarding compensation should also be addressed before implementing a co-teaching solution

Role and importance of trust

As we delved into an analysis of our results and personal experiences, it became evident that many of the identified challenges and strategies speak closely to the concept of trust. Trust, honesty, and mutual respect are essential to a successful team teaching experience (Fuller & Bail, 2011; Lewis & Sincan, 2009). Jarvenpaa, Knoll, and Leidner (1998) point out that "trust is critical in new organizational arrangements where the traditional social controls based on authority give way to self-direction and self-control" (p.30). The authors define a global virtual team as an example of such new organization, "where a temporary team is assembled on an as-needed basis for the duration of a task, and staffed by members from far corners of the world" (p.30), interacting primarily through ICTs – a description that aligns closely to the online co-teaching models and practices described in this paper. Trust within the online environment becomes pivotal "in preventing geographical distance from leading to psychological distance in a global team" (p.30), with technology serving as the necessary medium for interaction and collaboration. However, technology is not the glue that creates a common workplace, and trust is at the core of the relationships that are conducive to successful collaboration. An important differentiator of our context from that reported on global virtual teams in the literature is that instructors frequently establish a continuous relationship with a few other instructors through renewed co-teaching agreements.

The literature also identifies three important antecedents of trust, namely ability, benevolence, and integrity. Ability is defined by the skills that enable someone to be seen as competent and therefore trustworthy. Benevolence is the perception of one's care or concern, which then inspires trust in others. And finally, integrity refers to habits and behaviours that demonstrate that one is dependable and reliable. In early stages of relationship development, integrity is a strong predictor of trust, while ability tends to diminish its influence over time and benevolence takes longer to develop. Reference to these specific aspects has not been part of our research methodology thus far. However, as we connect our results with the existing studies on trust from the literature, it is clear that the role of trust is a highly, if not the most, interesting aspect to be analyzed as we continue to pursue the research on online team teaching.

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Conclusion

Our study of co-teaching within the MDE has established that there are specific scenarios where co-teaching online is a beneficial choice, particularly in cases where new faculty (either new to the content, the program, or to online teaching) are being on-boarded. By pairing a new faculty member with a more experienced peer, the transition into the course or program can be managed more smoothly and with the right practices in place. Co-teaching is also extremely beneficial when instructors have complementary knowledge and experience of the subject matter, as both can bring diversity to the students' learning experience. Finally, in situations where instructors have an established relationship, co-teaching brings yet another layer to that relationship, often making the co-teaching experience a deeper and more joyful one and one that can lead to further professional collaboration.

We also recognize the impact of leadership in the success of co-teaching experiences, and it is our goal to further explore how strategies discussed here can be reinforced through the actions of program managers, whether through tactics used to prepare for co-teaching, to support staff, and to better select faculty for co-teaching teams. Our results have revealed significant communication gaps between faculty and MDE leadership regarding co-teaching. Leadership had in principle relied on relationships developing more organically and had avoided intrusion into established agreements between faculties. Given the nature of academic work and the traditions of university work, this motivation should not be dismissed. However, managers should provide guidance, suggest models, make resources available, and work toward enhancing the support framework. Basic administrative issues, such as compensation and functional expectations, should also be discussed openly and upfront.

Finally, the study has established that the role and importance of trust is fundamental to any co-teaching endeavour. The role of trust in the early, developmental stages of new partnerships is an area for further exploration and research, as the co-teacher relationship is a significant determinant of successful team teaching, independently of course at hand. At this stage of our study we are able to summarize our major findings as follows: leadership and management matter; teaching models and strategies need prior agreement and preparation; support at all levels for co-teaching is critical; benefits can often outweigh challenges, but not always, and individual personalities can also play a role in successful collaborations.

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ALIGNING ONLINE DISCUSSIONS WITH BLOOM'S CRITERIA FOR HIGHER ORDER THINKING

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The Problem

The importance of class discussion dates back as far as Kolb's study in 1984 (Andresen, 2009) when the process was identified as critically important to learning. They are used to achievement of online course objectives (Du, Yu & Olinzock, 2011). According to Webb, Jones, Barker and van Schaik (2004) student achievement of learning outcomes was significantly related to student participation in discussions via original discussion question submittals and replies. Higher levels of substantive participation correlated to higher grades on course exams.

This approach assumes that students have the skills and culture needed to engage in critical thinking discussions (sometimes called arguments or debates). However, some studies have shown that students are not always effective at engaging in critical discussions (Strang, 2010 and Levy & Ellis, 2006). This may happen more often within institutions that grant access to students who are embarking on a programme of studies without a prior basis in critical thinking. Land (2000) found that enrolled students are often limited in prior subject matter coverage. Such students might face difficulties in efficiently and effectively commenting on each other's ideas and thoughts. Other students may have been culturally inculcated not to question tutors or authors as a sign of respect. They may hesitate to challenge what an author has put forward (Lai, 2006). Additionally, faculty might face challenges engaging students in higher order critical thinking for their own educational and cultural reasons. Facilitators may be subject matter experts but not critical thinking experts.

The Study

Strang (2011) hypothesised that 'teacher-driven Socratic questions (to rouse critical thinking conversations) will be more effective than facilitating traditional student-student discussion forum interaction', it was found that there were more interactions among students and mean grade scored was also higher. If a question asks who, what, when or where the student can quite simply find and report the answer. The student demonstrates research skills but no other thinking skills. Depending upon the method of presenting this unoriginal information the content will be measured as Bloom's Higher Order Thinking (HOTs) level 1 through 3 (Ward, 2010).

Critical thinking happens when some form of 'why' is asked. Winsted (2009) suggests that creating a debate environment for the classroom discussions increases student engagement and stimulates critical thinking. Cooley (2009) also creates a form of a debate for her course. She notes that it is important to have such discussions because "Business students benefit from as much exposure to best communication practices as possible" (p.437). The types of discussions and the facilitative support for accomplishing the discussions both contribute to the success. Ward (2010) addresses the use of Bloom's HOTS. In a study of 661 questions only 3 % were higher order thinking as asking for evaluation. None asked for analysis or synthesis. In performing a content analysis of an accounting/operations management course this study found that lower order questions produced lower order answers. However, higher order questions frequently resulted in lower order answers, too.

The Solution

It was determined that in addition to asking questions designed to produce Bloom's HOTs answers, that students needed in-classroom tutorials, trainings and rubrics to facilitate and encourage the submittal of Bloom's HOTs essay. A Delphi Panel was formed to develop guidelines customisable to each course which would provide ongoing training to students and faculty in the art and skill of engaging in Bloom's HOTs discussions. A pilot course using the Delphi Panel's materials resulted in significantly increased use of Bloom's HOTs levels 4 through 6. The presentation will provide some information on the results of the content analysis. The focus of this presentation is the use of the Delphi Panel in the development of the Discussion Activities Guidelines.

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"THE I IN WIKIS" – EXAMINING HOW CREATIVITY, COHESION AND WELL-BEING ARE EXPRESSED IN STUDENT COLLABORATIVE PROJECTS

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Abstract

This paper sets out to compare the different approaches to a wiki assignment between Irish undergraduate and postgraduate psychology students. The differences in the expression of creativity in the wikis will be addressed with examples of creative elements from both undergraduates and postgraduate wikis showcased. The differential use of icebreakers in establishing cohesion and setting the scene for a good motivational climate is also highlighted. The importance of establishing group cohesion through these activities and through critical reflection and communication to the well being and functioning of online learning groups will be established from the use of feedback from the student reflections which are submitted at the end of the assignment. Suggestions on future research in terms of online learning group dynamics and creativity will be presented.

Introduction

This paper will present an overview of the use of wikis as a pedagogical tool in both an undergraduate psychology course and a postgraduate psychology course. It will introduce the concepts of creativity and cohesion and explain the psychological context of how these affect student learning in these online learning groups and their participation in the wiki assignment. It sets out to compare the different approaches that the students use when developing their wikis in terms of group behaviour and creativity. The different strategies used by undergraduates and post graduates in tackling the same issues will be demonstrated in the paper. It also sets out to discuss how the wiki assignment can facilitate creativity and well being in students. Reflections and feedback from questionnaires that the students completed when evaluating the assignment will also be presented and discussed in the presentation to support the importance of group cohesion to both creativity and motivation in online learning groups. Observations and evaluations from running this online learning group assignment will be used to suggest directions for future research in the presentation.

Wikis as Pedagogical Tools in Education

The first Wiki was designed by Ward Cunningham in 1995 as a tool that would encourage people to publish (Richardson, 2006). Wikis, from the Hawaiian word meaning 'quick' as the owner usually allows the content of at least one page to be quickly altered so that a shared document is created. A Wiki is a powerful tool for constructivist learning environments because it facilitates collaboration (Notari, 2006). Wikis are perceived to be true tools of social constructivism

The Wiki Assignment in the Psychology Programs

For the past number of years both the masters in cyberpsychology and the second year applied psychology students have been assigned a wiki to design. The second years focus on developing informational wikis on personality psychologists, while the postgraduates develop a wiki on any topic relating to cyberpsychology. This has always been an assignment that generates resistance and reflection. The assignment starts with icebreakers in terms of a paper wiki on any fun topic. Then moves to evaluation software, picking a topic and then designing the wiki, testing and evaluating it. All students write a reflective report detailing their experiences in terms of the learning and of the group dynamics. Students can also fill out some positive psychology questionnaires in terms of well being and satisfaction with life when the project is completed. The assignment runs from November to March for the undergraduates and until February for the postgraduates.

Creativity

It has been held that the basis for creativity is held to lie in the generation of high-quality, original, and elegant solutions to complex, novel, ill defined problems. Originally, Psychologists and Educators believed that creativity depends on special qualities of unusual persons (Amabile & Pillemer, 2012).

Recently it has been considered that creativity was not a fixed, trait-like quality of individuals but, rather, a skill that might be taught, learned, practiced, and improved (Amabile & Pillemer, 2012). Osborn (1963) asserted that the generation of creative ideas by groups could be enhanced by following his four basic brainstorming rules –the most important of which is deferring judgment. These techniques in brainstorming have been widely used and taught as methods for enhancing creativity in groups.

Mumford's Model of Creativity

One of the most widely used models in educational programs is Mumford's model of creativity. Mumford et al.'s (2001) model is based on three critical propositions.

First, creative problem-solving, like other forms of problem-solving, must be based on knowledge and information – bearing in mind the point that knowledge provides a basis for

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interpreting information. Second, it is held that one could not generate new ideas solely on the basis of extant knowledge. Rather, this knowledge must be recombined and reorganized to produce the new knowledge that allows for the generation of novel ideas Students must move out of their comfort zones in processing that information and extend the boundaries and possibilities of how that information can be used. Students must get past the functional fixedness that culture may have instilled into them.

Third, ideas must be evaluated and shaped into viable plans for directing work on a creative project (Mumford, Schultz & Van Dorn, 2001) – often work which precedes over a period of years. The application of this model takes place in a number of steps (e.g. Osburn & Mumford, 2006):

1. problem construction;
2. information gathering;
3. information organization;
4. idea generation;
5. idea evaluation;
6. implementation planning.

It has been found through reflection and observation that the different age cohorts of students move through these stages at a different pace. The undergraduates accelerate through stages 1, 3 and 5 and linger at stages 2 and 4 and 6. Undergraduates focus on the content and thus information gathering while postgraduates spend more time in gelling the information from all members and sources and evaluation in terms of critical discussion.

Motivation and Creativity

One of the main theories in the social psychology of creativity is the Intrinsic Motivation Hypothesis of Creativity. (Amabile, 1983), this theory proposes that "The intrinsically motivated state is conducive to creativity, whereas the extrinsically motivated state is detrimental". Intrinsic motivation arises from the individual's perceived value of engaging in the task itself (e.g., finding it interesting, enjoyable, satisfying, or positively challenging), while extrinsic motivation comes from outside sources (e.g., the promise of rewards or praise, or the threat of failing to meet a deadline or receiving a negative evaluation). In short, extrinsic motivators and extrinsic constraints in the social environment could alter motivational state from intrinsic to extrinsic and, thus, undermine creative behaviour. In summary, the main motivator to creativity is the sense of challenge, fun and achievement that the student obtains from the task and that opportunities for these need to be built in to the activity or assignment. The benefits to the students of these activities can be highlighted in Figure 1. Positive educational psychologists have long known the importance of task/activity design to the subjective well being of students. The challenge of the wiki in terms of the group dynamics and the sense of ownership that the project instils can enhance eudemonic well being. The autonomy that the wiki assignment gives the student groups to design and build their own

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resource also facilitates this. The students attempt to fill their wikis with original yet relevant features can be seen as an expression of their creativity. There is a noticeable difference in approach between the undergraduates and postgraduates wikis in this area. Undergraduates wikis seem to have loads of YouTube clips and slide shows, they focus on visual features while postgraduate wikis tend to be more interactive in terms of polls, games and quizzes. The rewards too vary with undergraduate reflections citing hedonic rewards like fun while postgraduate ones focus on sense of achievement. The addition of complex interactive creative feature like games, quizzes and crosswords by the postgraduates was interesting considering the debate in education about the effects of games on students. Positive effects include games increase motivation; engage players with learning; and support collaboration, communication, thinking and ICT (information and communication technology) skills. They also improve computer skills, problem-solving skills, and subject knowledge (Baek, 2008). There is still considerable resistance to using games in education as Kirriemuir and McFarlane (2003) summarize that the frequently mentioned obstacles: the limited time span of individual classes, verification of gaming effectiveness in the classroom, insufficient support materials, licensing agreements, budget constraints, and lack of time for both teachers and students to familiarize themselves with a game. To the students these seemed like natural or obvious methods to enhance engagement as well as the pleasure of doing the activity. It can suggest that students have insight into what motivates their peers and what will make learning more fun.

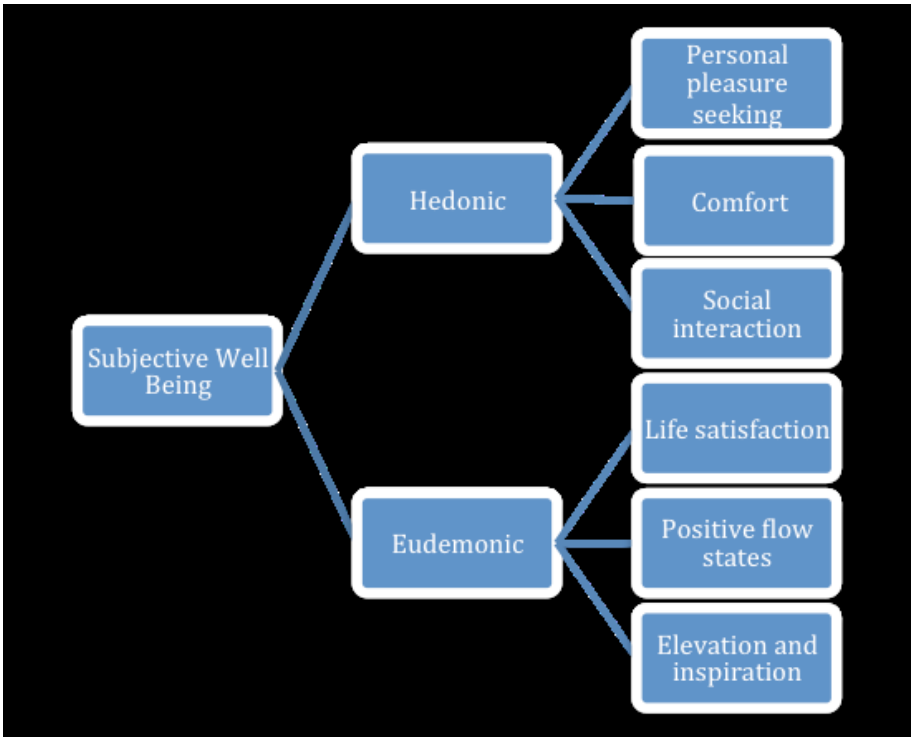

Figure 1. Hedonic and Eudemonic Subjective Well-Being (Ryan & Deci, 2001)

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Motivation and Group Climate

The need to invest cognitive resources in creative thought not only suggests that motivation will contribute to creative problem-solving but also suggests that people will make a conscious decision as to when, or when not, to make this investment. One model of creative thinking suggests that creative work, and creative people, will be environmentally sensitive. Hunter, Bedell and Mumford (2007) conducted a meta-analysis of prior studies examining the effects of climate perceptions on creative achievement and creative problem-solving. Their findings indicated that climate perceptions had strong effects on creative achievement and creative problem-solving. It has also been found that leadership behaviour can also influence creative thinking in groups. This study established a link between cohesion in terms of group climate and creativity.

Autonomy, Group Dynamics and Creativity

Zhou (2003) integrated theories on intrinsic motivation and observational learning to examine how creative models and supervisory behaviour influence employee creativity. The study focused primarily on two supervisor behaviours: close monitoring (hypothesized to decrease intrinsic motivation and, thus, creativity) and developmental feedback (hypothesized to increase intrinsic motivation and creativity). The effects of having creative coworkers (models) on worker performance were also examined. It was found that participants with less creative personalities exhibited higher levels of creativity under low close monitoring and the presence of creative co-workers. The wiki as an assignment develops positive group climate with a minimal of supervision. The group organise and manage the project with the lecturer acting as a guide or facilitator. The groups organise group roles and group rules which regulate the behaviour of members. Communication for the undergraduates focus on a mixture of face to face team meetings and online interactions while the postgraduates use mainly only online interactions. Each group is mixed with members from different streams of psychology which enhances the diversity and creativity of the group. The postgraduate groups are even more diverse with students from different backgrounds , social class, technology experience and occupations forming groups. This may explain the added creative features that distinguishes the postgraduate wikis from the undergraduate wikis. Grant and Berry (2011) found that other-focused psychological processes – pro-social motivation and perspective-taking – strengthen the relationship between intrinsic motivation and creativity in organizational settings. These are traits that develop with time and cognitive maturity and could explain the focus on eudemonic well being that emerges in the postgraduate reflections.

Cohesion and Creativity

Taggar (2002) examined evidence of "team creativity-relevant processes": a group's ability to work together (cohesion) effectively and make the most of each member's skill set and how they may impact on creativity. It was found that these group processes moderated the relationship between individual creativity and group creative output. Recent research has shown what happens in the first few minutes of a team's life can profoundly affect creativity

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on team projects (Polzer, Milton & Swann, 2002). Specifically, if the members of the team become acquainted by sharing their views of themselves during their initial meeting – through a process termed interpersonal congruence – the team is likely to receive higher creativity scores on its projects. It has been noticed that the undergraduate groups spend more time initially on icebreakers and getting to know you information sharing activities in the first meeting. The wiki assignment does have a paper wiki activity on a fun topic to start the project for both undergraduates and postgraduates and it is the cohesion and team dynamics on this initial section of the assignment which determines the atmosphere of the reminder of the project Reflections on the wiki project from both student groups focus on this initial section which does support the research findings. The differences between online learning groups and off line learning groups in the use of icebreakers to establish trust and cohesion are notable in the wiki project. It has been shown that pure online groups do not use any icebreakers and work off of "swift trust" while online groups do rely on methods such as icebreakers to establish trust and establish a good group climate. This study was a mix of online and offline as the first session (paper wiki) was a face to face for both groups and then moved strictly online. The differential use of this icebreaker and its perceived use to the learning of the group members was commented on in the reflections from the students. These differences and how they impacted upon the learning between the groups is interest.

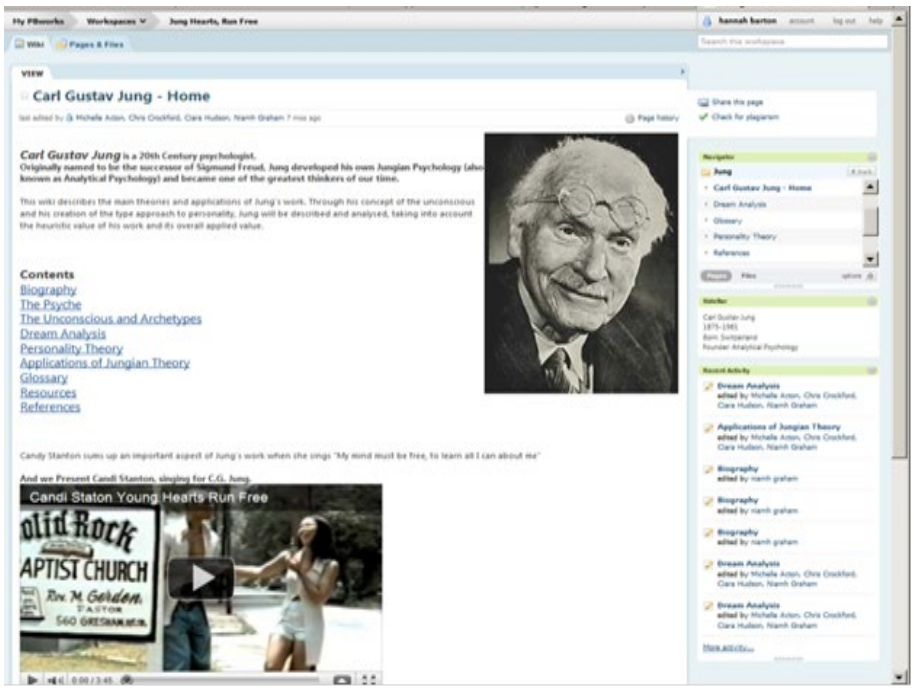

Figure 2.

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Conclusion

This paper sets out to compare the wikis produced by undergraduates and postgraduates in terms of how they approached the task in terms of creativity. It also looked at the theoretical models which underpin the study of creativity and which give an explanation for the experiences and reflections of the students. The impact of the group climate was also discussed with reference to how it affects creativity by the group. The importance of group dynamics especially online groups can impact on creativity through the mediator of group climate and cohesion. Some observations from this project giving ideas for future research will be discussed in the presentation especially with regards to establishing group cohesion through ice breaker activities. The presentation will present screen shots of the wikis highlighting the points made in the paper as well as a more detailed examination of the feedback from the students.

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ONLINE COOPERATIVE WRITING AS CRITICAL THINKING ENHANCER – AN EXPERIMENTAL EXPERIENCE

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Cooperative learning as an added value of knowledge processes

In a rapidly changing environment, success of structured organizations and, consequently, of people involved, depends on the ability to continuously self-reinvent for creating new sources of wealth and activating new opportunities of value creation. In this scenario, e-learning processes play a strategic role because they are strictly linked to knowledge production and knowledge creation, two fundamental ingredients of the innovation cycle.

The added value that technological tools can give teaching can be found in the peculiarities of the tools, which are more and more innovative, favouring interaction in a more and more realistic way. New e-learning tools, in fact, have the ability to rationalise and improve learning processes, allowing possibilities which support interpersonal exchange of knowledge and consequent building of new knowledge.

In this framework, cooperative e-learning activities, such as collaborative writing, is conceived as a new locus of competency development strategies. It enables the exploration of new knowledge domains and cooperative definition of new ideas and projects becoming an added value for knowledge society.

But, which are the main drivers people and organizations can leverage on to face of the above listed challenges? Some studies identify the following ones (Romano, 2009):

- open and dynamic innovation, to capture from internal and external sources potential sources of value;
- democracy of ideas, to make more effective decision making processes based on collective intelligence and active participation;
- creativity, to transform normal employee into extraordinary innovators;
- distributed leadership, to promote employees' responsibility and empowerment, and to diffuse leadership skills and behaviours at each organizational levels;
- lifelong learning, to make self-sustainable the competency update process, at individual and organizational level;
- new measurement systems, to capture and valorise both physical capital and intellectual resources.

These represent the main ingredients of cooperative learning approach, that wants to highlight not only the simple collaboration aspects, based on exchange of codified knowledge and information, but primarily the way of working together, as peers of a dynamic community engaged in reaching common objectives, creating new knowledge, envisioning new ideas. This implies sharing of background knowledge, mixing of heterogeneous disciplines, reciprocal transferring of experiences, mutual enrichment, thinking and working with others.

As many EU documents underline, to improve competitiveness and professional/personal development, cross-sectional skills are to be enhanced as engines for social innovation: creativity, entrepreneurship, critical thinking and problem solving. (EACEA, 2012, p.7; OECD, 2010, p.2). The above skills, as many studies mention, are favoured by a cooperative approach (Gokhale, 1995; Jonassen et al., 1998; Poce, 2012). In fact: "collaborative learning fosters the development of critical thinking through discussion, clarification of ideas, and evaluation of others' ideas. […] Therefore, if the purpose of instruction is to enhance critical-thinking and problem-solving skills, then collaborative learning is beneficial" (Gokhale, 1995).

Why cooperative learning should be more effective than individual learning: a Social Learning theory perspective

In order to understand why certain collaborative virtual learning environments are effective or not, it is important to reflect upon the theories that brought to the creation and employment of such tools. The issue here is why cooperative learning should be more effective than individual learning. One of the main reasons could be traced back in the so called social learning theory developed by Bandura in 1977. In particular, starting from behavioural studies, he realized that traditional behavioural conceptions of learning were not sufficiently accurate because did not take into consideration social influences. He distinguished between the acquisition of knowledge and the observable performance based on that knowledge (behaviour).

The idea was very simple and based on the consideration that every one of us may know more than what we actually show. Bandura realized in fact that cognitive factors such as beliefs, self perceptions and expectations influence learning. Accordingly, social cognitive theory distinguishes between enactive and vicarious learning (Woolfolk et al., 2008). Enactive learning essentially is learning by doing and experiencing the consequences of one's actions. It is important to notice, in this respect, that this is not seen as operant conditioning but refers to a different role of consequences. Operant conditioning, in fact, has to do with strengthening or weakening of effect. In enactive learning, instead, consequences are seen as "providing information". Our interpretations of the consequences, therefore, favour expectations, build motivation and shape beliefs. Vicarious learning allows learning by observing others. If we learn by observing other people in action, we engage cognitive factors, because we need to pay attention, construct images, remember, analyse, synthesize and so on and so forth.

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All the above processes imply an important mental activity, far from behaviourist conception according to which cognitive factors are unnecessary in the explanation of learning. As Woolfolk and his colleagues underline (Woolfolk et al., 2008): "In social cognitive theory both internal and external factors are important: environmental events, personal factors (beliefs, expectations, and attitudes), physical and social environment (resources, consequences of actions, other people, and physical settings) and behaviour (individual actions, choices and verbal elements). […]. However, these behaviours also reciprocally impact upon personal factors. As learners achieve, their confidence and interest increase, for example, and behaviours also affect the social environment. If learners do not persist or if they seem to misunderstand, teachers may change instructional strategies of feedback". So the process of reciprocal determinism is dynamic and ongoing. In social cognitive theory, self efficacy and self regulated learning are key elements.

Self efficacy is the ability to believe in our own capabilities of reaching a given objective (Bandura, 1997). The list of sources of self efficacy expectations includes vicarious experiences and social persuasion. Both the above sources are present when collaborative environments are developed and established. In vicarious experiences the subjects involved in the group often see the others' accomplishments as models and when the model performs well, the learner's efficacy is enhanced, while it is decreased when it performs badly. As regards social persuasion, elements in the group can benefit from the others supporting and strengthening their potentials. Increase of self efficacy is directly connected to motivation and to the setting of higher level goals for students. This allows us to think that it should be prompted especially in virtual environments where lack of motivation and engagement is one of the main reasons for drop out. The advantage in online cooperative learning environments is the possibility of sharing and exchanging knowledge, creating new concepts and ideas, supporting each other and, therefore, fulfilling precise aims. It seems clear, however, that in such environments the continuous possibility to interact with the other subjects involved in the action of learning allows a sort of natural path to self-efficacy and therefore to the enhancement of a substantial change of attitude of all the subjects involved in the process.

Cooperative writing and assessment tools: the experience at Roma TRE University

The theoretical framework described above underlines that cooperative learning seems more effective in order to develop critical thinking skills and individual cross sectional abilities, but one of the main issues in online cooperative writing activities is connected to which assessment model is more suitable to identify and develop the above skills: how to assess each participant's contribution? Which experimental and evaluation model should be employed?

In the academic year 2011/2012 LPS (Laboratory for Experimental Pedagogy) based at Roma TRE University (IT) carried out an experimental project, with the aim of enhancing higher education students' critical thinking skills, starting online cooperative writing activities. "Critical thinking skills and the reading of the classics", that's the title of the initiative, allowed

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to devise an assessment model to be used on texts, produced individually as well as cooperatively, to identify higher education students' critical thinking skills.

The project had the following objectives:

- to start a teaching and learning activity on a specific topic according to a well established model of inquiry;
- to organize and coordinate guided discussions on a dedicated virtual space, provided to students for the above activity;
- to collect the insights of the online discussions and analyze them with lexicon metrics tools;
- to measure the students' critical thinking capacity via an adapted Newman, Webb, Cochrane (1997) model, already used within the sphere of the previously mentioned department project on podcasting. This activity to be implemented by:
  - asking students, at the beginning of the education proposal, to undertake a short essay test on a certain topic that is related to their studies;
  - repeating the short essay test at the end of the learning activity, and assessing, via the same analysis model, whether an increase in critical thinking is found;
  - collecting the data and preparing the research report.

29 students undertook the pre-test (November 2011), which was a short essay on a text taken from Galileo, "Dialogo sopra i due massimi sistemi del mondo" (1632), and completed their work, as described below, on the e-learning platform dedicated to the project. On this platform, two lectures, on some passages taken from Rousseau, "Émile, ou De l'éducation" (1762), were podcast.

The data analyses were developed along the double diachronic and synchronic dimensions. In order to verify the evolution of the critical thinking skills of student, we used the following research tools:

- a survey to indicate the descriptive data of participants. To promote an individualized approach centred on defined didactic objectives, we created a student profile with the most frequent values, which provided the operative instructions to the research group.
- Lexicometric analyses of the written productions of students. Pre-test and post-test, blog posts and comments, short essay test: all the written material of students was analyzed in-depth to define the lexical components that referred to the critical thinking categories identified by Newman, Webb and Cochrane's model. The written productions were analyzed along a temporal axis to verify if changes had occurred.
- Application and verification of the categories identified by Newman, Webb and Cochrane's model. To integrate the quantitative-lexiconmetrics analysis, the research group introduced a qualitative analysis of students' written productions to verify the presence or absence of these categories. The data obtained were inputted in an Excel worksheet with the categories in the rows and the positive or negative values for each student contribution in the columns. Furthermore, the critical thinking contribution

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(CT) was calculated as the ratio between positive and negative values attributed to each category, through the following formula: CT = (x+ - x-) : (x+ + x-) where x indicates the category, x+ is referred to all statements contributing to the development of critical thinking as regards that particular category, and x- the not contributing statement always within the same category of analysis.

- Analysis of the temporal evolution of the collaborative final short essay. Students were divided into 5 groups to critically discuss the topics proposed by the tutor. Every group created a cooperative written essay online, using Sync.in, that does not require, for its basic version, mandatory registration neither the installation of any other software.

Sync.in is defined as: "a web based word processor for people to collaborate in real-time. When multiple people edit the same document simultaneously, any changes are instantly reflected on everyone's screen. The result is a new and productive way to collaborate with text documents, useful for meeting notes, brainstorming, project planning, training, and more" (http:// www.sync.in).

Students can connect real time to the web address where they are writing their document, open just to the group's members, so that to avoid intrusions by strangers. Once connected, group's members write their own contribution highlighting it with a different colour: this way the author is always identifiable. Every student could modify, integrate others' pieces of writing (Figure 1).

Syn.in cooperative writing system, moreover, allows carrying out a further assessment analysis: the study of comparison among all the digital text versions produced. Thanks to the timeline it is possible to highlight the evolution of the text itself and, if desired, retrieve the previous edition. Nothing is lost, therefore: a valid help to philology in the digital era!

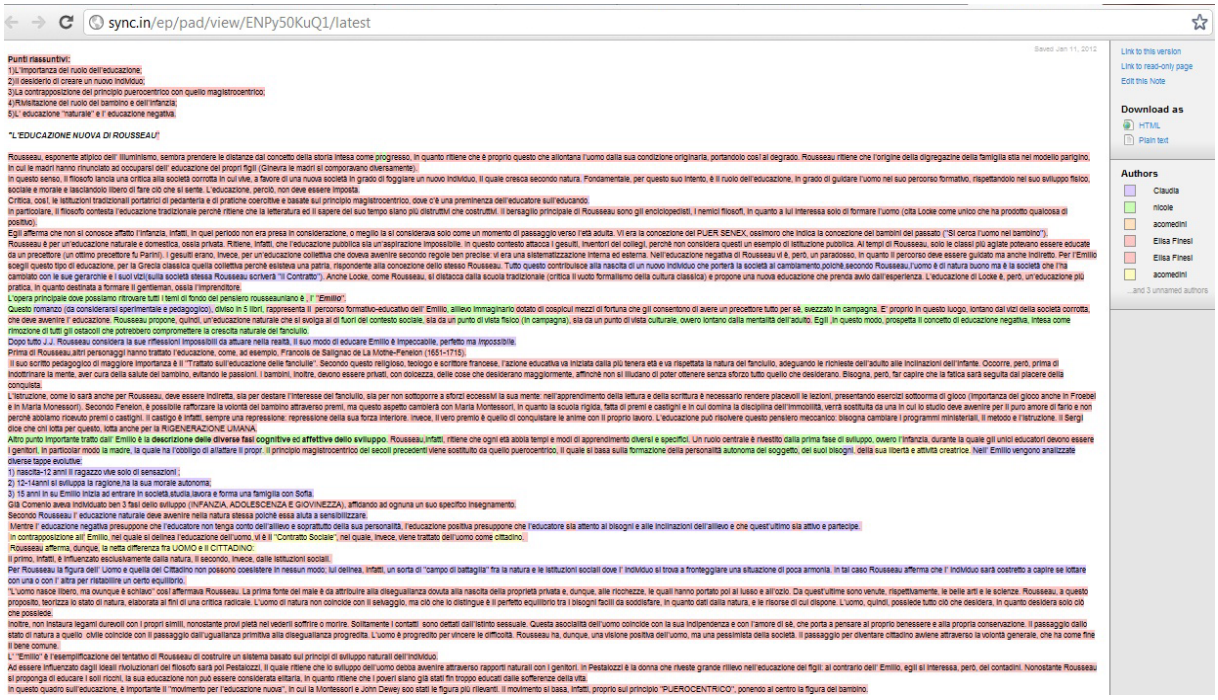

Figure 1. Example of a cooperative writing text made through Sync.in.

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An ex-post activity was carried out via an online survey addressed to participants who were asked to self-assess the competences developed within the project. The online interview was implemented with a free online tool, eSurveycreator

In order to assess the critical thinking skills, the students' written productions were treated with a lexicometric analysis using the Taltac software, and with content analysis, through an adaptation of the Newman, Webb and Cochrane (1997) model. The main categories of the analysis include relevance, importance, introduction of new ideas, information and solutions, reference to personal experience and opinions, clarification of doubts, new knowledge, elaboration of new solutions, critical evaluation, practical use of new solutions, comprehension width.

Results and conclusive remarks

The early analyses concerned the essays produced on the passages taken from "*Dialogo sui due massimi sistemi del mondo*" and from Book I of "*Emile*" by Rousseau.

From the lexiconmetrics analysis, mainly carried out to verify that the categorization used to classify the students' essays was adequate, emerged that: *relevance* and *importance* are the two categories that report the highest number of positive values, as confirmed by both the graphic forms present in the average frequency band, and by the analysis of the repeated segments, which refer to the pivotal ideas of the passages proposed.

In the second *corpus*, compared to the first, it transpired that the identification of the key concepts had improved (*relevance* and *importance*), as shown by the recurrence of terms such as "of nature" and "natural education", which are at the basis of Rousseau's pedagogical concept.

In the first corpus, references to personal opinions, comprehension and reasoning ability, show a negative value in most of the essays, since students did not express a "critical evaluation". They did not produce an articulated and reasoned response but simply quoted phrases from the item, without introducing any critical contribution, demonstrating that they only understood the questions on a superficial level.

In the second corpus instead, comprehension and argumentation presented a more positive connotation compared to the first corpus. References to the cornerstones of Rousseauian pedagogy (natural education, forms of education, society, etc.) and the supply of new information (novelty, new ideas, information and solutions) were recurrent; for instance, mentioning scholars with points of contact with Rousseau.

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Content analysis also confirmed the data presented above:

- in the essays on Galileo, only the answers to the first question, relating to the categories of relevance, importance and comprehension, show a higher contribution as far as critical thinking skills are concerned, since the value of the ratio is close to 1. The other values are negative or very distant from one (1), thus less significant;
- in the essays on Rousseau, instead, critical thinking skills underwent a positive increase in all categories, and particularly with regard to reasoning ability.

At the end of the project (February 2012), students were asked to produce a short final essay on a passage taken from "*Il Saggiatore"* by Galileo Galilei, to identify a possible increase in critical thinking skills.

A lexiconmetrics analysis was carried out on the essays, similarly to the other essays produced by students (pre-test – November 2011 – and group test *in itinere*), where it emerged that the most represented categories are relevance, importance, comprehension and argumentation, as can be inferred from the lexical analysis, where full words with the highest frequencies refer to the focal points of the passage presented and the repeated segments.

A content analysis was, then, carried out, which confirmed the data resulting from the lexiconmetrics analysis, and in particular:

- in the answers to the first three questions and the fifth question, relating to the categories of relevance and importance, a higher contribution of critical thinking was measured, the value of the ratio being closer to 1. Amplitude of comprehension also has values very close to 1 in the first two questions and in the fifth question. The other values are less significant because they are negative or very distant from 1.
- Identification and comprehension of the essential parts of the passage, and justification of their own proposals, appears improved (relevance, importance, comprehension, justification): references to essential concepts are present, such as "inductive method", "scientific knowledge", "conscience development", "contact with nature", "doubt". The students own statements are more complex and articulated.

Comparing the results of the pre-test (November 2011) and the post-test (February 2012), the critical thinking contribution varied positively:

- in the pre-test, comprehension and argumentation presented negative values in most of the student essays, unlike the post-test, where they demonstrated an understanding of the fundamental points of the passage and argued more their responses.

Data presented here can be considered as a start in this kind of research and represent directions which support a further development of the studies, that, being related to such a complex ability as critical thinking, need careful deepening of the subject. One main conclusion can be stated, anyway, and it is related to effectiveness of cooperative work and collaborative writing in particular.

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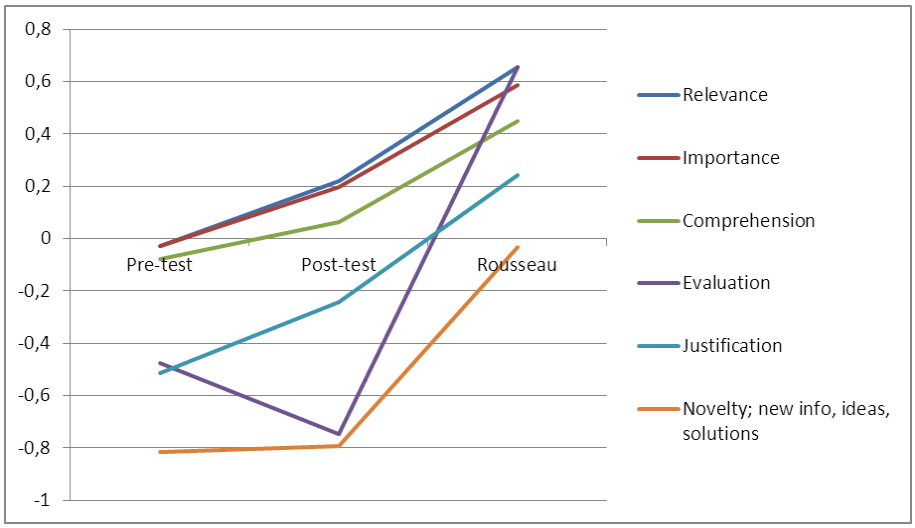

Figure 2. Summary of results – Each category/line represents the level reached according to the content analysis model developed, at three different moment of the investigation (pre-test/post-test/Rousseau online activity).

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[1] Antonella Poce is author of the present contribution, except for second section "Why cooperative learning should be more effective than individual learning: a Social Learning theory perspective" by Annalisa Iovine.

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FACEBOOK: WHERE STUDENTS ARE IN CHARGE OF THEIR LEARNING

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Abstract

Some academics see Facebook (FB) as distracting students from learning activities, while others embrace the environment and create class FB groups wherein they participate actively. Not much is known about the learning that takes place in groups without teachers. Students in a second year studio-based architecture class started their own Facebook (FB) group wherein lecturers were not invited. The aim was sharing resources and ideas and communicating after studio hours, hence the group also had a Dropbox linked to it. We followed a qualitative methodology to analyse how FB contributed to learning. Content analysis of the posts from two year-end examination periods used the Community of Inquiry framework (Arbaugh et al., 2008) for interpretation. True to FB nature, Social presence was the most prominent presence in both years' posts, containing humour and jokes and posts of an affective nature, often associated with stressful periods in their studies that lightened the mood. While teaching presence was the second most salient presence, it was higher in the third year, due to high traffic of administrative type posts. The second year also had a higher number of Cognitive presence posts than the third year, featuring mostly the Exploration construct. Interviews with the selected participants confirmed that the nature of the subjects and projects prompted different kinds of participation in FB, and that the FB group strengthened cohesion in the class. Students felt that they were the owners of the group and that lecturers were not welcome and would have inhibited participation. It was evident that, while students were in charge of their FB group, they were in charge of the resources needed for learning in different phases of their studies.

Introduction

Students are using social media on computers and mobile devices, whether their teachers like it or not. Facebook (FB) connects them to immediate and distant networks, and is part of their identity (Cheung, Chiu & Lee, 2011). That students own and are in charge of their social environment is indisputable. Whether social media contribute to or detract from actual learning is another question (Madge, Meek, Wellens & Hooley, 2009). Lecturers have been known to create and actively participate in class Facebook groups. Apart from the convenience of seamless availability across platforms and devices, such a teacher-moderated

group does not provide much more than a discussion forum in a learning management system. Both surpass e-mail in convenience as communication channel (Brady, Holcomb & Smith, 2010). The defining characteristic of FB is that students can own their group, control invitations, and do not need a lecturer's permission. Participation in social networking sites is associated with demographic factors (Hargittai, 2007), of which little has been explored in our country and communities. The research question of this paper is: How did a Facebook group contribute to learning in this context?

Context

The context of the study is a class of 123 architecture students at a residential university, who created a FB group at the end of their second year and continued using it for more than a year up to graduation. The architecture course was mostly studio-based, with emphasis on design concepts, explored through practical projects. A variety of theoretical subjects ranging from project management to environmental studies complete the curriculum. While some of the lecturers were aware of this group, and channelled information via the class representatives, none were invited.

One of the researchers was a student in the class and member of the FB group while studying, and, after obtaining permission from the classmates and ethical clearance, was allowed to read and code all posts. The research was conducted after the last exam; therefore did not influence FB behaviour.

Literature

Social media sites like Facebook are often at odds with the closed and regulated nature of higher education institutions, also due to the inability to integrate easily with learning management systems. Those very flexible and open network qualities enable integration into social constructivist learning environments, and have caused widespread adoption amongst adherents of contemporary learning theories (Leslie & Landon, 2008; Mircea, 2012). Social networking spaces that are owned by students, benefit the institution, as they facilitate the transition to University (Madge et al., 2009). Other benefits include the building of community due to sharing of social information, learning activities, personal stresses and life events. Students participate in both social and cognitive activities in these sites (Hargittai, 2007; Vignare, 2009). Several authors reported learning-related activities, like sharing resources in a repository, reviewing and providing feedback, reflection, revision, organising groups, and answering questions as well as administrative issues (Arnold & Paulus, 2010; Madge et al., 2009). While students are the owners of their social networking sites, they do not all wish to communicate with lecturers in FB and feel that their Universities should not intrude in their social space, which they wish to keep separate from their academic lives (Hewitt & Forte, 2006; Madge et al., 2009; Young, 2012).

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Researchers have established the integral role of Social presence in online and blended learning (Garrison, Anderson & Archer, 2000). Together with teaching presence and cognitive presence, it contributes to the establishment of a learning community and presupposes the presence of social-constructivist educational practices. These presences have been researched qualitatively through analysis of online discussions and resulted in the Community of Inquiry framework (CoI). The CoI can be used for measurement of social, teaching and cognitive presence and instructional design in the non-classroom-delivered portions of a course. Social presence comprises personal affective expression where students feel emotionally and socially connected because they have open communication, group cohesion and a shared identity. When students form distinct impressions of each other, they have a sense of belonging in the course, resulting in the affective dimension of social presence. Open communication implies that students interact, discuss, participate and converse with others, whereas feeling their viewpoints are acknowledged, and they can disagree without losing the sense of trust, contributes to group cohesion (Arbaugh et al., 2008). Teaching presence indicates activities that contribute to organisation, design, facilitation and direction of processes that result in meaningful learning. These can include the communication of course topics, due dates, course goals and frames for activities. The facilitative role implies guiding, identifying areas of agreement or disagreement, encouraging exploration and collaboration. Direct instruction is also accompanied by feedback. Those activities are not limited to the teacher, but in a learning community, students can assume those roles (Arbaugh, 2010; Garrison et al., 2000). Cognitive presence results from activities that foster critical thinking (Garrison, Anderson, & Archer, 2010), indicating deep and meaningful understanding of a concept. It is based on the Practical Inquiry Model and consists of four phases, initiated by a Triggering event that poses a dilemma, problem or question that prompts interest to proceed to Exploration. In this phase, students brainstorm ideas with others, explore and discuss ideas. In the Integration phases, new possible solutions are formulated upon combining of information. The final resolution phase comprises the testing and implementation of new solutions, signalling successful resolution of the initial problem (Arbaugh et al., 2008).

Methodology

A design research approach (Reeves, 2006) was followed to investigate the use of FB by an Architecture class during their second and third years of study. Qualitative methods were used to analyse the FB posts of the students from two calendar months a year apart that contained the posts most relevant to their studies. The former-student-turned-researcher captured all the FB posts, counted and classified them, and performed inductive qualitative content analysis using Atlas.ti software (Hatch, 2002), creating a code-book to explain the codes. The validity of the analysis was high due to her familiarity with the context of the posts. The CoI instrument questions (Arbaugh et al., 2008) were then used to group the codes into CoI constructs. Significance of differences in the code frequencies from the two periods were calculated with the chi-square test. A year later, individual semi-structured interviews were conducted with the students who were most active in the periods under scrutiny. The

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interviews provided the key to interpreting and triangulating the findings of the content analysis.

Findings and discussion

Before attempting to analyse 8834 FB posts, they were grouped into calendar months in order to select the most productive periods to survey. The two November year-end exam periods each had the most posts, namely 1,537 in the second year and 1,318 in the third year. As those periods also represented high learning activity, they were selected for analysis. Other very active months corresponded with major design group-work projects and completion of the final third year project, each with about 1,000 posts. During the year-end holidays, posts fell to an average of about one a day, confirming that the functioning of the group was closely tied in with learning activities.

From the class of 123 students, 69 contributed at least one text-containing post in any of these exam periods. Note that "likes" were not counted. Figure 1 shows the number of posts by each individual, sorted from high to low numbers posted during the second year sample period.

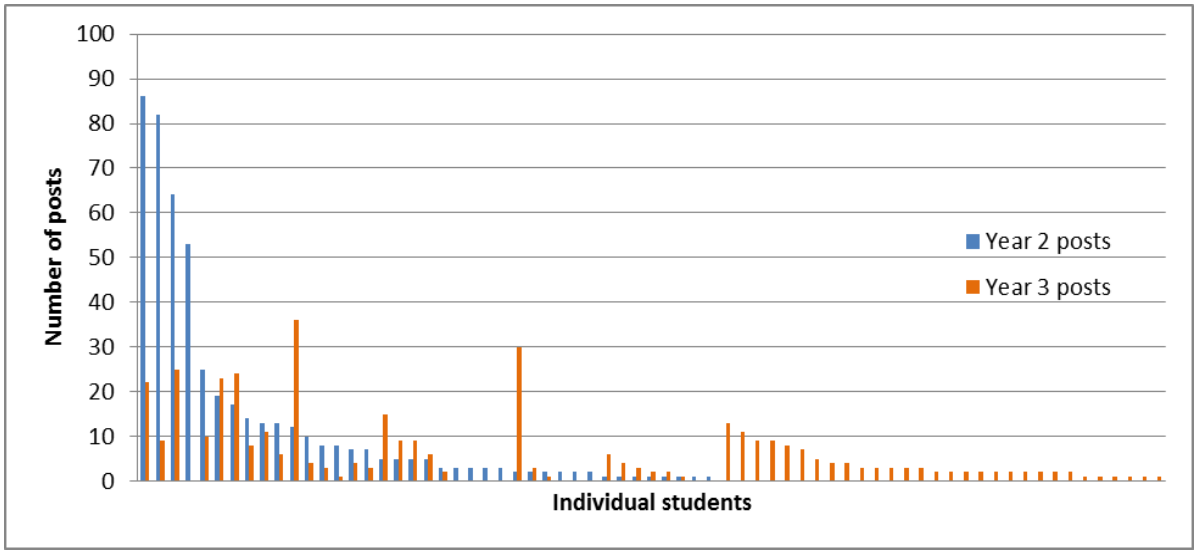

Figure 1. Number of FB posts during November exams per individual student

It is evident that four students practically dominated the second year exam time. Three of these four were serious students who posted only academic content, while the fourth one posted no academic content, and discontinued studies the next year. The leaders included the person who initiated the FB group and linked Dropbox, and invited everybody. During the interviews, they indicated that specific subjects taken at the end of the second year necessitated the distribution of resources, discussion of solutions to exam questions and particularly the need to critically engage with two highly conceptual subjects. They felt they had much to contribute to this closed community, showing an openness to share whatever resources and expertise they had. In return they wished to bounce their ideas off the others, and get feedback, because the subjects required critical thinking and careful formulation of answers. One of the challenging second year subjects was grounded in Mathematics, and

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created an opportunity for those who excelled in maths to explain problems to each other on FB. The platform suited the purpose. Bouncing ideas was beneficial to all.

The interviews confirmed that a small number of students were responsible for most of the FB traffic throughout year 2. The rest of the class were happy to follow and *like* and benefit from the information, but did not really need to add to what was already there. Thirty-five students contributed moderately to FB during the second year exam, while the rest of the class read without posting. The discussion content at this time reflected the needs in their courses that prompted the creation of the FB group.

In their third year, the leaders of the previous year did not continue to dominate the group, and new leaders emerged, as seen in Figure 1. By the final exam 30 students who were silent the previous year, were active. It was evident that there was no general trend in how students participated in FB. We wanted to know what prompted interviewees to change their online behaviour over time. The answer was in the nature of the subjects, which in the third year required factual answers and fewer ideas; left no room for interpretation. The nature of assignments also changed in the third year to more individual topics where others could not make such important contributions. The mathematics-based subject was less challenging due to open-book tests. In one subject, they received all administrative content in the learning management system, hence there was no need for discussion on FB. Interviews with the prominent participants of the third year revealed that most people asked administrative-type questions to which others would respond. A new theme that surfaced in the interviews was the importance of doing things correctly and timely and improving marks. Whereas those who dominated the second year did not engage in social discussions, the social dimension was important to the leading participants in the third year. The CoI was used as framework to interpret the qualitative analysis findings of the FB posts, and showed more clearly the difference in the nature of posts from the two periods.

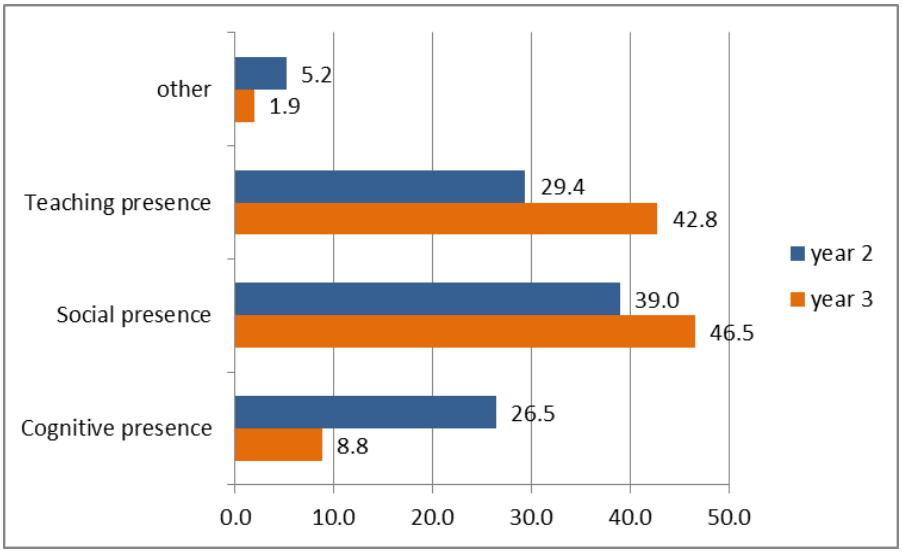

Figure 2. Percentage of exam-time FB posts reflecting CoI presences

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Figure 2 shows that in both exam periods, posts that portray social presence were the most salient of the three presences. Surprisingly, even in the absence of a "teacher", the second most prolific type of posts were coded as containing teaching presence, with a significant difference between the two years. Cognitive presence featured less prominently, but the difference between the years was also significant. The second year displayed a more balanced distribution of presences, reputedly indicative of social constructivist learning, whereas the third year CoI profile suggested an instructivist approach. Those trends were confirmed by the analysis of the student interviews, as discussed above. In order to examine which topics in the discussions were responsible for the differences, Figure 3 shows the actual numbers of posts in each construct.

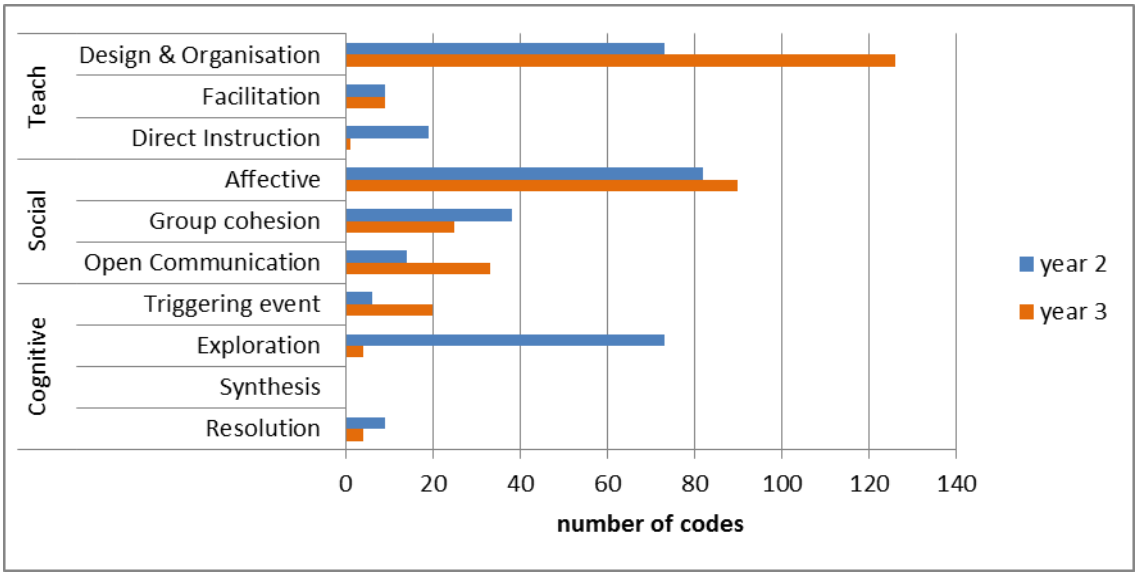

Figure 3. Number of exam-time posts coded according to the CoI presence constructs

Figure 3 shows in more detail how the nature of the posts in the class differed from the one year to the other. In the second year, teaching presence was evident above all by *asking direct questions* in FB (24) followed by *direct answers* (19) and *what they should study* (14), all contributing to Design and Organisation. The following year, teaching presence consisted prominently of *sharing old papers* and *hand-outs* with the class, and information about the *format of the report* to be handed in. Administrative information like *crit* and exam timetables featured strongly. Resources were shared in the Dropbox linked up with the FB group. The number of items up- or downloaded was not tracked. In the third year, many posts requested exam papers and class handouts. The interviews confirmed the value of previous papers and memos in third year subjects, particularly as students were preparing for the exam.

Social presence in the second year was most visible in emoticons, jokes, humour and purely social activities, that portrayed mainly affective constructs, which did not change much into the third year. The *crits* in both second and third years were very stressful and the humour in FB served as antidote that lightened tension. In both years group Cohesion was evident amongst the participants in the FB group, which paved the way for Open Communication. A new face of Social presence emerged in the third year, with more Open Communication

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codes, indicating that students felt part of the group, but expressed their own identity and felt free to voice strong or even negative opinions without fear of rejection (Arbaugh et al., 2008). Students shared in FB when they were suffering to finish projects and were tired due to lack of sleep, and fostered camaraderie amongst everybody who took strain. This high-stress scenario was more prominent during the final exam. Those posts included offensive remarks. The interviewees mentioned that some students needed this platform to vent feelings and get frustration off their chests. Students felt strongly that lecturers were not welcome in their group; they saw it as private and owned the space. In the presence of lecturers they would not have benefitted in the same ways, and would have been less forthcoming in their comments and shared less of their ideas. It was suggested in the interviews that channels for communication with lecturers should be separate, consistent with Hewitt and Forte (2006) who reported that students wish to separate their social and academic lives in social platforms.

The most interesting difference between the two years was seen in the cognitive presence. The 70 Exploration posts in November of the second year, consisting of discussion of answers and ideas, did not fully portray how students immersed themselves in those discussions. Amongst those were eight long conversations that consisted of more than 15 posts each, and ten super long posts of more than ten sentences. The need for those discussions started in studio, and particularly in subjects that required deep conceptual understanding and interpretation. As one interviewee said, "one cannot stay in studio 24/7"; the conversation followed them home on FB. The second year leaders generated new ideas and challenging discussions, and also did a lot of explaining, prompting Exploration contributing to Cognitive presence in particular. Lower levels of Cognitive presence posts in the third year reflect firstly the changed nature of projects which were more individualised than the previous year and subjects that required factual answers. In the third year students mostly asked for particular readers or articles to approach their projects, which were coded as triggering events, and they were not followed up by online exploration of new ideas.

Conclusions

We set out to explore how students in architecture used a FB group for academic purposes. We found that the FB group retained much of its social communication facade. The social aspects of FB posts were prominent with salient affective constructs that reflected the emotional ties among students who knew each other well from class and studio. Shared hardships supported long hours of stressful work on projects, while jokes and humour lightened moods. Social FB also provided open communication, where students could express themselves without barriers or fear of rejection. This openness was also evident in harsh language and negativity that was mostly tolerated and ignored. Students felt strongly that lecturers were not welcome in the FB group they owned and regarded as private space. In the presence of lecturers they would have benefitted less from the group as it would inhibit many to venture ideas. In the absence of tutors, some students assumed a teaching role and initiated discussions that provided both teaching and cognitive presence. Teaching presence consisted mostly of design and organisation-type activities providing administrative information, as

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dictated by the subject. When other subjects required non-factual integrative ideas, students responded on FB with long and involved discussions, creating a distinct cognitive presence. There is evidence that some individuals responded more on FB to the challenges of abstract subjects, while others responded more to factual content that would improve their marks. Facebook use was individual, transient, and reflected the personality and priorities of the users. As students had different learning challenges and priorities, they had different ways of using the social platform to address those challenges. By controlling their social platform, they took control of their learning.

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WIKIS AND OPEN SOURCE SOFTWARE – ESTABLISH COLLABORATION COMMUNITIES

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Abstract

Technologies for e-learning, particularly collaborative web-based programs, are valuable pedagogical tools that facilitate open learning and distance education. Collaborative online programs are electronic platforms that enable users to review, edit and contribute content with the purpose of cooperatively developing new understanding. They are especially effective teaching mediums because they reflect the tenets of distributed cognition, situated education and constructivist learning, which are particularly useful for teaching.

This paper will begin by presenting a review of the literature related to collaborative e-learning technologies. The focus will be on wikis and open source software because their purpose is primarily to facilitate joint enterprises and collaborative work. They are also particularly useful in academic contexts and can easily be incorporated into online lessons. This paper will present the various types of wikis and open source software that are applicable to educational settings. It will discuss current trends in cooperative online teaching. Potential drawbacks of cooperative platforms will also be discussed, followed by means that educators can mitigate these problems. The pedagogical advantages of using collaborative web-based programs will then be presented, especially in terms of how they support distributed cognition, situated education and constructivist learning.

Because of their benefits, this paper proposes ways in which collaborative web-based tools can be employed to facilitate learning. It also presents means of supporting spatial and temporal flexibility using these mediums, especially in terms of distance education programs. Applying collaborative web-based platforms using the methods discussed in this paper will help educators enhance the sharing of information, contextualization of content and construction of knowledge in order to optimize learning.

This study shows that collaborative web-based programs are particularly beneficial to teaching. It also demonstrates that they effectively support student learning in online environments. This is because they encourage teamwork, create communities of practice and promote learner-centred instruction. Given their numerous benefits, this study recommends that collaborative online platforms be further incorporated in educational contexts.

Introduction

Wikis and open source software are types of collaborative online tools. Teachers increasingly incorporate them in educational environments, especially distance education programs (Wheeler et al., 2008). A wiki is an online system that permits users to modify and incorporate content (Bokhari & Ahmad, 2011). Educators primarily use them for collaborative work in e-learning contexts. This is because they eliminate geographical constraints to group endeavours by facilitating communication and coordination in an online environment (Minocha & Thomas, 2007). Open source software, on the other hand, are programs in which users edit the source code with the objective of improving it (Koohang & Harman, 2005). Similar to wikis, they are available online to all users, at no cost, and enable multiple individuals to produce a final product cooperatively (Koohang & Harman, 2005). Research suggests these tools are advantageous to e-learning contexts and student achievement (Bokhari & Ahmad, 2011; Matthew et al., 2009; Wheeler et al., 2008). As a result, teachers worldwide are using them for lessons and activities. Because of this, it is essential to analyze whether they reflect the tenets of essential learning theories, particularly distributed cognition, situated education and constructivist learning.

Theoretical Background

Before examining how learning theories apply to collaborative e-learning tools, especially as wikis and open source software, it is necessary to define the philosophies under consideration and explain their significance to student learning. This section discusses distributed cognition, situated education and constructivist learning in sequence.

Distributed Cognition

Distributed knowledge is intellectual information that individuals share with others (Hutchins, 2000). In a setting that supports distributed cognition, students and teachers work collaboratively to impart their knowledge and experience. Since individuals have different cognitive properties, it is essential that they share their understanding with others. This, in turn, advances the collective knowledge of the group. In addition to the social aspect of distributed cognition, students employ material resources to amplify mental processes, including technological devices (Rogers & Ellis, 1994). This is because cognitive artefacts are capable of increasing computational and memory capacities (Hutchins, 2000). Knowledge can also be distributed in time, which is beneficial to learning and pertinent to distribute cognition (Rogers & Ellis, 1994). In this case, historical events can be applied to current situations to develop a more thorough understanding of the circumstances and possible outcomes. Distributed cognition is particularly applicable to e-learning contexts because students use technological artefacts to access socially and historically distributed information.

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Situated Education

Information, from a situated education standpoint, is dependent on its purpose, setting and circumstances (Brown et al., 1989). Learning needs to occur through authentic experiences in order to ensure that acquired knowledge is accurate (Matthew et al., 2009). These experiences situate knowledge in the proper context, including both social and material aspects (Matthew et al., 2009). To accomplish this, students must observe and contribute directly in the community of practice (Ben-Ari, 2004). Additionally, it is essential that learners adopt the appropriate culture under consideration in order to contextualize its tools and concepts effectively. This not only ensures the information learned is accurate, but it also increases the likelihood that students will remember the information and be able to apply their understanding (Matthew et al., 2009). Although situated learning is most frequently applied to mathematics education, it has recently been employed to analyze computer science instruction and is, therefore, pertinent to e-learning contexts (Ben-Ari, 2004).

Constructivist Learning

Constructivism is a learner-centred approach to education in which students actively produce their own knowledge (Koohang & Harman, 2005). In this case, teachers facilitate learning, rather than directly instructing lessons. They provide students with the materials and resources they need to build their own understanding (Wheeler et al., 2008). Students participate in activities that allow them to apply their prior knowledge, generate new ideas, test hypotheses and, in turn, cultivate deep understanding (Begoña & Carmen, 2011). Although learners ultimately construct their knowledge individually, group discussions enable the sharing of information that can contribute to their understanding (Koohang & Harman, 2005). Research demonstrates that e-learning supports the tenets of constructivism (Almala, 2006). It provides an environment in which students access information and collaborate with peers to solve real world problems and develop a thorough understanding (Almala, 2006).

Review of Literature

The previous section established the theoretical background for analyzing collaborative online tools. This paper will now present a review of literature regarding types of wikis and open source software, followed by a discussion of previous research and current trends related to cooperative online teaching.

Types of Wikis and Open Source Software

There are numerous varieties of wikis that are applicable to educational settings. Wikipedia is the most established wiki platform, with greater than four million topics available in English (Bokhari & Ahmad, 2011). Other common wikis include WikiIndex that describes and lists existing wikis, Wikiversity that provides learning resources and The Teacher's Lounge that has lesson plans. Users are able to modify and add content in each case.

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Similar to wikis, there are many types of open source software. Linux and Mozilla are the most renowned open source programs (Koohang & Harman, 2005). The former is an operating system, and the latter is an Internet browser. Although both can be applied to educational contexts, there is also open source software that is specifically for learning; for example, Desire2Learn is an e-learning platform that allows teachers to create an online educational setting (Bokhari & Ahmad, 2011). Other well-known learning management systems include the following: Blackboard, Sakai, Dokeos, eCollege and Moodle (Bokhari & Ahmad, 2011).

Previous Research and Current Trends

With the types of wikis and open source software established, this paper will now discuss findings related to their use. Researchers have conducted significant investigations on the application of collaborative e-learning tools to educational contexts, including wikis and open source software. Numerous studies show a positive correlation between collaborative online programs and student learning (Begoña & Carmen, 2011; Matthew et al., 2009; Minocha & Thomas, 2007). Although some research demonstrates adverse impacts of using these tools in educational contexts, the majority of studies indicate that they are advantageous (Matthew et al., 2009). Educators are increasingly using interactive technology to facilitate collaborative learning because of its affordances (Wheeler et al., 2008). As a result of this teaching medium, students are becoming more active participants in their own learning (Begoña & Carmen, 2011). Teachers, on the other hand, are predominantly supporting students through engagement with their learning resources (Wheeler et al., 2008).

Although numerous researchers have performed studies on wikis and open source software (Begoña & Carmen, 2011; Koohang & Harman, 2005), investigations on how these tools support collaboration in terms of essential learning theories is lacking. This is particularly the case for the combination of distributed cognition, situated education and constructivist learning. There is also insufficient research on how educators can employ collaborative online tools to support fundamental learning theories. Therefore, this study will relate wikis and open source software to essential learning theories, specifically in terms of how they create collaboration communities. This paper will also discuss beneficial instruction strategies.

Analysis of Collaborative Online Tools and Learning Theories

Since the literature review demonstrated that learning theories need additional research regarding their relation to collaborative web-based tools, this section will discuss how wikis and open source software reflect the tenets of fundamental educational philosophies. It will also discuss potential problems and limitations regarding the use of wikis and open source software, followed by their learning benefits.

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Limitations of Wikis and Open Source Software

This section will examine issues with cooperative online tools in terms of whether they support distributed cognition, situated education and constructivist learning. It will study each of these theories in sequence, along with their limitations to facilitating collaborative learning. This section will also discuss ways in which educators can mitigate potential problems.

Distributed Cognition

Bokhari and Ahmad (2011) reported that online communication is problematic due to the absence of a shared face-to-face location. This results in asynchronous conversation, which can inhibit spontaneous idea sharing (Bokhari & Ahmad, 2011). If students who utilize wikis or open source software desire synchronous conversation, they have to schedule a time to communicate (Minocha & Thomas, 2007). This is typically challenging because students who use online collaborative tools prefer temporal flexibility. However, Bokhari and Ahmad (2011) note that, with the use of appropriate communication tools like live forums, these effects can be minimized. Minocha and Thomas (2007) also argue that many learners prefer asynchronous discussion because they have more time to reflect on content and control when they participate.

Another problem for distributed cognition is unequal participation among users of wikis and open source software (Wheeler et al., 2008). Individuals may choose to participate passively, by observing dialogue, rather than actively contributing content. In this case, they refrain from sharing their knowledge with the group, which inhibits the distribution of information. In this case, although other members will not benefit from their expertise, research shows that passive participants are able to learn from others exclusively through observation, thus contributing to distributed cognition (Wheeler et al., 2008).

Situated Education

The primary issue for wikis and open source software regarding contextualized education is the time-consuming process of cognitive apprenticeship (Ben-Ari, 2004). Ideally, for situated learning, a student chooses their desired profession as a child (Ben-Ari, 2004). Through collaboration with a master of a trade, in this case a teacher of collaborative online tools, students gradually increase their knowledge (Brown et al., 1989). Typically, this does not occur in the case of e-learning. However, this scenario is rare and primarily theoretical in any context. Also, although wikis and open source software do not allow for entirely situated environments, they do support the essential characteristics of contextualized learning by enabling students to participate in an authentic community of practice (Brown et al., 1989).

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Constructivist Learning

In addition to distributed cognition and situated learning, wikis and open source software inhibit certain characteristics of a constructivist environment. In order for students to produce their own knowledge, they need to be directly engaged in learning activities (Koohang & Harman, 2005). In the case of collaborative web-based tools, some students may refrain from actively participating in activities. They rely on their peers for information and others' contributions to group projects (Begoña & Carmen, 2011). This prevents them from constructing their own knowledge. Although this would present a problem, there is a tracking tool embedded in most wikis and open source software that enables educators to monitor participation (Begoña & Carmen, 2011). This discourages passive participation and promotes equal contributions to group work.

Pedagogical Advantages of Wikis and Open Source Software

Potential problems with collaborative online platforms can easily be resolved, and these tools offer numerous advantages to education. This section will discuss the benefits of wikis and open source software in terms of student learning. The focus will be on distributed cognition, situated education and constructivist learning.

Distributed Cognition

The principles of distributed cognition are present in wikis and open source software primarily because they establish environments in which knowledge is freely available for redistribution among individuals (Koohang & Harman, 2005). They do not constrain information with spatial or temporal boundaries. Rather, their information can be accessed online from different locations at any time (Matthew et al., 2009). Students retrieve this knowledge, and then input their own understanding by uploading and editing content. Individual contributions form a joint product that enhances users' collective expertise (Matthew et al., 2009). This process of cognitive cooperation facilitates the development of shared understanding and the construction of new knowledge. Research shows that this collaboration increases student comprehension and their ability to process information (Begoña & Carmen, 2011).

Situated Education

Wikis and open source software also reflect the theory of situated learning because they establish authentic communities of practice. These virtual workplaces can be applied to numerous learning situations because they do not limit learning to a time or place (Hung & Der-Thanq, 2001; Matthew et al., 2009). This flexibility enables wikis and open source software to support authentic education (Brown et al., 1989; Matthew et al., 2009). Activities conducted using these collaborative web-based tools also facilitate contextual learning. Skills students develop by collaborating with peers are directly applicable to professional workplaces (Bokhari & Ahmad, 2011). This includes the ability to work in groups, collaborate with others and use computer programs (Begoña & Carmen, 2011; Bokhari & Ahmad, 2011).

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New users go through the process of enculturation when using wikis and open source software, which also reflects the tenets of situated learning. They begin with passive behaviours, such as observing activity, posting comments and asking questions. Their participation gradually increases, and they become actively involved in the community. Users achieve enculturation when they contribute to discussions, edit content, share resources and develop projects autonomously (Ben-Ari, 2004).

Constructivist Learning

As well as offering learning benefits because of teamwork and authenticity, wikis and open source software are advantageous because they provide a learner-centred environment that promotes active student engagement (Koohang & Harman, 2005). Learners use prior knowledge and online information to construct their own understanding (Almala, 2006; Koohang & Harman, 2005). Students also collaborate with peers, and this fosters cooperative knowledge construction (Begoña & Carmen, 2011). In the case of cooperative web-based tools, teachers have a primarily supportive role. They scaffold student learning and facilitate collaboration (Koohang & Harman, 2005). They also encourage students to reflect on their learning, which further develops student understanding and increases information retention (Almala, 2006).

Pedagogical Implications

Wikis and open source software have numerous benefits for student learning, particularly because they reflect the principles of distributed cognition, situated education and constructivist learning. Given their advantages, this paper suggests that teachers employ collaborative web-based tools. This section provides instructional strategies for using wikis and open source software successfully, and discusses these tools in terms of distance education programs.

Incorporating Wikis and Open Source Software

Collaborative web-based programs can be incorporated in face-to-face classrooms or distance education programs. To use these tools effectively in either context, teachers should establish the online platform by creating the interface, organizing the content, listing participation criteria and specifying discussion questions (Almala, 2006). They should provide various types of activities that are authentic, contextualized and stimulating (Hung & Der-Thanq, 2001). Educators should also suggest related resources and encourage learners to seek additional information. They should support students throughout the activities by answering questions, giving prompt feedback and scaffolding learning (Almala, 2006). Finally, teachers should encourage students to participate and collaborate, which will help promote the co-construction of knowledge (Wheeler et al., 2008). These teaching strategies will help educators support distributed cognition, situated learning and constructivist education when using wikis and open source software.

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Collaborative Tools and Distance Education

Learning tools and teaching strategies that reflect the principals of fundamental learning theories are especially necessary for distance education programs. As discussed above, online learning can be inhibited by asynchronous interaction and lack of student engagement (Begoña & Carmen, 2011; Bokhari & Ahmad, 2011). However, by using the teaching methods described, wikis and open source software provide an ideal learning environment that supports distributed cognition, situated learning and constructivist education, despite spatial challenges. Use of these programs in distance education offers numerous other advantages, particularly because of their low cost and flexibility (Hung, 2001).

Conclusion

Wikis and open source software are valuable educational tools that effectively facilitate student learning in online contexts. They offer numerous learning benefits, especially in terms of supporting the principals of distributed cognition, situated education and constructivist learning. This is because they support collaboration, provide a contextualized setting and encourage active participation. Since wikis and open source software are particularly advantageous to student learning, it is imperative that educators employ these tools. With the appropriate pedagogical support described in this article, wikis and open source software can revolutionize education by facilitating open and flexible distance learning.

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THE EDUCATION LAYER – "BOXED-OUT" AND SHARED E-LEARNING

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Abstract

This paper proposes a new paradigm to change the current online learning spaces and practices. The Education Layer is a new outside-the-box (literally) learning management system for higher educational institutions to truly accept the Internet as the largest learning hub, therefore making learning more engaging and efficient. This newly designed system is in its preliminary design stages and hopes to pave the way to a new generation of learning management environments. Its objective is to truly adapt these environments to personal learning styles and student's online daily practices and behaviours, to help them achieve their learning objectives with increased motivation and engagement, within their institution, and beyond (sharing courses and resources with other institutions).

Introduction

Through a simple-to-install plug-in, all students of higher education institutions will be able to easily and quickly download and integrate a top or bottom Education Layer (EL), similar to a bookmark bar, activated through a simple click whenever needed, in all of their desk and mobile devices. The EL contains the student's preferred information and interaction options, considered necessary-by-them to help them guide toward achieving their courses' objectives (communication feeds, deadlines, resources, repositories, etc.). The layer can be used by one institution or by many, by sharing courses, communities, services and resources.

Key benefits:

1. easy to use tool designed for the digital native, accustomed to share, connect, build, save and create;
2. highly engaging and unobstrusive way for accompanying students in their learning path (avoiding the hassle of going back and forth between browsers/environments, the unnecessary time-consuming obstacles/information and the limitations brought about by a "boxed-in" educational environment or learning management system);
3. allows for simple sharing of courses, resources and more, amongst other partner institutions;

4. easy to install, following similar common used plug-in instalments.

The Education Layer aims at freeing the learning potential and path from the institutional box (learning management system or personal learning environment), and welcomes the internet as the individual's library and world of resources, tools and interactions of all types (Wen-Yu Lee & Tsai, 2011). The layer is 24/7 and is not limited to the usual institutional restrictions. Its main role is to support and guide the students, mentoring them in their path to learning, while maintaining quality, high engagement and motivation (Quilter & Weber, 2004).

Background

The arrival of the internet and the world wide web has brought about a radical change in the way we live our lives, and as the world is becoming more digital, there is an imperative need for redefining old formulas and ways of doing things, as these can now be done differently, and often, when used appropriately, help achieve better and faster results.

As soon as the internet was born, it was clear to higher education institutions that this new phenomenon was going to impact the way they had operated for centuries, and most of them looked for responses on how to incorporate these new advances in their daily practices (Noble, 1998). The first limitations that they encountered were from the faculty, who had a few concerns: would they be rewarded the same for reaching yet more people? How would this affect the copyright of their materials, words, comments and ideas? Would they need to acquire a new set of technological skills? What about security? With all of these challenges seen as initial obstacles, the leadership of major higher education institutions decided to start introducing online learning in their less-risky Continuing Education programs, which were often taught by professionals and not tenured faculty, therefore not running into economic or copyright issues, an area in which the institution could also take more risks.

The first online learning designs were generated at a time in which the potential of the internet wasn't clear (and still is how it will be shaped in the future) and, to minimize risks, faculty, instructors and administrators were brought in to participate in the design of these new environments, in collaboration with the new online instructional designers, specializing in this new media and channel. The result was/is an almost exact replication of the current model into the new model, generating online learning spaces in which to do the same "old" things, following the educational models of the 18th century […..]. Some of these replicated models that are not effective, efficient, nor engaging are (and not limited to):

- **forum/discussion spaces**: while in a traditional classroom setting the teacher asked a question to his/her students and only picked on 3 of them to provide responses, an online teacher doing the same gets as many answers as students there are in the class. Having to read/hear everyone is extremely ineffective and inefficient, and highly demotivating. It is time consuming and frustrating.
- **long readings**: digital natives read differently, scan differently and don't find traditional rhetoric as efficient tools or channels for learning. There is a clear sign that new learners prefer short bites of information to long readings, initially. Digital natives

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follow a different process for learning and acquiring information: from small bites to longer bites, to full reads. Natives want the control and a quicker filtering access to bits of information.

- **digital resources**: libraries have done a precious job in digitalizing resources, but these digital repositories are also a replication of old models and do not adjust to the preferences of natives. The current technology allows to "give life" to these resources in a way that makes learning more engaging an interesting to learners (annotations, sharing, etc), augmenting the knowledge and experience of the digitized text.
- **mentorship**: the role of the mentor as it was before the 18th century disappeared as education became industrialized/democratized, creating teacher roles that were more responsible for generating desired grades and certifications through controls and homogeneity, rather than by focusing in motivating students to excel. Current technologies allow for "the return of the mentors". With the current overflow of information, the need for mentorship increases and will be helpful to learners in their path to achieving their desired goals in a more effective, efficient and engaging way.
- **personalization**: most higher education online settings continue to follow the traditional educational model of one educational path for all. Current technologies allow for total flexibility, customization and personalization, there is no need for trying to fit all learners in one box.

Justificating the Education Layer

Embracing the reality of the digital natives is a requirement and a need for higher educational institutions (Corrin, Bennett & Lockyer, 2010). To believe that digital natives will sit down and read all of the assigned books from cover to end, to believe that they will not have any other browser open while they are in "our learning platform" or that they will not listen to another expert but their faculty member is, simply, a mistake. If we think that the latest information is in our institutional libraries, and that our community is the best for our students, then we would be making a mistake.

Digital natives are different (Jones & Shao, 2011), they're on, 24/7, constantly, and global. They multi-task, have short attention span, are impatient, and ambitious, amongst other key differences from their preceding generations. New learners are NOT like our generation, and we either recognize it and help them to be the best they can be, or we will just be creating a learning "jail" for them. We must "jailbreak" education, or they will rebel. We already have several/many rebellious examples, such as Khan Academy (Khan, 2012), the University of the People, and Peer to Peer University, and the latest MOOCs trend (Downes, 2012), amongst others. And we also have seen responses to this new trend from Stanford, Harvard, MIT and UC Berkeley (edX), who seem to know that something is happening but also seem to be unsure of what, as they do not offer yet a new model, but are working with what already exists and ensuring that they're "game" in the educational revolution. Is opening up the courses to the masses the solution to learning? Is it all about resources? Access? Mass access? What is the immediate future and need for learning in higher education? The Education Layer thinks and acts digital, and focuses on what learning means in the present, what it is and how it works or

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may work for the generations that follows, as long as the educational accreditation continues to be needed (and we may see this disappear as well).

The new Education Layer aims at creating an educational solution for the digital learners, to advise and mentor them while on their path to achieving a particular goal, in the noisy confusion of the world wide web.

Design of the Educational Layer

Designing involves the collaboration and participation of an interdisciplinary team of people, diverse in ages, gender, culture, profiles, experience and expertise. It also involves a commitment to inclusiveness and openness, so the design follows open source standards and tries to ensure that it can be used by users of different abilities and skills.

The Educational Layer requires a simple installation, and an institutional login, to authenticate the user as a registered member of the higher education institution and be able to access other institutionally restricted areas, when needed (such as grades, library, registrar and others). The layer also allows for all partner institutions to share desired courses, resources and spaces (amongst others).

The following are early mock ups for the design of the Education Layer, to help visually demonstrate how it will work when implemented. The following images will highlight:

- **Access point**: top, side, or bottom access click or activation button.
- **Menu bar 1**: is a 1-row bookmark-type bar, with top selected information.
- **Menu bar 2**: is a 2-row bookmark-type bar, with extended top selected information.
- **Augmented over layer**: second-level of layer information, extending the layer to visualize further key related information.
- **Small side notification layer**: a facebook-like notification layer with the latest news to which the learner chooses to subscribe to (new dates, recent live-feed, etc.) with action options (likes, keep, unread, etc.).

The following image (Figure 1) represents one example of an access point once the user has installed the plug in. In this case, a button similar to that of the standard "feedback and support" is provided, as users are already familiar with this functionality, removing the learning curve altogether.

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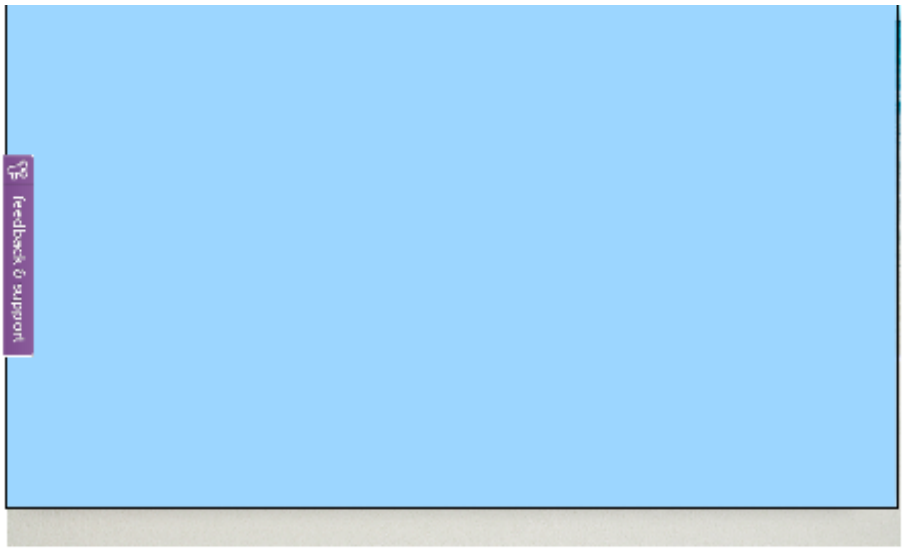

Figure 1. Option of access to the EL

Figure 2 below shows one option for the layer to appear in the user's browser, at the bottom (desktop or tablet device). In this instance, the user has selected to display:

- **MyCourses**, from my credit institution of from a networked institution.
- **Calendar**.
- **Messages** from faculty.
- **Live twitter-like feed**, latest feed appearing as it is received (from the users community of interest, previously edited).
- **Add a link** button, similar to the pinterest "pin it", to bring anything from the web into the learner's own repository – shared or private.
- **Mentor**.
- **Edit** or setting options.

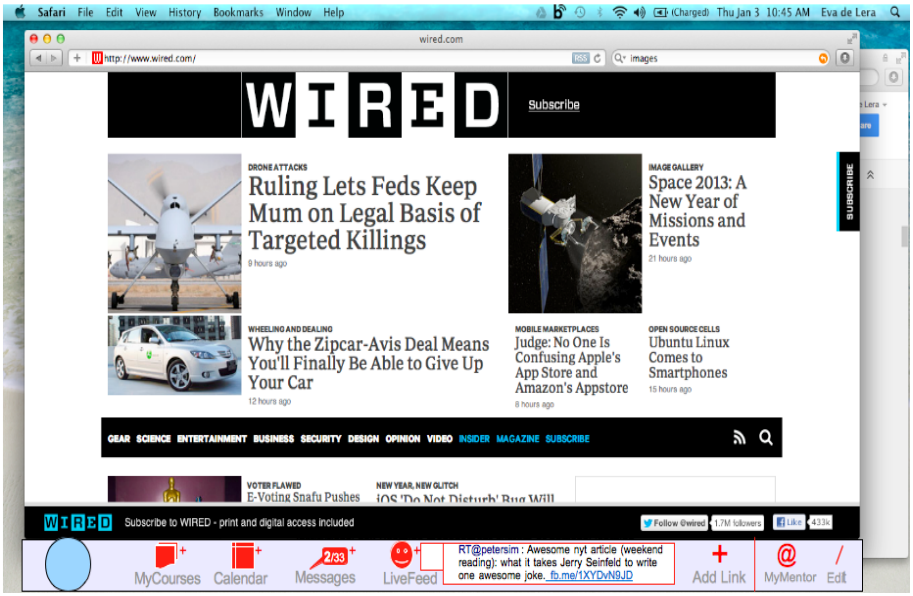

Figure 2. Menu bar with 1-row

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The image above (Figure 3) shows yet another option of visualization in which the layer bar is doubled, for those who prefer higher level information of several types easily visible and accessible to them. This can appear in either top or bottom of the screen (bottom suggested).

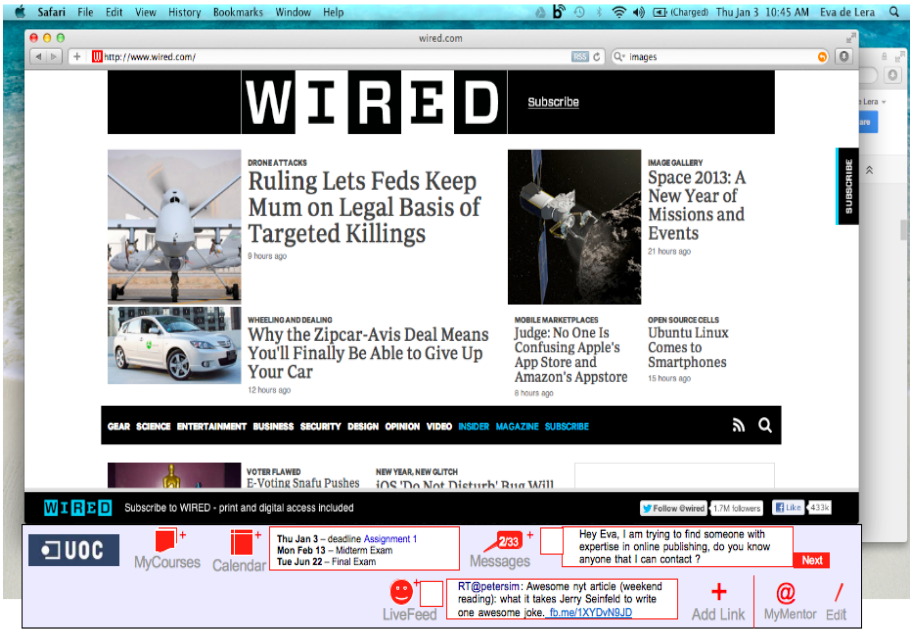

Figure 3. Menu bar with 2 rows

Figure 4 shows the bookmark-menu style bar on top.

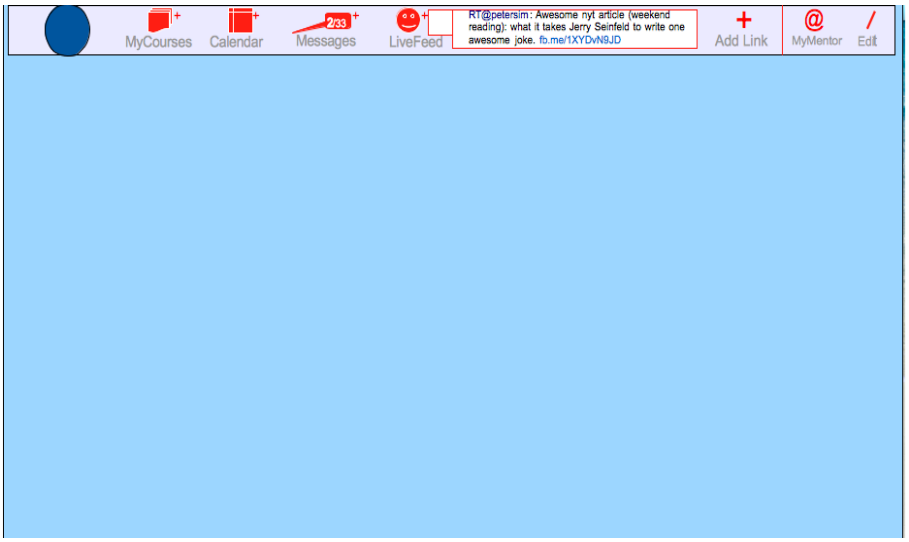

Figure 4. Top 1 row menu bar (bookmark-bar style)

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The following image (Figure 5) offers the second level of visualization:

Figure 5. Second level of visualization option

In this second level of visualization, the basic options appear to the user, as a next level shortcut, still avoiding entering a main full institutional browser. It is an "augmented" layer of shortcuts and information.

And lastly, the next image (Figure 6), represents one of the options to date quite preferred by the digital natives who are heavy users of social networks: the notification layer. In this layer the learner selects in settings/edit the type of information he or she wishes to be subscribed to and receive notifications for.

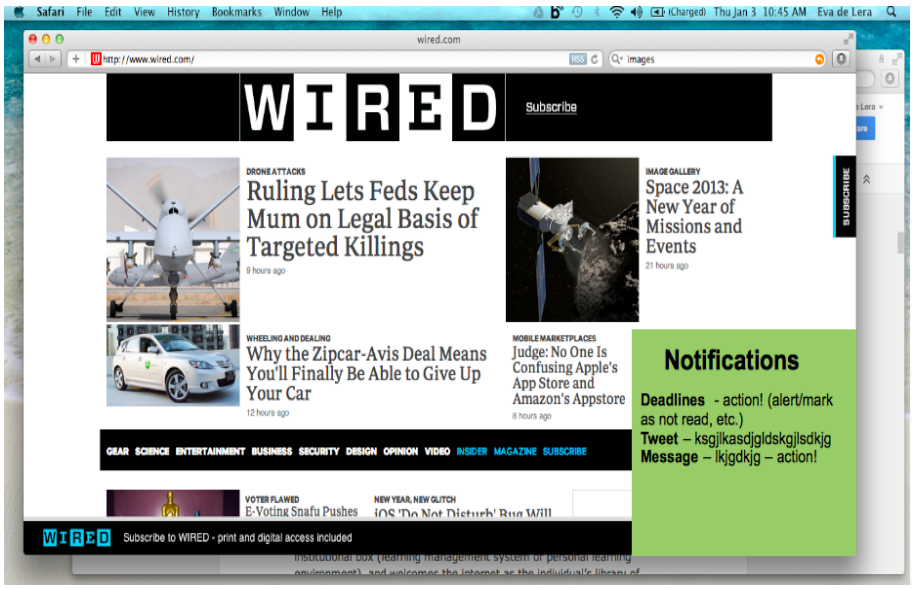

Figure 6. Notification layer

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As seen in all of the above images, there are three different levels of visualization, all adjusted by the learners themselves, according to their needs and preferences. It is expected that the notification layer would be the most commonly used, followed by the bookmark menu type visualization layer (that could take single or double space) and which includes the learner's key and most important information. The second layer takes a secondary priority, yet acts as a middle step before having to go to the "boxed-in" environment.

Education Layer Network of Institutions

It is the goal of this Education Layer to work in collaboration with other institutions so courses, communities, services and resources are shared and become easily accessible to all learners. Partner institutions may offer different level sharing options (i.e. share only some courses, some tools, etc.). The collaboration options are endless.

Conclusions

The above described Education Layer is at its preliminary design stage and will require further iterative testing and evaluating. It works toward creating a new learning paradigm, from a boxed-in environment to a boxed-out and shared one, in which:

1. The internet assumes its "earned" role as the learning hub, where all resources, discussions and communities live.
2. Faculty/teachers revisit their role as mentors which holds the key to inspiring learners to excel in whatever it is they wish to accomplish, helping guide learners in the filtering that is needed when encountering the vast amount of information available in the internet.
3. Learners can easily personalize and customize their "inputs" (information they receive) in a way that adjusts to their "digital lifestyles", in their pursuit to learning.

The Educational Layer aims at becoming an extension of current higher educational online learning environments to increase overall satisfaction and motivation (Paechter, Maier & Macher, 2010), providing learners with a new way for pursuing their learning goals and objectives, one which is more effective, efficient, and engaging.

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WRITING YOUR WAY TO READING – ON THE COMPUTER WITH A SOUNDING KEYBOARD AND A SYNTHESIZER

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Project for adult immigrants

In 2011 Vox, the Norwegian Agency for Lifelong Learning, started a project to pilot the method "Writing your way to reading" in Norwegian language training. The background was the need for increased knowledge about methods and improved quality in literacy training for adult immigrants.

Description of the method

A sounding keyboard and a speech synthesizer are connected to the computer. When you touch for example the letter k on the keyboard, you will hear a voice pronouncing the sound of the letter (not the name of the letter). When the word is completed on the keyboard, it is read out to the learner.

Figure 1. Film: http://www.vox.no/stl

Background and context

Functional reading and writing skills are a prerequisite for participating in various arenas in Norwegian society. Learning to read and write for the first time when you have reached adulthood and in a language you are unfamiliar with, is both time-consuming and resource-intensive.

The idea of starting with writing instead of reading is not new. The Norwegian Arne Trageton from the University College in Stord revitalized a 200 year old approach to learning to read already towards the end of the 1990's. He then started working with the method "Writing to read" on the computer, specially focussing on that the children should not start off with handwriting.

In 2004 Peter Elbow was referring to older projects when he advocated changing "Reading and Writing" to "Writing and Reading"

In Sweden special education teacher Mona Wiklander developed Arne Trageton's method further, adding a sounding keyboard and a speech synthesizer for children speaking their native language.

Building on experience from Sweden, the method was then tried with children speaking Norwegian as a second language before being introduced to adult immigrants from 2011 onwards.

Literacy training for adult immigrants

Learners often have a poor basis in oral language when they start their Norwegian language training. The texts that they have to write should use the oral language of the adult learner as a starting point.

In literacy classes the participants are often at different levels in their language learning process. Some know some letters, others don't.

It is a challenge for teachers to explain the connection between the abstract phenomena of sound/phonem and letter/grapheme to learners who have no knowledge of written language and in addition, do not understand the language the teacher is using.

Adults with no experience of writing usually take a long time to develop handwriting that is efficient and that corresponds to what is expected of an adult.

The learners often have little or no knowledge of or experience with ICT.

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The project

The project is exploring the effect of the method in literacy training for adult immigrants.

In 2011 and 2012, the method has been tested in different schools for adult learners in different parts of Norway.

Vox wants to find out if:

- The method creates a linguistic awareness of the relationship between sound and letter.
- The speech synthesizer is a help in reading (decoding) and spelling.
- The method takes care of the need for adapted training to a greater extent than traditional training in reading and writing skills.
- The participants may start from their individual level.
- The focus on oral teaching is increased and requires the teachers to work systematically with oral teaching.
- Writing on a computer increases the digital competence of the participants. In 2012 digital competence was a goal in the national curriculum for the first time and it is integrated in all the competence goals for language learning.

Results

Experience so far is positive. Vox started out intending to investigate whether the method was effective in teaching adult immigrants how to read and write.

We experienced that it also created joy and pride in learning.

> *"It is positive to observe that the computer tools also inspire the students to write their own texts"*

> *"The students are very motivated and the level of activity is high when they are working on the computer"*

More findings will be available in June 2013.

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INNOVATION IN UNIVERSITY LEARNING WITH NEW TECHNOLOGIES

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Summary

Educational innovation should be regarded as a dynamic, multidimensional and open process, immersed in a socio-cultural reality. It should contribute to personal growth and to the improvement of institutions. Nowadays, terms like innovation, reform, renewal, and change, are used and frequently found especially in university contexts after the Bologna Process has been adopted. It involves necessary and desirable changes resulting from new approaches to knowledge acquisition by means of new information and communication channels. A key element underlying concept renewal and innovation of the processes in higher education is the so called teaching-learning model directed towards to the development of skills, driven not only by the new educational trends, but also regarded as mandatory by law. A research conducted by a multidisciplinary group attempted to identify the degree of digital competence of Spanish university students, which is required for the use of virtual communication methods. It also established the training needs expressed by students and the problems they underwent when using virtual tools.

The obtained results allow us to infer the digital technological literacy. Although this literacy is progressing and spreading, it is not universal and, therefore, seeking innovation based on new technologies deems necessary. The research reveals the need to continue defining the concept of virtual core competences, as well as the fact that students must receive continuous training in these competences. Other findings reveal some concern about network security and the distrust of data provided by chats and forum users, since the digital gap and its implications keep on growing. As an educational foresight of this research study, we propose a new target focused on the appropriate training for using virtual tools, regarding competence, knowledge, expertise, respect and non aggression. An emerging ground opens to higher education: the training for a safe use of virtual communication tools in the network, as a resource and purpose of academic innovation.

Theoretical Basis

A new setup for university learning

Currently, any physical space is computationally capable of being connected with other spaces, real or virtual, through networked devices. The education sector must adapt to these new demands, where increased activity fosters virtual telematic data exchange, in many cases with an important visual content. Technology offers two complementary aspects: formal media and new ways of relating the contents (Fombona, 2008, p.21). This determines a significant amount of information that affects many users and clusters in social networks or other models, but still achieves the building of new knowledge. Academic specialists and professionals believe that innovation is the paradigm that determines the necessary changes in the field of higher education and that students must be prepared for a digital future. Change processes can be characterized mainly by a shift towards a new paradigm of creative and collaborative learning.

A research in Germany titled "Gestaltwandel und des Internets Aneignungsdynamik" presented some results in the magazine Media Perspektiven (Mende, Oehmichen & Schröter, 2013). The authors concluded that, in 2012, the use of e-mail had reached relatively stable levels around 80 % in all age groups, reflecting a constant growth of this so-considered useful tool since 2007, where only a 5 % use was reported. Additionally, sending photographs by this method contributed to its generalization and globalization. However, the main reason for its acceptance has been its usefulness and ease of handling. Forums have become a popular approach to communicate and transfer knowledge. Also, chats have continued to be well-liked within the youth. Facebook, on the other hand, is beginning to lose supporters, probably because of the conveyed feeling that communications are not genuinely owned, and consequently determining a loss of trust and security. The changes observed regarding the use of virtual tools can be mainly explained by the convergence and spreading of multiple mobile devices, as well as to the formats and content transmitted or found in them (Mende, Oehmichen & Schröter, 2013, p.48)

As concluded and demonstrated in Sevillano (2009, p.282), age plays an important role in innovative tasks and in the knowledge and management of virtual tools. Youngsters are more intuitive and talented for basic instruction technology use. This fact leads us to seek a permanent integration in university teaching-learning techniques, and deems necessary as an innovative resource for both contents and instruments, as well as in competences and learning skills. It is therefore optimal to practice with technologies that will challenge in an educational and instructive way. The scientific and technological advances, the commitment to individualization of learning, and the responsibility hand-over to the students themselves, force to innovate with technologies (Sevillano & Quicios, 2012, p.180). The concept of competence as a substantial element in the innovative process is a concern in the university environment, and thus a field for reflection and research. Another example of this trend, highlighting the requisite to define the extent of competence as well, can be found in Levi, (2011, p.152). In this PhD thesis, after an extensive analysis of numerous definitions of

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competences, it concludes that the correct formulation of competence must state the achievement of knowledge, ability, attitude or the combination in varying degrees of these components, by using the precise terms to define its content and how to achieve it. These are desiderative statements used to express the achievements outlined by the headings that determine the object. A key element underlying the conceptual renewal of educational processes in the university is called teaching learning oriented skills development model, driven not only by the new educational trends, but also resulting from imperative legal provisions (Levi & Ramos, 2012, p.25).

Research Design

Objectives

1. To identify the level of digital competence in Spanish university students when using virtual communication tools.
2. To rate the training needs and the problems expressed by these preset-day university students when using virtual tools.
3. To find out if the university student, as a user, has reached a balance between: know, know how to do, know how to be, and know how to behave.

Methodology

60 undergraduate students in Information Sciences from the Complutense University of Madrid (Spain) were selected. In terms of age, the sample varied + / - 2 years. A questionnaire was developed ad hoc; it was adapted to an already validated one by Aliaga (2004, p.443), consisting of thirty-two questions, twenty-six of which were closed-answers, according to the Likert scale response. The other six were open questions aiming to explore competences in the use of virtual tools: mainly, the difficulties that students encountered in the achievement of competences and their need to develop them to improve the use of virtual communication tools.

Results

A previous clarification should be considered with regard to the expressions used in the questionnaire; all answers were given using common youth expressions. This forewarning is highlighted because the definition of competence used could be regarded as incorrect according to an academic point of view; nevertheless, they are statements related to competence, technology or tool.

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Data obtained from the quantitative study

Table 1 shows the frequency of use, in percentage, of respondents in different competences.

Table 1: Frequency of use of respondents on several competences (data expressed as %)

Competence	**Frequency of use expressed in %**				
	none	**somewhat**	**moderately**	**much**	**excellent**
1. Make databases	18.3	40.0	18.3	18.3	5.1
2. Master information research strategies	8.5	20.0	18.3	25.0	29.8
3. Know advanced search information systems in documentary databases	21.7	23.4	35.3	13.2	6.8
4. Use video-camera and digital photography to obtain quality audiovisual resources	11.6	6.8	23.4	29.8	28.1
5. Use audio equipment for sound performance and composition	23.4	41.7	18.3	10.2	6.8
6. Can use images that I have previously reduced or retouched	3.4	35.3	16.6	35.3	10.2
7. Can animate objects	43.3	45.0	3.4	6.8	1.7
8. Can access and browse Internet	0.0	0.0	3.4	29.8	68.5
9. Know how the different searcher engines work	0.0	8.5	23.4	26.6	41.7
10. Can use e-mail	0.0	1.7	18.3	13.2	76.6
11. Can communicate in discussion forums	0.0	8.5	11.6	20.0	61.7
12. Can use chat	0.0	10.2	5.1	21.7	63.4
13. Can use distribution lists	20.0	26.6	21.7	20.0	11.6
14. Can create web pages	35.3	16.6	13.2	18.3	16.6

Data obtained from the qualitative study

Question number 27 asked for the core competences considered essential to successfully use the outlined virtual tools:

- Conceptually know what a web address and an e-mail are (Protocol 1). State the need to know (instruction).
- Basic computer usage (Protocol 13). State the need of how to do (training).
- Define and find in an optimal and straightforward way the information sought (Protocol 23).Combine the need to know (instruction) and the need of how to do (training) to feel competent.
- Know the language used by computers (Protocol 38). Requires greater knowledge (instruction).
- Understand the basic principles in Office. Know how to use the search engines (Protocols 40 and 41). Again they are focusing on knowledge (instruction) and how to do (training) forgetting knowing how to be, and know how to behave.
- Do basic computer courses (Protocols 66 and 51). They need to know (instruction) and how to do (training).
- Know all the basics of software and, further research-based assays, on how programs work. Follow a computer course (Protocol 58). Focus is directed towards their weaknesses on knowledge (instruction) and how to do (training).

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- Know how these media work. Know the different utilities and programs (Protocol 37). As academics, again, focus is centred towards their demands on knowledge (instruction) and how to do (training).
- Know how to use the computer. Learn to create an account and share information with other people's accounts (Protocol 14). To know (instruction) and how to do (training).

These answers and others alike were predominantly given.

Question number 30 of the questionnaire is an open question. This question focused on viewing the difficulties encountered by students to attain the necessary competences for using virtual tools:

- If you do not know how to use the search engines you do not find what you are looking for (Protocol 21).
- Lack of appropriate software (Protocol 34).
- Difficulty to verify the information sources. Poor security and control of the information contained in the network. E-mail and chats can be dangerous spotlights (Protocol 37).
- Information overload, digital gap, pages in other languages (Protocol 52).
- No lack of educational reflections, for example: "There is no safety" (Protocol 14). "There are good people on the Net, but also some bad ones" (Protocol 17). "You never really know if the identity of someone or something is true" (Protocol 26).
- "You waste a lot of time. I can't find what I look for. There are so many places to look for something that you get lost. There are new things each day you have to be aware of developments; it's hard to keep up-dated" (Protocol 55).
- The difficulties are huge due to lack of knowledge (Protocol 42).
- Some swindle, scams and dangers, even physical, in Chat and Internet (Protocol 56).
- Easy user level, but difficult to specialize (Protocol 53).
- The uncertainty of not knowing who you are relating to (Protocol 55).

Discussion and conclusions

The following competences stand out by their high degree of theoretical knowledge and practical ability, with excellent rating, judged with over 40 %: Can use e-mail 76.6 %; can access and browse Internet access 68.5 %; can use chat 63.4 %; can communicate in discussion forums 61.7 %; know how the different searcher engines work 41.7 %.

On the contrary, other competences obtained negative values and presented in a considerable number of students. In order from the most to the lesser level of ignorance, they were the following: Can't create web pages 35.3 %; can't install hardware components 31.5 %; can't use audio equipment for sound performance and composition 23.4 %; I do not know advanced search information systems in documentary databases 21.7 %; can't use distribution lists 20.0 %.

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The results reported allow us to infer an approximation to digital technological literacy. Although this literacy is progressing and spreading, it is not universal and, therefore, seeking innovation based on new technologies deems necessary. However, it must be assumed that its expertise and correct application to learning still remains a utopia.

There is a need to further define virtual core competences and train or advice students beforehand of the need for continuous updating in these competences. In the open questions analysed, some concern about network security was found. University students distrust data provided by users of chats and forums. They state the existence of digital gap and its implications.

As an educational foresight of this research study, we propose a new target for educators, professors, teachers, social educators, parents and anyone related to the innovative training and social stability; focus should be directed towards and appropriate education for using virtual tools, regarding competence, knowledge, expertise, know how to use, respect and non aggression. An emerging field opens to higher education: the training for a safe use of virtual communication tools in the network, as a resource and purpose of academic innovation.

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Note

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'SMART E-DUCATION' DIGITAL WHITEBOARD TO TABLET INTERACTION TO ENHANCE ACTIVE LEARNING FOR E-LEARNING 2.0

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Introduction

The evolution of information and communication technology (ICT) in educational environments is continuously improving and aims at increasing the learning efficiency of students. The Swedish National Agency for School Improvement published a report in 2008 that states the positive effects of ICT in schools, such as increased student motivation and improved levels of skills and collaboration (Twining et al., 2005). Today's generation of students traversing their educational phase – alias "Net-Generation" (Tapscott, 1997), "Generation @" (Opaschowski, 1999), "Digital Natives" (Prensky, 2001) or "Homo Zapiens" (Pelevin & Bromfield, 2002) – heavily utilise ICT in form of smart phones and social communication platforms. Nonetheless, their digital experiences are usually restricted to their private environment. This circumstance coerces educational institutions not only to offer appropriate services, communication and information-sharing possibilities, but tutorials and trainings for their correct usage as well (Nagel & Ebner, 2009).

In order to achieve this ambitious aim and to effectively embed ICT in educational environments a clear strategy for a management information system (MIS) is needed. This system should comprise the following basic specifications (Becta, 2006):

- Enable users to access the system away from the organization.
- The platform interface shall be accessible to its users via mobile devices.
- Identify and verify users uniquely.
- Enable only access to information appropriate to the user's role.
- It shall be possible for learner to import and export information by the platform.
- Support shall be provided for managing profiling information of students.

Basically, a MIS should serve as clear indicator as regards performance at an individual or group level. As a result, several benefits for different stakeholders such as students, teachers or administrators arise. Students can plan their next steps according to their current process with a focus on their identified shortcomings. For teachers it creates the possibility to find the best pedagogical strategies or needed content by being aware of the individual student's learning

profiles. Another benefit might be the dynamic management of learning materials and content enriched by examples originating from the students themselves, which might improve their understanding within the learning group (Lloyd, 2010).

Problem Description

The concept described above in form of the integration of face-to-face learning and online-based learning is known as 'blended learning'. The challenge here rests within the combination of both approaches without ending up with two separate approaches executed in parallel. Therefore, the concept of blended learning is more towards a paradigm shift in form a reconceptualisation and reorganisation of the dynamic flows of teaching and learning (Garrison & Kanuka, 2004). Lampoltshammer et al. (2012) adopted this thought of dynamic flows and suggested a learning platform, which encourages students to reflect given content and discuss it among their fellow students. The platform consists of a social network enhanced eLearning platform paired with process modelling tools adopted from the business domain. Having this approach in mind, two points of view onto the system can be identified – the students' and the teachers' perspective.

To cover the students' entry point to the suggest learning environment, digital technologies, such as Tablet PCs (TPC) offer a high potential to change the dynamics of a traditional classroom via wireless communication in combination with pen-based computing technologies. Due to the support of digital content, lecture materials may be audio and video clips or e-books. In addition, the TPCs offer a cost-effective option in comparison to other approaches associated with common equipment (Enriquez, 2010; Twining & Evans, 2005; Wise, Toto & Lim, 2006; Yost, 2007; Ifenthaler & Schweinbenz, 2013).

From the teachers' perspective, their main entry point during the lectures is the whiteboard. Digital variants of this classical lecturing tool have been around for some time. For example, in the Netherlands, 98 % of all primary schools own as a minimum one interactive whiteboard (van der Meij & van der Meij, 2012). However, it is still unclear how effective these tools are within educational environments and to what extent they perform superior to current approaches and tools (Smith et el., 2005; Lee, 2010).

Therefore, this paper suggests an experimental setup with a special focus on the use of a whiteboard in form of a touch screen as replacement of the classical blackboard to interact with students' TPCs – locally or remotely. The integration of TPC into classroom instruction strongly centres on students' learning as well as it focuses the effectiveness of teacher's instructional methods. But despite it needs to be accepted by students and teachers alike with an appropriate assessment of the impacts in TPC based classrooms (Koile & Singer, 2008).

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Approach

The core functionalities of the framework cover a classical teaching situation. The difference here rests in the audience participating interactively over their remote devices. Figure 1 depicts the core components of the suggested framework.

Figure 1. Core components of the eLearning framework

The **screen-sharing** feature provides the ability to mirror the screens of all tethered devices. Thus it becomes possible to share activities in real-time. The teachers are able to share their screens with all students and the students can share their screens among each other as well as with the teacher and the whiteboard. The whiteboard is intended as a central overview of the whole class. Every participant has an icon in front of his/her name indicating whether the participant is actually sharing something or not. If something is shared the 'moderator' at the whiteboard is able to swipe this content to the board and make it visible for everyone. Therefore, the teacher is able to review and summarise the inputs of all participants to actively align the lecture. If no whiteboard is available, the teacher's tablet serves as a replacement device.

The teacher can **share content** such as documents, figures, audio files, and video clips as well as the former recorded lectures. The contents are either streamed and displayed directly at the other clients' devices or made available as a resource on the server to provide 'flipped classroom' sessions as well. Hence, a personal reflection of the study content is possible according to the students' learning profiles.

Cooperative working groups can be established considering the students' profiles and the five basic elements of cooperation (Johnson & Johnson, 1999). The teachers can monitor the progress in every group so that they can offer guidance and assistance if necessary. Moreover, the teachers have an insight view on all activities of each group member. Thus, it becomes possible to distinguish between active and pure passive students. This enables the teacher to support and motivate the students in regard of their individual performance.

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The **pen-based** functionality allows handwriting on a tablet. This intuitive way of interaction enables the students to take notes of the lecture right away and annotate existing materials. For instance, this enables students in a mathematical lecture to carry out more complex formulae as well as to comprehend multifaceted formalisms in a more convenient way by sketching symbols and structures.

On-demand short exams can be carried out in order to gain the students current level of proficiency immediately. Based on the outcomes of these exams, the teacher is able to decide whether he or she is able to proceed further or has to repeat distinct parts of the lecture. Furthermore, from the individual records it is possible to generate a progress report for each student as personal feedback. Students and teachers alike are able to go through an assessment process for quality insurance purposes, which can be validated based on the monitored activities.

Framework Infrastructure

The whole structure is based on the server-client-principle (see Figure 2). All tablets and the whiteboard are clients, while the communication flow is orchestrated by the collaborative server. This server is the backbone and is responsible for bandwidth management, streaming, recording, rights and hand-over management. Furthermore, audio/video conferencing capabilities support the students and the teachers communication flow. However, the management activities are still carried out via the digital whiteboard or the teacher's TPC respectively. In addition, the server captures, processes and evaluates the students' learning progress in order to generate the individual profiles.

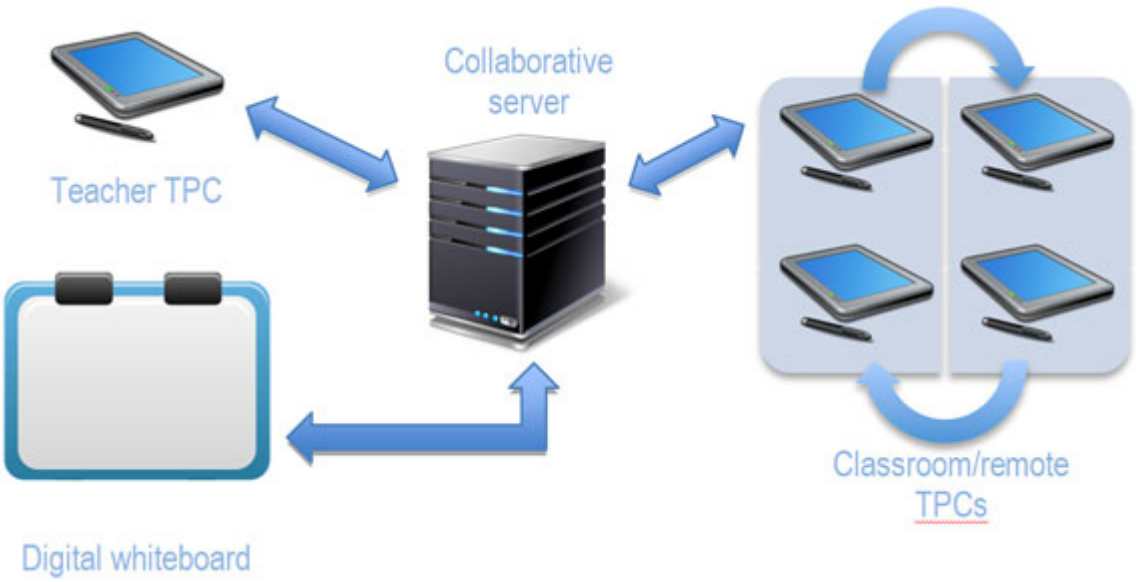

Figure 2. Visualisation – Hardware architecture

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The clients act as displaying devices of the lecture activities. Nonetheless, they are able to record the individual annotations to create personalised lecture notes. Besides, they serve as entry points to ask the teacher to provide novel content and to collaborate with each other. Anytime, the student is able to query the system about his personal progress.

The digital whiteboard offers the classical functions of a blackboard and acts as the front-end to the whole functionality of the framework. For instance, if a question arises out of the audience it is display on the whiteboard as notification. The teacher can then check the relevance of the question and if given open it to the audience and answer it. In addition, students can be integrated actively into the lecture by inviting them to demonstrate their solution to the given problem in real-time by granting them write-access to the whiteboard.

The teacher is then able to assess the student's performance digitally, which automatically generates an entry in the student's profile. The grading and management functionality is only available for the teacher and is not shared throughout the framework.

To guaranty interoperability, the whole logic behind the framework to interconnect the different devices is based on Java. The sharing functionality is provided by the *Samsung AllShare-Framework*. It allows to mirror screens from any device to another in real-time and to stream media and share documents via a given network. AllShare is based on the standard *Miracast*. It is an open peer-to-peer screencast specification that deals with the problems that arise from sharing high-quality real-time content between devices. It takes into account that the shared data is distributed to devices with different specifications and capabilities (ranging from TVs to smartphones). Miracast devices detect each other automatically and therefore reduce the effort as regards forming virtual learning groups and as such the environment as a whole.

Conclusion

ELearning 2.0 propagates the usage of social networks such as blogs and wikis to establish collaboration. The target is to offer an environment, which fosters the intrinsic motivation of the students. However, the main issue of such services is how to activate the students to reflect on the given lecture content by using external services, which are not integrated into the whole learning framework. Therefore, this paper suggested an experimental setup with a special focus on the use of a digital whiteboard, which provides the possibility to always interact in different forms with the fellow participants. Learning units can be embedded into given students' group workflow, which guarantees the active involvement of the participants.

Another advantage from the teacher's point of view is the assessment of the students. Exams can directly be done on the devices. Teachers prepare their tests and simply share them with the students. After finishing the exams the students just need to save their modified documents and the teacher can access the exams. The teaching staff can also grade the active participation in class. They see how active the students are or if a student is totally inactive.

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Students, on the other hand, have their learning material always accessible and up-to-date. All activities are saved; students can later review the discussed issues. They can communicate with each other, talk about homework, share results while working in teams or just 'keep in touch'. The social aspect must not be neglected.

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ENHANCING LEARNING WITH AUGMENTED REALITY: TEACHER CANDIDATES' PERSPECTIVES ON OPTIKAR

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Augmented Reality in Education

"Augmented Reality" is a new way of manipulating how we interact with the world. Without replacing the real world you're experiencing, this technology augments virtual information on top of the real world with continuous and implicit user control of the point of view and interactivity. It provides a composite view for the user with a combination of the real scene viewed by the user and computer generated virtual scenes. This is an augmentation of the real world by engaging an ordinary place, space, thing or event in a way that is partly unmediated. According to Milgram and Kishino (1994), it can be defined as any case in which an otherwise real environment is "augmented" by means of virtual or computer generated objects.

Augmented Reality technology is not a new issue. It has been used in fields such as: military; medicine; engineering design; robotics; telerobotics; manufacturing, maintenance and repair applications; consumer design; psychological treatments, etc. (Azuma, Baillot, Behringer & Feiner, 2001). This new approach enhances the effectiveness and attractiveness of teaching and learning. The ability to overlay computer generated virtual things onto the real world changes the way we interact and trainings becomes real that can be seen in real time rather than a static experience. Augmented Reality brings virtual information or objects to any indirect view of a user's real-world environment to enhance the user's perception and interaction with the real world. Augmented Reality tries to augment virtual objects on the real ones or scenes for maximizing a natural and intuitive user experience in real time. It is an interactive environment where a real life is enhanced by virtual things in real time. Augmented Reality allows the user to see the real world and aim to supplement reality without completely immersing the user inside a synthetic environment.

OptikAR: Augmented Reality for Basic Experiments in Geometrical Optics

OptikAR is an example of a simple marker-based augmented reality system. A simple augmented reality environment consists of a camera, a computational unit and a display. The camera captures an image, and then the system augments virtual objects on top of the image and displays the result.

Figure 2. Screenshots from OptikAR: Reflection and Ray Diagrams for Plane and Curved Mirrors

This project uses augmented reality to enhance the user experience regarding Basic Geometrical Optics and Experiments such as The Law of Reflection, Reflection and Ray Diagrams for Plane and Curved Mirrors, the Law of Refraction: Snell's Law, Total Internal Reflection, and Critical Angle. OptikAR is designed to turn hard-copies of basic experiments in geometrical optics into a digital, interactive experience. Augmented Reality brings virtual information or objects to any indirect view of the user's real-world environment to enhance the user's perception and interaction with the real world. This new approach enhances the effectiveness and attractiveness of teaching and learning. The ability to overlay computer generated virtual things onto the real world changes the way we interact.

The aim of the study is to determine how a teacher candidate feels about using a learning material enhanced with augmented reality. This study investigates users' feelings, opinions, expectations, acceptance, pleasure and deeper emotions regarding the experience of the OptikAR application. The participants of this study are four students (1 male and 3 female) from the fourth undergraduate year of the Eskisehir Osmangazi University, from the departments of Computer Education and Instructional Technology, Educational Sciences, and Guidance and Psychological Counselling. The findings represent student perspectives from a sufficiently diverse range of education faculty. They have voluntarily conducted all OptikAR experiments using guidelines and then participated in semi-structured interviews. Their feelings and opinions regarding OptikAR learning material, which is enhanced with augmented reality, were gathered.

Teacher Candidates' Perspectives on OptikAR

Following the development period, OptikAR was shared with users and their impressions were sought. To this end, participants who could analyse the application from different angles were preferred. Four prospective teachers were included in this study, consisting of one participant from the fourth year of each of the following departments: Instructional Design, Psychological Guidance and Counselling, Educational Technology, Science Teaching. Demographic information regarding the participants is provided in Table 1.

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Table 2: Participants' demographics

Teacher Candidates	Gender	Department	Age
TC-1	Female	Instructional Designer	22
TC-2	Female	Psychological Counsellor	23
TC-3	Female	Science Education Teacher	22
TC-4	Male	Educational Technologist	23

Participants took part in this study in a study office utilizing their personal computers. By following the application guide provided to them, they tested the OptikAR experiment sets. During this process, the researcher conducted observations and took notes. Following the completion of the guides, a semi-structured interview was conducted with each participant to obtain their impressions.

The data gathered from the interviews were transferred without any changes onto interview forms. Content analysis was conducted on this set of qualitative data. Content analysis has been defined as a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding (Berelson, 1952; Krippendorff, 1980; Weber, 1990). The thematic structure required for the data analysis was established based on the research questions. The steps followed by the researcher were as follows (Yıldırım & Simsek, 2005): (a) Establishing a framework for analysis, (b) Analysis of the data based on a thematic framework, (c) Defining the findings, (d) Interpreting the findings. In this regard, a thematic framework was established based on the research questions and theoretical basis of the study. The coding of the data was conducted based on this thematic framework. Data regarding the themes were interpreted through tables and direct excerpts from the related data. The Atlas.ti software was used for the analysis of the findings.

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Table 2: Impressions of prospective teachers regarding the OptikAR application

Impressions of Teacher Candidates	**TC-1**		**TC-2**		**TC-3**		**TC-4**		**TOTAL**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Impressions regarding the application	***9***	***12.16***	***23***	***31.08***	***26***	***35.14***	***16***	***21.62***	***74***	***39.36***
Interesting	3	4.05	4	5.41	7	9.46	5	6.76	19	10.11
Fun	1	1.35	5	6.76	7	9.46	4	5.41	17	9.04
Motivating	1	1.35	9	12.16	5	6.76	1	1.35	16	8.51
Easy to use	3	4.05	3	4.05	5	6.76	2	2.70	13	6.91
Realistic	1	1.35	2	2.70	2	2.70	4	5.41	9	4.79
Impressions regarding learning	***10***	***20.83***	***17***	***35.42***	***9***	***18.75***	***12***	***25.00***	***48***	***25.53***
Eases learning	1	2.08	4	8.33	5	10.42	4	8.33	14	7.45
Allows flexible learning	3	6.25	5	10.42	1	2.08	2	4.17	11	5.85
Provides memorable learning	4	8.33	1	2.08	1	2.08	3	6.25	9	4.79
Increases the will to learn	0	0.00	5	10.42	1	2.08	2	4.17	8	4.26
Materializes the topic	2	4.17	2	4.17	1	2.08	1	2.08	6	3.19
Satisfaction	***10***	***32.26***	***12***	***38.71***	***6***	***19.35***	***3***	***9.68***	***31***	***16.49***
Other Impressions	***3***	***12.00***	***8***	***32.00***	***12***	***48.00***	***2***	***8.00***	***25***	***13.30***
Wishes to use beyond learning	1	4.00	3	12.00	5	20.00	0	0.00	9	4.79
Wishes to use in other courses	1	4.00	2	8.00	5	20.00	0	0.00	8	4.26
Economical	1	4.00	3	12.00	2	8.00	2	8.00	8	4.26
Negative Impressions	***4***	***40.00***	***1***	***10.00***	***3***	***30.00***	***2***	***20.00***	***10***	***5.32***
									188	***100***

Of the impressions gathered from the prospective teachers, 39 % were regarding the application, 26 % were regarding learning, 16 % regarding their satisfaction, 13 % were regarding other matters, and 5 % were regarding negative impressions.

Participants have expressed their opinions regarding the application as interesting (10 %), fun (9 %), motivating (9 %), easy to use (7 %) and realistic (5 %).

TC-3 expressed that indicated that it was the technology itself that they found interesting;

> *"... holding that paper and for it to reflect from there for example surprised me because I well it felt different because I saw something technological. The different environments, it being paper and for the light to do it at that angle when I hold it to the screen, it's strange it feels a little like science fiction it's nice in that respect."*

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Similarly, TC-4 expressed that this experience was different and indicates the point that drew their attention;

> *"'Like it's a different experience. Because at least I feel like I'm doing something. I mean I can feel that I am sending that ray of light with that paper with my own hand like I see it on the screen."*

TC-2 expressed their enjoyment from using the application as

> *"…it was like a collaborative learning environment we did things together."*

while TC-3 indicated that in addition to the entertainment that the application method introduces, it could also supplement learning as follows;

> *"… such methods and visuals may be used to materialize abstract concepts and it would be fun for example, uhh … science is a very boring class in fact and I don't like it and actually I learned it unwillingly but instead of this memorisation system if you could establish it like a game for children the child may think they are playing and learn this"*

however they continue to express their concerns as follows;

> *"Like if it were only for learning purposes they may learn while having fun. If it were like you wanted me to do this task and I had to get a grade at the end I wouldn't want to do it due to that anxiety like right now since I have no anxiety and I'm doing this just for the fun of it I tried to make the best of it…"*

Regarding the motivating qualities of the application, TC-2 states;

> *"This technology surrounded me. In the book everything is based solely on my power of focus but here it pulled me in"*

Regarding the use of the application TC-2 stated that

> *"I don't need any extra information to do this application I can directly adapt."*

indicating no need for technical knowledge and it's ease. Meanwhile TC-3 stated

> *"Perhaps if I weren't using a computer."*

yet continued to state that everyone could easily use it;

> *"Actually… the objects I hold are not really directly related to computer use… it's more about manual dexterity… I mean it seems like everyone can do this."*

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Regarding how realistic the application was TC-3 took into account their previous experiments in a laboratory environment;

> *"The task I was doing was the same there was no difference there regarding learning I could learn the same thing in a lab by holding real light like a flashlight. Regarding learning gains I don't think there is a difference."*

The opinions of prospective teachers regarding learning were; it makes learning easier (7 %), it allows for flexible learning (6 %), it provides memorable learning (5 %), it increases the will to learn (4 %), and it materializes the topic (3 %).

Regarding making learning easier and regarding the flexibility that it provides, TC-1 stated the following;

> *"... it's even better than someone doing it in front of me in person and someone is doing it right there but I might not be able to say can you do this part again but I can repeat it with my own hand."*

Similarly TC-2 described the provided flexibility as

> *"... I learn at my own learning speed. I can skip the parts I want to skip."*

while TC-1 states that in addition to the flexibility allowing them to do things themselves the experience of real experiments are more memorable;

> *"There is some serious flexibility here since I do it myself and this year in optics sorry actually we conducted experiments here at this faculty again but it can't be said that much of it can be remembered. Right now it's better, it can even compete with a real experiment. It is memorable… the most important part is like for example uhh … for example if I had seen a diagram somewhere else or even if I had watched a video maybe it wouldn't have stayed in my mind so seriously but here I can turn it right and left, right now quite most of it is in my mind..."*

TC-2 expresses how despite the fact that the topic is conceptual and abstract, the application materializes it as follows;

> *"One of the applications I used was the physics course like actually they were abstract things actually when I think about it the way they were explained to us was always abstract I got the chance to directly apply them."*

16 % of the teacher candidates expressed their satisfaction through their different and varying experiences. We may gather their expressions that generally they liked the system under this heading. They found the application plain, impressive and creative, and shared their pleasure regarding the fact that the application is accessible through the internet without any setup.

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The will to utilize similar applications in other lessons and beyond the scope of learning along with the economical possibilities that such applications may present were evaluated under the 13 % of other impressions. Regarding the use of similar applications, the science teacher TC-3 stated

> *"Especially it's use in education because for example when I'm a science teacher as a field the children uhh … regarding something about botany or nature when talking about something I can't take them to a museum or a zoology like to a thing every day I can't explain it to them like that."*

which is similar to the statements of TC-2 indicating that transferring this system to learning would be very effective;

> *"… I would want to see it in other classes as well but I can't imagine how it would be applied I can't imagine I would especially want something like this in theoretical courses."*

The participants expressed that they could not currently imagine how this could be implemented. However TC-2 addressed the financial advantages that such applications may provide to education as follows;

> *"For physics, for chemistry with courses in such laboratory environments that are financially expensive or since our schools are so crowded the way that everyone can individually apply the methods would be appropriate."*

TC-4 indicated in their related impressions that merely a computer may be sufficient for this:

> *"For example things we can't do in real life for example this experiment with convex mirrors requires lots of tools and equipment but with this with just one software thing [showing the indicator cards in their hand] the camera computer, internet is enough."*

In addition to these positive impressions of OptikAR from prospective teachers, 5 % expressed negative opinions. These negative opinions consist of the visual, symbolic and textual selections in the user interface design, along with criticisms of the utility of the program and issues regarding the environment in which the study was conducted. In this regard, the following observation of TC-3 regarding the use of the left hand despite not being left handed is an important point that requires more attention in the design process

> *"…but for example a left handed person conducting the optical experiments by approaching from the right might be difficult. Like if I were to use my left hand rather than my right then holding from this side [indicating the marker in their hand] might be difficult for me."*

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The teaching candidate TC-4 expressed an issue faced regarding the unique circumstances regarding the illumination in the environment this study was conducted;

> *"…other than that there was an illumination problem [referring to the room lighting] and I didn't find any other issues. Oh and in some things, probably because of the light, there is a loss of sensitivity in the thing errr ... [pointing to the light ray marker] and I think that is caused by the lighting."*

Generally speaking the impressions of teacher candidates regarding OptikAR may be gathered under these five headings. In addition to the opinions expressed above, various suggestions were made regarding the font, colours and explanations provided in the user interface of the application. Enhancements were made based on these suggestions.

Conclusion

Augmented Reality has the potential to renew our outlook on education by utilizing more of our senses to enhance our knowledge and skills. The lack of trained experts for evaluating educational applications enriched with Augmented Reality places great importance on the opinions and impressions of the end users, in this case, learners. From an educational perspective these inputs support the development of applications utilizing Augmented Reality technology.

Despite the fact that learners found applications enriched with Augmented Reality to be interesting, fun, motivating, easy to use, and realistic, further research into the supplement it provides to learning is required for deeper evaluation. Such applications ease the learning of learners, provide a flexible learning process and economically materialize abstract concepts and topics. Such products which increase the will to learn and provide memorable learning could prove valuable in the learning of children through entertaining education (edutainment). Despite the development of educationally appropriate designs, users have demanded customization options regarding the user interface. Such customization options are an important factor in learner satisfaction

Today we are capable of associating the real world with virtual objects and online multimedia content through a camera and computer. At this point it is important that the real and the virtual are compatible in both position and context to achieve an understandable appearance. As far as the users are concerned, the simplicity and utility of the applications are important. Compatibility of the educational aspects of the applications with daily life scenarios are also paramount to increasing the appeal of the applications.

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Authors

This study is derived from the doctoral thesis that Yasin Ozarslan is currently preparing. The research conducted for this article is original research. This study has been conducted with the expressed knowledge and approval of Mr. Ozarslan's thesis advisor Prof. Dr. Mehmet Kesim and the Anadolu University Social Sciences Institute.

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CASE STUDY: CONSTRUCTION OF 56 INSTRUCTIONAL TV PROGRAMMES FOR ENGLISH LANGUAGE LEARNERS IN TURKEY

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Abstract

During the last 30 months, 56 Instructional TV programmes for an English Language Learning course were scripted in the UK and produced in Turkey. Each TV programme has three drama clips, each one followed by a review of key phrases, then by a section inviting viewers to practice speaking those phrases. The rationale for this structure and for individual techniques within it accords with a comprehensive set of design principles for educational video. In the conference presentation the principles are exemplified with several video clips.

Introduction

For 30 months, from November 2010 to May 2013, several groups of teachers collaborated to construct a series of 56 Instructional TV programmes on English Language Learning for Turkish students. The TV series forms part of a four-semester course, one Language Level per semester, 14 TV per Level. The first cohort of students completed the final semester in June 2103.

The TV programmes were scripted in the UK and produced in Turkey. Cambridge University Press had sold the *Touchstone* self-study materials (Print and CD-ROM) to Anadolu University in Turkey (McCarthy et al., 2011). They also sold Anadolu my services as a Production Consultant for the accompanying TV series. I liaised between Anadolu University (the TV Production Centre and the Languages School) and the UK (the staff in Cambridge and the scriptwriters in Oxford). In the UK we worked on several drafts of the scripts and I adjusted them for multi-camera studio production in Anadolu University. I then reviewed the recordings to catch any errors and to suggest where to make cuts if they were over-length.

The term *Instructional* in the paper's title is used deliberately to distinguish the TV programmes from the general interest videos that are often used by classroom teachers as a resource (e.g. movies or documentary programmes in English). For example the teacher picks a short clip from a movie and then divides the class into pairs, with one group facing the TV and the other with their back to it. Then, after turning off the sound, the teacher begins playing the movie. The person who can see the screen tells the other person, in English, what is happening (Pollard & Hess, 1997). There are many other ways for teachers to use general

interest video as a teaching/learning aide (Ferlazzo & Hull, 2012). In contrast the instructional videos described in this paper are self-study teaching/learning videos, in which the presenters operate as teachers of English Language (Figure 1), who recap and explain the English usage in a series of dramas. The dramas are specially tailored to be source material for the curriculum of the Touchstone course.

Figure 3. Presenters sign off after explaining English usage in the drama clips. (Level 1 of the Course)

Specially tailored dramas for English language teaching TV is an established technique. They were employed in the BBC TV course, *Follow Me* in the late 1970s (BBC World Service, 2013). However, the curriculum tailoring the Anadolu dramas, the Touchstone course, is up-to-date and comprehensive (McCarthy et al., 2011).

The rationale behind the use of broadcast TV

These video are distributed using TV for three main reasons.

- There are many thousands of students studying the course, so sending them DVDs would be expensive.
- Streaming from a website would not be feasible currently. Access to broadband is not high in Turkey, although rapidly improving. Turkey's National Broadband Vision study (2011) found that only 34 % of Turkish homes had a broadband connection compared to the EU average of 61 % in 2010.
- People in Turkey who are not studying the course (not yet anyway) can also see the videos, as well as audiences in neighbouring Turkish speaking countries such as Azerbaijan, Northern Cyprus, Turkmenistan, Kazakhstan, Kyrgyzstan.

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The structure of the TV programmes

Each TV programme has the same structure, shown in Table 1. The main feature is that there are always three dramas, all subtitled in English. After each drama, the studio presenters (Figure 1) speak both English and Turkish to give a Language Review, going through the key phrases of the drama (Figure 2). This is followed by a Language Practice section, inviting the viewers to practice those key phrase (Figure 3).

Table 3: Format of each 20-min TV programme

Section	Description
1	opening
2	Intro, Story so far, Intro Drama #1
3	*Drama #1*
4	*Language Review (key phrases)*
5	*Language Practice*
6	Intro Drama #2
7	*Drama #2*
8	*Language Review (key phrases)*
9	*Language practice*
10	Intro Drama #3
11	*Drama #3*
12	*Language Review (key phrases)*
13	*Language practice*
14	Recap Dramas #1+ #2+ #3
15	Close and Trail
16	Credits

The duration of the dramas totals about 5 minutes on average, and these are repeated in section 14, making 10 minutes. So approximately half of each 20-minute programme is drama, while the other half explains the language in the drama clips.

Figure 2. Language Review section in Level 3: key phrases in yellow

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The principles underpinning the design of the TV programmes

The design of the programmes accords in many ways with the principles in Table 2, which is a précis of the design principles in Koumi (2006).

Table 2: Pedagogic design principles for each chapter of the content

1. Hook a. Shock / surprise / delight b. Fascinate, entertain, appetise, create suspense	**5. Sensitise** a. Consistent style b. Reassure / build confidence c. Conform to video grammar
2. Signpost a. Set the scene / Introduce b. Signpost: what's coming later c. Chapter Heading: what's next? d. Focus: what to look out for (or, to listen out for)	**6. Elucidate** a. Restrain image/audio density and pace b. Enhance legibility/audibility c.. Maximise Cognitive Clarity
3. Facilitate Attentive Viewing a. Pose questions b. Encourage prediction	**7. Reinforce** a. Repetition (with a different angle) b. Re-exemplify c. Compare / Contrast
4. Enable Constructive Learning a. Disclose context, allow discretional attention b. Invent visual metaphors c. Scaffold the construction of knowledge	**8. Consolidate/ Conclude** a. Recapitulate b. Consolidate / Summarise key features c. Chapter Ending

Several of the 23 principles in Table 2 are involved in the main sectional structure of the TV programmes shown in Table 1, while others underpin the individual techniques used within each section.

Design principles behind the main sectional structure (Table 2)

In Section 2 of each TV programme, some short clips are used to remind students of the "Story so far". This *sets the scene* (principle 2a).

The main principle for Language Review section is 8b, *Consolidate/summarise key features.*

Principle 7a. *Repetition from a different angle* also takes place in the Review section. Viewers have already read the subtitles in the preceding drama clip, but now they read them again, with key phrases highlighted (yellow phrases in Figure 2). The *different angle* is the highlighting of key phrases. Another repetition occurs in the Practice section when viewers speak the same key phrases, the different angle in this case being *SPEAKING*, rather than just *LISTENING*.

Design principles for individual techniques in the Language Review sections

An important technique in the Review sections involves principle 2d, *Focus signpost – what to listen out for.* As mentioned above, viewers read the subtitles again, this time with key phrases highlighted (yellow phrases in Figure 2), so they are primed to listen out for and recognise the key phrases spoken once more by the presenters.

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Figure 2 also exemplifies principle 7b. *Re-exemplify* – the same key phrase in several examples.

Figure 3. A Practice section in Level 2 of the Course. Viewers are invited to practice key words and phrases

Design principles behind the individual techniques throughout the programmes

Figure 2 illustrates another design principle that figures throughout the TV programmes, 6b, *Enhance legibility*. During each programme, we switch between shots showing both presenters (Figure 1), e.g. when there is a dialogue between presenters, and shots like Figure 2 of a single presenter. The latter enhances the legibility of the text and of the presenter's mouth when she speaks.

More generally, a pervading principle throughout the series is 1b, *entertain*. The dramas feature three young men and three young women, who live in nearby apartments (à la TV series Friends). There are amusing incidents and, of course, a love interest. Figure 4 shows the two main characters meeting for the first time – they collide in the hall. At the end of the series, they finally confess their love.

Figure 4. The leading characters, Ceren and Brad, just after they collide

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Several Design principles are used in the Language Practice sections

There are many examples in English that involve principle 7b, *Compare*/Contrast – where learners need to contrast different phrases, as in Figure 3.

Another principle, 4a. *Disclose context*, applies to all Language Practice sections. Viewers see a prompt phrase (Figure 5), and they're invited to speak the correct phrase. Then the correct phrase appears on screen (Figure 6). The viewers are therefore being *encouraged to predict* the correct answer (Principle 3b).

Another principles concerns the spatial/temporal relationship between the prompt phrase and the answer phrase. When a text expression on screen changes, the learners need to compare the new text with the old. So, when the new expression appears (Figure 6) the old expression (the prompt phrase) needs to maintain its position on screen– so that learners do not need to rely on their visual memory of the prompt phrase.

Figure 5. Prompt phrase

Figure 6. Prompt phrase does not move when answer phrase appears

Of course, the Language Practice sections follow principle 3a, *Pose Questions*. In general for instructional TV, say one teaching mathematics, the presenter might pose a question and students would be invited to *THINK ABOUT* the answer, or *WRITE IT DOWN* if it was in a video that they could pause. But in this case, they are invited to *SPEAK* the answer.

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Backtracking to the beginning of each Language Practice section, the presenter says *Sıra Sizde,* which means *Your Turn*, while an animated icon is shown, as in Figure 7.

Figure 7. Animated icon, SIRA SİZDE meaning YOUR TURN, at the start of each Practice section

This follows principle 2c, *Chapter Heading*. This is a signpost that tells viewers exactly when the Review section has ended and the Practice section is about to start.

Design principle behind the studio set

Another principle, 5a. *Consistent Style*, is illustrated by the difference in colour between the studio sets in Figures 1 and 3. The TV programmes in the two Figures are in Level 1 and 2 of the Course respectively – and the two colours match the two different sleeves of the printed materials for those two levels (Figure 8).

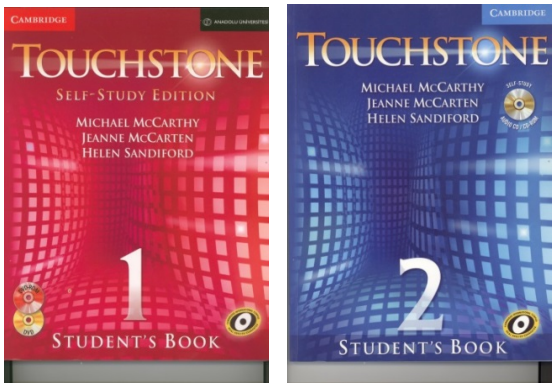

Figure 8. Cover style of printed materials for Levels 1 and 2

The point of this consistency is to make students feel at home when they see the familiar style throughout the semester – they feel comfortable. The principle is under the Sensitise category but what is actually happening for the students is that they are *de-sensitised* to the style of the studio set – they have got used to the set design so they do not get distracted by it.

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Design principles behind section 14, Drama Recap

Returning to Table 1, section 14 of each TV programme is where all three dramas are shown again without gaps. So as with the Revision and Practice sections, the underlying principle is 7a. *Repetition from a different angle*. The *different angle* in this case is the continuous narrative instead of the drama being split into three with interspersed activities.

Section 14 also accords with principle 8b. *Consolidate*, especially because it is always introduced with the advice to "look out for the words and phrases we've just been practicing."

Conclusion

Only 13 of the 23 design principles in Table 2 have been mentioned. However, all 23 design principles played a role in the detailed construction of the TV series. Lack of space prohibits further details, although readers can probably guess where many of the principles would have to apply for successful pedagogy.

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VIRTUAL REPRESENTATIONS IN 3D LEARNING ENVIRONMENTS

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Abstract

This research explores the affordances of virtual worlds to serve as an online collaborative learning place for students by increasing social presence and engagement (Resta & Shonfeld, in Press). Students from Education departments formed Avatars which represented them in collaborative meetings and activities. The research compares Avatars' appearance between students from different countries and cultures. Analysis of observations, questionnaires and interviews examine the ways participants use Avatars to represent themselves. Seeking educational opportunities in technology based learning environments, 3D environments enable learning, which simulates face to face encounters while retaining the advantages of online learning. The study examines the choice of students' Avatar appearance in relation to their appearance and their prevailing social and cultural norms. Does the user's appearance effects his/her Avatar's appearance? Does the user's culture effects his/her choice of Avatar? Do 3D environments blur multicultural differences? Do similarities between students and their Avatars contribute to their learning experience, and if so, in what way? Results indicated that although virtual 3-Dimension environments provide freedom in appearance, external contexts create powerful boundaries and expectations, leading many participants to seek online social acceptable appearance influenced by their cultural norms, as well as by online group identity. This preferable appearance enhanced their learning experience by strengthening their ability to assimilate in the group and to succeed in collaborative group tasks. This study extends the dual-congruity perspectives of Avatar Choice Model (Suh, Kim & Suh, 2011) to a conceptual framework based on quad-congruity perspectives, adding the importance of online group (Martey & Consalvo, 2011) and focus on the constraining effect of offline culture and norms on virtual representations.

Introduction

As broadband Internet access and virtual reality technology rapidly expands, virtual worlds and three-dimensional Avatars are becoming widely adopted (Suh, Kim, Suh, 2011). Therefore, during their studies, pre-service teachers are exposed to virtual teaching environments that are becoming part of our world. This research deals with students from different teacher colleges in Israel and USA participated in a joined course, designed to prepare them for advance teaching environments (Hoter, Shonfeld & Ganayem, 2009; Resta &

Shonfeld, 2012). They were trained to use virtual environments for teaching and learning while getting acquainted with virtual worlds such as *second life* where they were represented by Avatars. They worked in groups, creating educational activities such as role-playing or touring and exploring different countries, museums and archaeological sites (see an example: http://www.youtube.com/watch?v=Tbl7m2gJ7zo&feature=youtu.be). These educational activities were also used in other groups of students from different cultures to study culture, and in other groups of students from different countries (USA-Israel) to study language.

This research examined the contribution of virtual representations of students to their learning experience and to the new teaching opportunities and possibilities. The objectives were to theorize how users form attitudes and intentions regarding Avatars in realistic, task-focused virtual world settings. The research examined learning in 3D online learning environments through the lens of the single user by comparing learners' Avatars and offline appearance, culture and norms of the user. It looked at the similarities between students' appearance in real life and their Avatars. It examined the user's culture effects his/her choice of Avatar and finally it analyzed the contribution of similarity between students and their Avatars to their learning experience.

Second Life (*SL*) and other 3D learning environments are being used in growing numbers. Kibbutzim College, like many other academic institutions, invested resources in that area, including the purchasing of an island in *SL*, upon which virtual Kibbutzim College was constructed. Such an investment requires research, evaluation and supervision of the various components of these environments, in order to estimate their effectiveness on teaching. In this study we hope to promote the understanding of some of the factors that encourage learning in 3D environments and can contribute to the improvement of educational products and encourage further research in this field, in the framework of teacher education.

Literature Review

An Avatar is an electronic image that represents and is manipulated by a computer user as in a computer game (Merriam-Webster, 2012). When students interact with others in 3D Learning Environments, they present themselves by selecting an Avatar. Avatars are often interpreted as symbolic messages about the people they represent and have been found to increase the perceived social potential of an online partner (Barret, 1997; Breazeal, 2003; Reeves & Nass, 1996; Nass & Moon, 2000; Bailenson et al., 2005). As an indication of intelligence and warmth, social potential can, in turn, influence communication outcomes, including attention and learning (DiSalvo & Gemperle, 2003; Galanxhi & Nah, 2007).

Earlier studies related to the arguments of learning advantages by using virtual environments and interactive Avatars, in supporting students' achievement and learning goals within conventional educational contexts. Gaming and Avatar use, ranging from enhanced engagement in learning activities, to more purposeful and focused communication, and better cooperation and collaboration between students when used on group (Falloon, 2010). In addition, Shonfeld, Resta and Yaniv (2011) speak about enhancing engagement and social

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presence by using *SL* environment. Falloon extends these studies and explores the potential of Avatar environments to act as powerful communication mediums for students to display knowledge and understanding, and to engage in the development of higher order thinking skills, such as interpreting, analyzing, evaluating, synthesizing and solving complex problems (Falloon, 2010).

The manner in which users, in a synchronous shared environment, are represented affects their ability to communicate. Therefore, the design of an Avatar affects the communicative possibilities within a virtual world. The visual affects the verbal when both are mediated by technology (Kolko, 1999). That is, people are prone to develop deeper relationships with entities that have greater social potential (Hamilton & Nowak, 2010).

As viewers appraise potential Avatars, they evaluate the extent to which the image communicates intellect, social competence, honesty, and reliability. Viewers desire to know if their image tells them that the entity it represents is credible (Hamilton & Nowak, 2010). Anthropomorphic intensity and realism (or believability) enhances the credibility of an Avatar (Brahnam, 2009). More credible Avatars are more likely to be selected for future interactions (Garau et al., 2003; Nowak & Rauh, 2008; Nowak et al., 2009; Taylor, 2002; Yee et al., 2007).

This study examined the model describing the factors involved in choosing an Avatar. Suh, Kim and Suh (2011) propose a dual-congruity perspectives model: self-congruity (how does my Avatar represent me) and functional congruity (What is the purpose for using the Avatar: roll-playing, dating, etc.). Martey and Consalvo (2011) add the importance of online group perspective. We seek to form a quad-congruity perspectives model by adding a forth factor to that conceptual framework – the constraining effect of offline culture and norms, on which this study focused.

Methodology

Looking at the differences between the Avatars we examined the ways participants use Avatars to present themselves. We looked for similarity between the user's appearance and his/ her Avatar – within a set of possible Avatars in *SL* – while examining the users' culture and norms.

Research Questions

1. Does users' physical appearance affect their Avatar's appearance? In particularly, is there a similarity between students' appearance in real life and their Avatars?
2. Does the user's culture effects his/her choice of Avatar? Does virtual 3D environment blurs multicultural differences?
3. Does similarity between students and their Avatars contributes to their learning experience?

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Study Type

This was descriptive study with mixed-methods quantitative and qualitative, employing observation, interviews, and surveys.

1. Original questionnaire was constructed. The questionnaire enabled us to collect appearance data of students and their Avatars and to answer research question 1 by comparing the appearance data of students with the appearance data of their Avatars. The answer to research question 1 was compared with students' culture to provide an answer to research questions 2-3, and with students' opinion regarding the contribution of similarity between students and their Avatars to their learning, and if so, in what way – to answer research question 4.
2. Interviews (qualitative) helped clarifying unclear data collected in (1) and were compared with its analysis for cross-over checking. We also collected students' opinion regarding the contribution of similarity between students and their Avatars to their learning, and if so, to the way it does so – to answer research question 4.
3. Observation of photos and movies of Avatars (qualitative) – same as (2).

The qualitative tools enabled a deeper analysis of students' opinions relating the research questions. They verified questionnaires data and clarified additional issues that emerged from questionnaires analysis.

Procedure

Undergraduate Israeli students (N=97) from different cultures participated in a pilot research (2011). They were scheduled into 20 themed groups of six members, each from a different college and culture (Hotter, Shonfeld & Ganaim, 2009). Group members collaborated in recording a meeting of the group in a place that suited the group theme which they chose in *Second Life*. The outcome of that pilot created criteria for analyzing Avatars, and revised questionnaires. A similar group of undergraduate Israeli students (N=62) from different cultures (from six Education Colleges – two from each culture: Arab, Secular and religious Jewish) participated in the research (2012).

Israeli graduate students from Kibbutzim College (N=26) and American graduate students from Texas University (N=15) also participate in the research (2012). They were scheduled into ten groups according to members' availability and were strangers to one another offline. They worked in *SL* adjusting or reshaping their Avatar, choosing the colours and texture. Group members collaborated to accomplish a task related to their group subject. Chat, Avatar movement, and use of digital objects such as clothing was recorded and sent to course site – see an example at http://www.youtube.com/watch?v=Tbl7m2gJ7zo&feature=youtu.be.

The students that participated in the study took a survey that measured cultural norms such as being conservative – liberal, similarity to Avatar, demographics, religion, Internet experience, as well as social indicators such as leadership. Questioners, field notes from session observations, interview transcriptions, and session recordings were analyzed qualitatively for

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themes and patterns in participant appearance, use of clothing and accessories, and individual identity cues. Survey results were used to identify participants' offline appearance, race, culture, gender, demographics and provide basic Avatar appearance measures.

Results

Appearance characteristics of students (physical and dressing) were compared with those of their Avatars and were crosschecked by Interviews and questionnaires. We found 100 % similarity for gender, 85 % similarity for skin colour (all white skin colour students chose white skin colour Avatars, half of dark skin colour students chose white skin colour Avatars), 73 % similarity for hair colour, 81 % for dressing style, 92 % for accessories, 69 % for height and weight (31 % chose taller and thinner Avatars).

Most of the subjects (73 %) believe that similarity in appearance characteristics to their Avatars contribute to success in the course and enhance their learning experience. They explain that these similarities, together with a slight improvement in Avatar's height and weight (and skin colour as we found) make them feel better about their Avatars, that is, about themselves in the learning virtual environment. This contributes to their self-confidence and self-esteem in the virtual group. These, in turn, help them to better assimilate in the group, interact with group members, collaborate in course tasks and succeed in the course.

Discussion and Conclusions

Considering all the factors found to be taking part in Avatar choice and in creating appearance, this study extends the dual-congruity perspectives proposed by Suh, Kim and Suh (2011) to a conceptual framework based on quad-congruity perspectives, adding the importance of online group perspective (Martey & Consalvo, 2011) and the constraining effect of offline culture and norms.

Seeking educational opportunities in technology based learning environments, 3D virtual environments enable learning which simulates face to face encounters while retaining the advantages of online learning. The collaboration of students to accomplish teaching and learning tasks which offer new opportunities can be a part of many courses as we demonstrated. Not only gender similarities help the collaboration of group members to accomplish course tasks but also, according to the students' opinions, appearance similarities between them and their Avatars are important factors in devising such learning activities. This is because an Avatar's visual features and behaviour influence social aspects of communication behaviour, including disclosure, nonverbal behaviours, and perceived presence (Bailenson, Yee, Merget & Schroeder, 2006; Bente, Mer & Eschenburg, 2008).

An image chosen by a person as an Avatar promotes stronger relational ties with others. Avatar choice is an important decision for those interested in becoming better connected in online environments. Creating an Avatar not only helps students to interact with others, but as this research shows, according to their opinions, it also contributes to their learning

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experience and online abilities by collaborating with group members, accomplishing tasks, and becoming part of the group.

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PLAY SCHOOL – A SITE FOR PLAY, COLLABORATIVE ENGAGEMENT AND LEARNING

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Abstract

The children's television program *Play School* is approaching 50 years of broadcasting to young Australian children. It is the second longest running children's television program in the world. Based on the original BBC production, *Play School* has been screened across Australia twice each weekday on the national broadcaster since 1966. Contemporary thinking and research in early learning highlights the importance of the early years and family as partners in children's play and learning. This paper outlines results from research investigating the contribution of *Play School* to a healthy start to life for young Australian children, in particular the results pertaining to children's engagement in play and learning as a consequence of viewing the program and the flow on effects to parents as co-players and teachers. The results of the research indicate that key elements of the program support child engagement and parent child interaction that are conducive to learning both during and subsequent to the viewing experience. The results of the study have significant implications for considerations of the key conference theme – Students energised – Enhanced learning experience by participation and collaboration.

Introduction

Young children spend considerable time as viewers of television (Edgar & Edgar, 2008). In fact the Centre for Community Child Health – CCCH in 2009 found that young Australian children spend more time watching television than any other wakeful activity. This study also found that young children increasingly watch television alone without presence of an adult (CCCH, 2009). Such data, as well as increasing concern regarding the impact of increased screen time, the reduction in active social play and increasing rates of obesity on children (CCCH, 2009; Australian Research Alliance for Children and Youth – ARACY, 2010) highlights the importance of quality television for children.

Television for young children has undergone significant change since its first beginnings. Almost fifty years ago television for children involved minimal production in a few locations, a limited screening and small audiences and a focus on child wellbeing. Today television for young children is a global industry which includes multiple viewing opportunities and large viewing audiences and the identification of young children as a highly valued commercial

target audience (Steemers, 2010). *Play School* is an Australian Broadcasting Corporation [ABC] children's television program that has spanned these changes. *Play School* presenters and toys have been inviting young Australian children, aged there to six, to watch, play and learn since 1966.

Play School

Play School is currently screened across Australia twice each weekday on the national channel, on the ABC's children's channel ABC4Kids, and more recently has been made available on line via ABC iView. The *Play School* website notes that more than a million children view *Play School* each week via an interactive website *'The Playground'* which supports the program is also well utilised by Australian children. Results from a survey conducted by the ABC in 2010 (ABC Kids, 2010) indicated that there was a high level of familiarity with ABC *Playground* site with 75 % of the 1010 respondents reporting that they had visited the site with their child. An overview of the nature of the *Play School* television program and the links between the program and play, and learning provide a contextual framework for the research outlined in this paper.

Each series of *Play School* explores an overarching theme selected for the interest to children and for the potential for play and exploration within the playful and child centred focus of the program. Recent themes have included 'Night and Day', 'My Favourite Things', 'Sand and Sea' and 'In the Wild'. "*Play School* seeks to involve the child in active participation during the program and to encourage and stimulate the exploration and enjoyment of the child's own world as a result of experience and ideas presented on the program" (Clark, 1999, p.2). Each of the five programs developed for the series consists of linked segments such as the story, the clock, make and create, toy play, dressing up, songs and large action. Each episode also includes the 'Through the windows' film which is a short film that reflects children's lived experiences in authentic contexts. The content of each segment, the links between segments and the balance of active and passive segments are carefully planned throughout the script development and design process. The aim is to encourage learning through play and interaction across a range of developmental domains such as physical, social, language, perceptual and cognitive development and to support the development of positive dispositions to learning such as curiosity, creativity, and problem solving.

Play, collaborative engagement and learning

The *Play School* approach, like play, is process rather than product oriented and as such focuses on what the child can initiate, create and imagine. Playful approaches are evident in the style of the program delivery as well as the content. The presenters while not child-like are curious and playful. They demonstrate creativity and curiosity and a willingness to solve problems collaboratively. They are innovative in the use of open ended resources and materials, working through difficulties and in re-presenting familiar stories. Familiar toys take on diverse roles in play, become story participants and partners in play and accessible

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resources support the child's participation in the experiences presented in the program. These include recycled materials, household objects and natural resources.

Theoretical Frameworks

A number of theoretical frameworks informed the research including the Developmentalist Paradigm which suggests an age/stage developmental progression for children (Bredekamp & Copple, 1997), and Socio-Constructivist Approaches to learning (Vygostky, 1978; Rogoff, 1998) which asserts that children co-construct knowledge in the social context. Social Cognitive Theory was relevant to the study. This theory suggests that the child viewer is expected to learn from observing others with whom they interact, such as peers and adults, as well as those that operate as behavioural models via the mass media (Bandura, 1986; Li-Vollmer, 2002; Mastro & Stern, 2003; Richert, Robb & Smith, 2011). Ecological Systems Theory (Bronfenbrenner, 1995), which recognises the interactive and complex nature of the various systems that impact on the child's experience, was also influential when considering the cultural and linguistic diversity of the child audience and of the responses of child viewers to the *Play School* program. Ecological Systems Theory proposes that developmental and learning outcomes of children are impacted by a range of influences including biological, psychological and sociological factors within the environmental context. This is also evident in Socio-Cultural Theory (Richert, Robb & Smith, 2011, p.82).

Methods

There were a number of components to the research investigation. These included an online survey, in-depth questionnaire and observations of children watching *Play School* within a preschool setting.

Online Survey

An online survey for parents and/or carers in the home was designed by the researchers based on their knowledge of early childhood education and the *Play School* program. The survey was designed to gather socio-demographic data and to assess a variety of child responses during and after television viewing as well as adult perceptions about individual segments of the program which may prompt desirable responses both during and after viewing. The questions involved seven categorical responses that could be selected as well as an "other" option in which respondents could add further comments. Questions regarding child viewing conditions and socio-demographic details regarding the adult respondents and the child were also included. The survey was accessed via a link on the *Play School* website between June 2010 and December 2010 and during this time a total of 224 respondents completed the survey online. The variables assessed in this particular report were a collection of socio-demographic variables and information relating to child behaviours during and after the programs. SPSS version 18 (SPSS, 2010) was used for the analysis of all the survey data outlined in this report. Frequency counts and means were used to generate descriptive data.

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For group comparisons, when the variables of interest were continuous, t-tests were run and when the variables were categorical, Bivariate Logistic Regression analyses were conducted.

Questionnaire for parents and/or carers

A follow up in-depth questionnaire was provided for a small group of six parents who expressed an interest in providing additional qualitative data and specific examples regarding their child's viewing experience. The questionnaire focused on the nature of the child's viewing experience, the setting in which the program is viewed, how the parents support the child's viewing experience and participation in the program both during and after viewing.

Results and Discussion

Online survey

Results of the online survey are wide ranging and reported elsewhere (See Harrison, van Vliet & Anderson, 2013; van Vliet, Harrison & Anderson, 2012). For the purposes of this paper most pertinent are the results in relation to viewing conditions; child responses during the *Play School* program; and child responses after the *Play School* program and parent/carer perceptions of the benefits of the program. When asked about viewing conditions the respondents indicated that *Play School* was almost exclusively viewed at home with the number of episodes viewed each week ranging from once per week to 28 times per week, and the average of 4 viewings per week. Both morning and afternoon viewing were equally accessed. 33 % of children mostly watched *Play School* alone, 42.4 % with an adult(s), and 25 % mostly watched with other children.

Child responses *during* the viewing of *Play School* are presented in Table 1 and indicate that almost 50 % of children use objects from home in response to the program such as their own toys, recycled materials, or dress-ups. This data suggests a high level of engagement and responsiveness to the program that is manifest in playful responses. Child responses *after* the viewing of *Play School* that were observed by the adult survey respondents are outlined in Table 2 and indicate that almost 50 % of children reported on incorporated *Play School* ideas in play.

Table 1: Child responses during the Play School program (n = 224)

Type of response	**n**	**Percent %**
Watching intently	206	92.0
Singing	138	61.6
Doing the actions to songs and rhymes	163	72.8
Responding to questions asked by presenters	83	37.1
Talking to presenters	33	14.7
Talking to others watching Play School with them	105	46.9
Using objects from home in response to the program e.g., own toys, recycled materials, dress-ups	108	48.2
Other	17	7.6

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Table 2: Child responses after the Play School program (n = 224)

Type of response	n	Percent %
Singing, Play School songs	154	68.8
Asking questions	87	38.8
Making things	94	42.0
Telling stories	67	29.9
Incorporating Play School ideas in play	123	54.9
Incorporating Play School ideas into activities of daily living e.g., cooking, gardening	83	37.1
Other	13	5.8

Questionnaire for Parents and/or Carers

Parent responses to the in-depth questionnaire provided useful qualitative data regarding *Play School's* contribution to children's play and wellbeing. Some examples include:

- "I really love the less than polished *Play School* vibe. I love that my kids perceive it that they can do craft, sing and dance like the presenters because it is ok to make mistakes on *Play School*."
- "I love that they leave in the 'oops moments' and we see presenters recover from these with humour and dignity."
- "I have learnt a lot about how to speak to children from *Play School*."

Conclusion

The results of this research indicate that *Play School*, as a quality television program designed for children, can facilitate opportunities for shared viewing and collaborative relationships. Shared viewing can enable parents and carers at home to observe children's responses to *Play School*, and collaborate in play and learning. Co-viewing adults are valuable role models who can support children to engage in play-filled big action, dancing and singing. As collaborative play and learning relationships develop these also create further opportunities for revisiting ideas derived from *Play School* ideas for later implementation and shared participation in experiences of daily life such as cooking and gardening. The child responses to the playful interactions and the playful approaches to learning modelled by the adult presenters suggest that parents and other family members, who may be unsure of how best to interact with young children, could find a useful model in the presentation style of the presenters on *Play School*.

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CREATIVE LANGUAGE LEARNING IN MOBILE ENVIRONMENTS: ICT SUPPORTED CREATIVITY IN THE LANGO PROJECT

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Overview

Europe is undergoing a set of novel and often challenging demographic, social and economic transformations. In the present circumstances, the impacts of socio-economic change, mobility, adaptability and uncertainty have all contributed to a systemic re-evaluation of the role and purpose of the learning required to participate in communities challenged by a dramatically difficult external environment. Learning is no longer about a linear process of skill acquisition and replication in a stable context. It is also increasingly about the adaptability and flexibility needed to incorporate those identified critical factors which address shared intercultural values as well as creating options for sustained economic expansion in the years ahead. This paper addresses these needs in the framework of innovative learning. This reflects advanced ICT innovation but also the language skills, cultural competence and practical needs of diverse learners in often challenging environments. This paper situates innovative ICT language tool development in the context of a dynamic partnership approach that addresses inclusion, migration and effective integration as part of the language acquisition dynamic.

Even though the European Union would seem to have reached its initial goals of free movement of goods and labour, significant problems persist in regard to the social, political and educational dimensions of public policy in all Member States. These issues have increased in the gravity of their impact. Unemployment, especially youth unemployment, is at unprecedentedly elevated levels. Social and economic inequality has increased exponentially. The incidents of racism and xenophobia have escalated. The impacts of years of crisis and public bankruptcy since 2008 have taken their toll on the shared sense of meaning around the value and purpose of public education. To add to this, learning initiatives around intercultural education and equality are being addressed, if at all, in a fragmented and piecemeal manner. The sheer urgency of fiscal and economic rectification measures means that learning initiatives are not prioritized if they do not relate directly to economic restructuring in a time of austerity and cutback.

Even if some of the thematic areas dealing with access, inclusion, learning and competence development have been neglected, issues around mobility, culture, migration and interculturalism are now critical ones in shaping a renewed set of principles around learning and socio-economic policy in future European priorities.

It is in this new and emerging milieu that multilingualism can be viewed. Language acquisition, skills and confidence are critical components of participatory citizenship. It is no longer the best use of available resources simply to transfer a set of language skills and competence into passive students. It is now more than ever a sustained effort to engage teachers, families, communities, employers and migrants, all as learners, in an enterprise of enjoyable discovery around difference and diversity – of which a second language is a key element, but part of a wider learning trajectory. Apart from the purely linguistic knowledge, LANGO addresses levels of cultural awareness. This is designed to embed cultural information about the countries where the target languages are spoken. LANGO language learning activities are delivered in a calendar format, with each lesson designed per day. This aims to develop the type of mastery which can be achieved in a period of sixty hours of learning by devoting only ten minutes per day during a year: on evaluation, this represents an excellent return for a limited (but consistent) effort.

Developing the LANGO project

Language on the Go (LANGO) is an innovative project funded under the Lifelong Learning Program of the European Union. The project involves six partner organizations in four different European countries (Bulgaria, Cyprus, Ireland and Malta) and has been developed to explore opportunities offered by new and advanced information and communication technologies to encourage learners to acquire, maintain and augment their existing language skills. The project consortium has developed a multilingual language tool that is designed to apply interactive learning approaches and innovative e-learning platforms. These provide computer assisted and mobile assisted language learning within a framework of attractive and easy learning content. The LANGO project has designed this innovative e-learning tool to support individuals engaged in learning four languages: Bulgarian, Maltese, Greek and Russian. The methodology and structure prioritize ease of access and mobility for learners at all points. Clearly, both the methodology and technologies can be used and applied to other languages at later stages.

The design and structure of the language-learning tool aims to support language acquisition primarily by adult learners. From the target groups identified by the project partners, many of these learners have a number of specific learning needs as well as challenges. These include diverse educational backgrounds, levels of literacy, degree of social integration and legal residency or legal/economic migrant status. The LANGO project taps into initial language learning and is designed to be enjoyable and non-intimidating, particularly useful for target populations who may not have engaged in formal learning contexts for some period of time.

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LANGO products and methods focus on what learners typically need or want to say at various stages of the communication process.

The tools integrate technology and use innovative applications. In turn, these do not require advanced computer skills on the part of the learner. The structure and technologies employed thus permit more individualized and independent learning in terms of pace, time and place (home, work or on the move). This framework can therefore engage more readily with learners who have lower formal education levels. This can provide significant benefits in terms of the dual outcomes of supporting improvement of linguistic competence and digital competence at the same time.

The LANGO product offers users a number of elements:

- Introduction to and practice with languages.
- Initial development of communicative skills.
- Easy second language skills inputs through real life communicative situations.
- Entertaining and enjoyable learning activities to enable practice of language patterns.
- Expanding intercultural awareness through language learning.
- Accessible learning platforms through use of mobile technologies.
- Language practice games.
- Facebook/social networking via foreign languages.

The project is structured around delivery of mini-lessons. These mini-lessons, intense but focused, require little effort on the part of learners. They are easy to absorb and assimilate. Learners who use LANGO learn the language literally on the go – at any time and any place on flexible electronic platforms (web-based and iPhone). Moreover, key parts of the motivating learning activities are also designed to be provided via widgets on Facebook.

The end product is a LANGO calendar, which contains 365 days of the year. Thus learning activities cover each day of that year. All lessons are structured in the same way and are consistent and standardized. These lessons include audio introductions, one activity per day from a choice of activities in the template (e.g. matching, multiple choice, etc.) and a daily Wordsearch game. The daily Wordsearch game will also be implemented as widgets on Facebook. Learners need to allocate only 10 minutes every day of the year to acquire, maintain and build upon their language skills. The LANGO project particularly targets language learners participating in EU mobility for study and work, immigrants and other people wishing to develop their language skills in the target languages for personal reasons (cultural interest, friends, business contacts, social participation, etc.) The intended students are adults over the age of 16, and come from a wide range of backgrounds and from many different countries of origin. Many are students and immigrants with a variety of educational backgrounds and varying levels of formal educational level achievement.

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The content is delivered inside specifically designed templates. The program is designed to include different kinds of interactive activities and a game template. These include:

- Multiple choice;
- Multiple choice with media;
- Matching pairs (text or pictures);
- Ordering sequences;
- Media triggers;
- Categorizing different language areas;
- Listening to model, recording and hearing back one's voice;
- Listening to dialogue, choosing a role, record oneself and listening to own recording;
- Wordsearch games based on a sound trigger.

Translation of the introductory part of each lesson – as well as all learner instructions – aims to support learners and increase comprehension. The English language in the LANGO tool is used as a 'lingua franca' to reach out to a great number of learners who may be native speakers of various languages. However, the design of the tool allows for further transferability. In post project exploitation, translations into native languages can easily be integrated and in time could replace the English translation (e.g. on a customer request: thus specific customer-tailored editions of the tool can be produced in the future). Therefore the tool is adaptable, accessible and flexible in meeting current and anticipated learning needs and in adapting to different environments and contexts.

The main focus of LANGO is to foster use of new mobile communication technologies to facilitate non-formal and independent language learning, especially in less widely used languages. LANGO introduces new learning environments aimed not only at using innovative mobile learning platforms but also establishing stable self-learning management on a regular day-to-day basis. LANGO highlights the potential of innovative learning systems to reach specific user needs. It enhances the significance of distance learning in both formal and informal contexts.

Framework and policy

In developing the framework and mobile learning tools involved in the LANGO project, the designers and transnational partners have kept to the forefront the need to work with the needs of specific learning communities so that second language acquisition and learning may create a new matrix of opportunities around integration and inclusion. A key issue has been to incorporate emerging dimensions of innovative learning in international contexts. It has also been to create methodologies that are exciting, enjoyable, relevant and flexible in meeting a wide range of learning needs (in addition to those designed around shared mutual benefit and intercultural encounter). Since it is recognized that the globalization process is at the core of labour market change in all countries, it is also understood that this process has specific implications for learning specialists and educators. This is partly in terms of the speed and

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universal applicability of new and emerging technologies. It is also, however, in terms of the implications for professional training, best practice and standards.

Traditional education and vocational training systems in host countries, for example, pose a set of challenges for migrants who face several layers of difficulty in securing access to both learning and potential employment outcomes. There are, in addition, associated issues around boundaries and expectations for both traditional and new communities. The role of vocational education and training and its part in the construction of competences for meaningful participation in both society and the labour market is further linked to issues around lifelong learning and the ever-developing world of distance learning and technology. As the cost of such technologies diminishes, the only limits become the vision and imagination of the learning community itself. This has immediate implications for how second language learning is designed and delivered, particularly when the languages concerned are minority or lesser spoken languages, themselves often overlooked by mainstream pedagogical approaches and structures.

There are growing numbers of immigrants in adult education programs. The nature of the crisis (and its severe impact on educational resource provision in many countries, especially – but not exclusively – in the Mediterranean region) has produced a disproportionate impact on those attempting to access required language skills for enhanced participation and integration. The pattern is increasingly one of limited resources and limited time to provide quality instruction to learners. In addition, traditional research with adults in non-academic settings has focused more on programmatic issues or examining profiles and models that can be replicated, looking at how adults manipulate their immediate learning needs, rather than the specific measures and techniques by which they acquire a second language. Krashen believes that the ability to obtain comprehensible input may increase with age, giving older learners an advantage over younger ones. People who talk with very young children automatically simplify input and use concrete language, common to restricted codes. Older learners may receive less help and may have to intervene on their own behalf to clarify the input.

A number of factors have been discussed here that may help us understand why language learners seem to have varying degrees of success at different age levels. Cognitive, socio cultural, affective, and input factors all may be a part of the explanation. Research is being actively conducted in these areas, and language educators who keep abreast of this research are more likely to devise effective systems for language teaching that are sensitive to the needs and potential of individual learners. In terms of the LANGO project, this suggests that it is important to understand the context within which language acquisition takes place and the extent to which practitioners ally themselves to cognitive, socio cultural, affective, and input factor explanations for language acquisition.

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Technological Templates

In the following, the reader is able to find the design for each screen for the LANGO Application, with a description for each screen.

Splash Screen: This is the splash screen that the user will see for 5-10 seconds before going to the home screen. This will show the language that the user has downloaded. Given that technically it is impossible to have all 4 languages installed, so in this illustrated case the learner is going to learn Maltese.

Figure 1. Splash Screen

Language Screen: This is the main menu that leads the user to the 365 learning days of the year. The user enters at a certain day of the year and follows the course from that day on during an entire year.

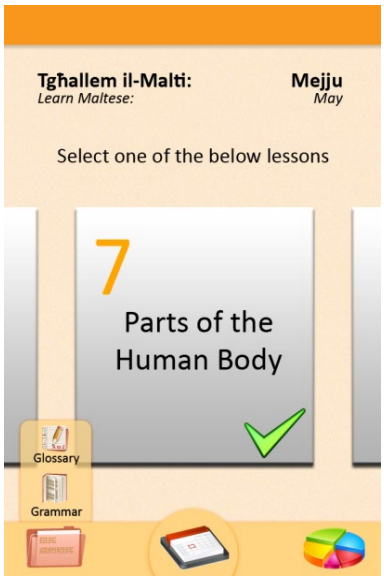

Figure 2. Language Screen

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Word search game: In this game, learners listen to a word and look for it in the word search board. This entertaining way of practising and acquiring a language helps learners retain new vocabulary.

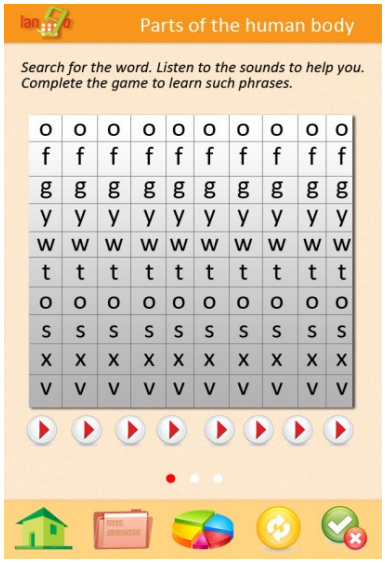

Figure 3. Word search game

Summary Overview: the LANGO tool

In 2009 the European Commission published the *New Framework Strategy for Multilingualism,* the first official communication about multilingualism. Multilingualism is defined as the ability of using more languages and as the coexistence of different linguistic communities in a specific geographic area. In particular, the Framework describes multilingualism as a new sector of European policies devoted to support the full expression of all languages, establishing the right conditions to teaching and learning. The Framework stressed the importance of learning at least two foreign languages from infancy. In 2008, the European Commission published its *Multilingualism, an asset for Europe and a shared commitment*. It proposed an inclusive approach including different sectors: learning, employment, competitiveness, social inclusion, culture, youth, civil society, research and means of communication. The document highlighted the importance of a passive knowledge of languages and of a refinement of learning methods, especially through use of new technologies. The program which has directly promoted multilingualism is the *Lifelong Learning Program.*

A key issue in this LANGO *Needs Analysis* is to locate the methodological analysis within the context of European policy regarding diversity, migration and multiculturalism. Second languages are taught – or not taught – for a variety of reasons at national levels. European policy has been slowly evolving in this context. Apart from declarations of principle, the European Union still does not have executive authority over schools' teaching, curriculum or policy. This is left, under the principle of subsidiarity, to Member States. This masks the fact that multiculturalism and the direct impact of significant levels of migration (both intra-

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European and from third countries) is increasing exponentially in the European Union and is very much a transnational concern.

Teaching a second language therefore becomes part of a broader agenda. Teaching a second language is educationally engaging but also part of a wider strategic orientation that reflects policy towards growing diversity in Europe. Finally, there is the need to ensure that the multilingual aspirations of an emerging Europe are met. While language policy is national, Article 22 of the *Charter of Fundamental Rights of the European Union* recognizes the right to linguistic diversity. The official role of the European Union is to support and promote multilingualism – while responsibility for methods and implementation is left to Member States. The stated goal of LANGO in both technology and pedagogy is to contribute to that policy.

LANGO represents an exciting and dynamic collaboration between partners who addressed technologically advanced elements in design and delivery with a thorough appreciation of the pedagogies of excellence that underpin real transformative learning. The development of innovative learning tools in a mobile advanced ICT supported context will contribute to the achievement of a number of important and critical objectives in the new learning required at this time of crisis and change.

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VIDEO COLLABORATION IN EDUCATION: BUILDING A FOUNDATION FOR THE DIGITAL AGE

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Introduction

It is 4 a.m. in Alaska – not a time when you expect many people, much less teenagers, to be awake. Yet, about 100 eager sophomore world history students are gathered in three high schools spread across the Kenai Peninsula on Alaska's southern edge, excitedly looking at video screens mounted on their classroom walls.

The teens are here to connect with students from the Arab Minority school in Nazareth, Israel. They are joined by students in schools in Louisiana and South Dakota. For an hour, a moderator in Manhattan bounces the conversation back and forth, pinging questions from school to school as the students get to know a little more about each other and the different – and similar – worlds in which they live.

"It was so cool," says Emily Evans, a 16-year-old in Greg Zorbas' world history class at Kenai Central High School. "The students from Israel thought so highly of us because we were from America."

"Now," says Evans, "when the Middle East is a topic in school, it's a lot more interesting. Before it was just, we're reading a book on it and it's not very real to us. But it's real and you can see them and talk to them and see firsthand how it is. Now I pay more attention in history class."[1]

The videoconferencing session Evans and the other students experienced is the type of video communication that is becoming more common in education at all levels around the world, as the walls between classrooms disappear. This Center for Digital Education white paper shows how video collaboration is an essential part of the K-20 education environment that enables cost savings, engages students and creates a more productive learning experience. It prepares students with the skills to thrive in a future workforce that will depend on video collaboration technologies. Indeed, today's video collaboration is rapidly moving from a "nice to have" classroom enhancement to a "must have" necessity.

The shift in the education landscape toward video collaboration is occurring due to a number of factors.

Mobility

Learners are increasingly mobile. Almost two-thirds of students aged 10 to 12 and 90 % of those 14-17 have a cellphone[2], while smartphone usage is at 44 % for high schoolers[3] and 49 % for college students[4]. Tablet computer use is also soaring. Project Tomorrow found 10 % of high schoolers had access to a tablet in 2010, while 2011 Pew Research revealed 12 % of adults aged 18-29 had the devices[5]. These numbers are likely even higher today, given the massive influx of such devices in the market during the past 18 months.

Distance and Blended Learning

Distance and blended learning initiatives continue to grow. In the United States alone, the number of higher education students taking at least one online course in the fall 2010 term surpassed 6 million, with nearly one-third of all higher education students taking at least one online course. Online learning is growing by 10 % annually (compared with 2 percent higher education growth overall)[6].

Bring Your Own Device

At the K-12 level, students are bringing their own devices to school and schools are beginning to allow them to be used in class. This practice, commonly known as "bring your own device" (BYOD), is much more common in higher education, where students are responsible for their own technology; it is a newer concept in the K-12 arena. However, districts that can't afford to provide devices for 1:1 learning are beginning to let students provide their own (and then pursuing a variety of strategies to similarly equip students who do not have them). No hard numbers are available for the number of districts allowing devices (administrative opposition still remains fairly high, according to the Project Tomorrow survey), but a clear majority of parents (up to 70 percent) say they are likely to buy a mobile device for their child to use in school[7].

Increased Access

Video collaboration applications are now available on mobile devices from a variety of vendors and service providers, ranging from no-cost stripped-down models to HD-quality connections with an array of sophisticated service options. Today's technology – coupled with fast broadband Internet – has made fuzzy, unreliable videoconferences a thing of the past.

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Why Video Collaboration is Essential to Education

Video collaboration provides many benefits for learners, faculty, administration and campuses. Among them:

- Classroom experiences and learning opportunities are enhanced. Students have the chance to participate in cross-cultural exchanges, speak other languages, interview subject-matter experts and participate in virtual field trips. Learning becomes more collaborative, personalized, interactive and informal, and is more likely to become inquiry-based, a model that is typically more relevant and meaningful for students.
- Equity in access is achieved for students who are too ill to come to school, live remotely or who are travelling. Campuses can also expand services to current students and alumni by allowing greater student enrolment, increasing access to career services and connecting with alumni no matter where they end up.
- Student achievement is likely to improve. Studies show learners who participate in videoconferencing have higher scores on cognitive indicators and are more motivated to learn not just the material being presented, but also to find out more about related topics[8]. In general, video has been shown to improve learning by up to 400 %[9].[9]
- Instructors have more opportunity to participate in professional development workshops, seminars and collaborative activities when they can do so via video rather than having to take a day or more off to travel to another location. This allows more instructors to take advantage of additional training. Administrators and other personnel similarly can take advantage of continuing education, professional development and other types of meetings, saving campuses money in travel and lodging costs.
- Campuses using BYOD strategies can take advantage of mobile students, instructors, experts and others and bring them together for sessions held off campus. Students on a field trip, for instance, can use mobile video collaboration applications to communicate with each other or their instructors. Students can work on research projects or other fieldwork via video collaboration.
- Distance learning is enhanced by virtual face-to-face encounters, rather than text-only ones. A 2010 meta-analysis by the U.S. Department of Education found that learning that includes both face-to-face and distance elements is the most effective type[10].
- Students can practice skills they will need in the workplace. One survey found that over half – 54 % – of business professionals surveyed in 2010 spoke via videoconference[11]. Video-enabled tablet use also is growing in the business world; Gartner Research reports that 92 % of Fortune 500 companies were testing or deploying tablets in 2011, and by 2015, 90 % of enterprise tablets will be video-enabled, further fostering the use of mobile video collaboration. Gartner estimates that by 2015, 900 million tablets and 982 million smartphones will ship annually[12]. But even sooner – by 2013 – emerging technologies such as HTML5, RTC and SVC will make video collaboration browser-based and inherently mobile.

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Video Collaboration Improving Education around the World

From Alaska to Australia, the Middle East to New York – indeed, throughout the world – video collaboration is enhancing K-20 education. Case studies show a wide variety of uses and benefits for this tool, which increasingly is being used on mobile devices.

Kenai Peninsula Schools, Alaska

As described at the beginning of this paper, three high schools in the Kenai Peninsula in south central Alaska connect with each other via videoconference for world history class, which its teachers have dubbed CWOW, or Classroom Without Walls. The schools not only do this for special events, like the Global Nomads opportunity that paired them with a class in Israel, but also meet on a regular basis. Students spend about a third of their class time in virtual instruction and collaboration. The world history class is team-taught by teachers Greg Zorbas at Kenai Central High School, Gregory Weissenberg at Soldotna High School and Rob Sparks at Skyview High School.

"Video collaboration," says Zorbas, "is absolutely a 21st-century skill – it's really powerful. My sophomores are going to be ahead of the game when it comes to college or doing a job interview via videoconference." Students from the three schools work together in small teams using Google Docs and other shared apps to create current events projects and present them via videoconference. This allows instructors to assess not only their academic work but also their ability to communicate and collaborate via videoconferencing, says Zorbas. They use cellphones to text questions during teacher presentations (which Zorbas found improved engagement even further).

CWOW has helped a student ill with leukaemia continue to attend class from home. Students on vacation have – by request – connected using their mobile devices to their CWOW classroom. "Students haven't wanted to miss my class," says Zorbas.

The teachers have benefited as well, says Zorbas, by seeing how they each teach and by dissecting what worked and what didn't work, helping each other become better teachers. "I've been doing this for 20 years," says Zorbas, "and I've never been more excited about my job."[13]

The Manhattan School of Music (MSM)

MSM is an internationally renowned music conservatory in New York offering bachelor's, master's and doctoral degrees. The school is a video collaboration pioneer, having started using the technology in 1996 to allowing travelling faculty musicians to continue to teach students. The conservatory takes advantage of tools to optimize the reception and transmission of high-fidelity music and, in recent years, has added mobile video collaboration to its repertoire.

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"I'm extremely excited about the revolution of mobility," says Christianne Orto, associate dean and director of recording and distance learning at MSM. "This whole idea of being able to connect anytime and anywhere through a mobile device also gives greater flexibility for our faculty who need to teach at a distance."

Some ways the school uses video collaboration include:

- **Teaching remotely** – Either the instructor or the student or both can now be in locations other than the Manhattan studio. Before mobility, MSM faculty performing around the globe would use partner facilities, such as other universities, to connect to the school's video-enabled distance-learning music studio. Mobile devices now allow anyplace connections.
  Internationally renowned American baritone and distinguished visiting artist/MSM trustee Thomas Hampson, for instance, works with MSM students from wherever he is performing, which could be anywhere in the world. "I can be in Zurich and log into our studio in New York, and I can work very effectively with students," he says.
  Faculty can also mentor students and assess their performance in other locations. For example, a student vocal jazz group at Omaha Central High School in Omaha, Neb., received coaching sessions from composer and conductor Nathan Hetherington, who spoke to them via videoconference from his faculty studio at Manhattan School of Music[14].
- **Remote auditions** – Students have been able to audition remotely on a case-by-case basis (the school is exploring opening this up as an option on a large-scale basis, which would especially benefit its students in Asia and other locations). Auditioning via live videoconference is widely preferred by faculty and students over videotape for reasons of integrity (in other words, there can be no doubt who is singing or playing an instrument, and the sound can't be "doctored"), says Orto.

Today, the school does videoconferencing on a daily basis. "Yesterday we went to Denmark, Monday to Finland, this morning to Nebraska," says Orto. Orto believes that video collaboration is highly essential on a number of levels. "Education is not within four walls anymore. Videoconferencing enables us to connect with peers around the globe. It allows us to develop more highly trained, better prepared musicians. It enables international collaboration. We're really building a global network of professional teaching artists and worldwide learners that is quite exciting."[15]

Wayne-Westland School District, Mich.

Students at the Wayne-Westland School District in Westland, Mich., have used video collaboration to witness live surgical procedures and confer with doctors at a hospital at Ohio State University; shared techniques about the house they were building with students in Texas by walking around the construction site with a video-enabled laptop and wireless card; interviewed authors whose works they were studying; and gone on numerous virtual field trips to museums and zoos.

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Wayne-Westland has had videoconferencing in place for 10 years. Initially, conferences were held at their career-technical centre in an auditorium-styled room that seats 100 and is fitted with five to six voice-controlled cameras. Students, faculty and others who wanted to videoconference travelled to the career technical school in which the auditorium is housed.

Several years ago, the district began using a mobile videoconferencing device borrowed from its local Regional Educational Services Agency. Its use was so great, however, that the district decided to invest in its own mobile equipment. Within the past year, nearly 500 classrooms across the district have been upgraded with short-throw data projectors, audio enhancements and high-definition Web cameras, while the district has adopted a central management system to facilitate videoconferencing on its network. The entire solution was covered by federal grant monies, says Kevin Galbraith, executive director of technology for the district.

"The most surprising challenge of the new technology so far," says Galbraith, "is that teachers find it so easy to set up videoconferences that they are doing it without going through his office first. "which is a nice problem to have," he says. Teachers have been trained on the equipment and lesson integration, and the number of videoconferences, already relatively high for a school district in his region, has soared.

"Last year, we did about 100 videoconferences. This year, within the first semester, we are already close to that," says Galbraith. "It has exceeded our expectations. We expect in the next two years, we could have dozens of concurrent conferences going on every day in the district."

Teachers' imaginations have been sparked as they see new ways to enhance learning via technology. The district also has been able to be creative in how it uses video collaboration for professional development. Now, instead of sending one or two teachers to a conference, says Galbraith, the district is investigating bringing the speaker to the district for a videoconference that all teachers can attend.

"If we're talking about how we have a global economy, thinking your educational experiences have to occur within the four walls of your classroom doesn't match up well," says Galbraith. "We've been able to, with very minimal cost, provide learning experiences we hadn't been able to before."[16]

Other video collaboration examples from around the world include:

- The University of Northern Iowa (UNI) uses mobile devices for student teacher assessment in the field. Assessments or teaching sessions are also recorded for later review. As they address the latest focus on STEM statewide, UNI hosted the Governor's STEM Summit initiative. Attendees participated by videoconferencing and streaming, utilizing mobile devices. The president of one of the community colleges delivered a keynote address remotely from his tablet[17].
- Residents of the Gippsland region in south-eastern Australia learn how to care for cattle via laptop webcam – thanks to a videoconference arrangement that brings trade skills to the remote region. Instructors can work with multiple classes of learners

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remotely, using mobile devices (an instructor can give a hands-on welding lesson while wearing a helmet fitted with webcam on top). This type of visually collaborative learning allows learners to study in fields such as agriculture, construction or engineering without having to leave home, preventing "brain drain" and helping the local economy[18].

- Academic researchers attending a technology conference in Arlington, Va., in 2010 were able to use visual collaboration tools to virtually travel to the proposed Deep Underground Science and Engineering Laboratory – located a mile underground in South Dakota, some 1,500 miles away[19].
- Jimma University in Ethiopia had trouble securing skilled faculty until it leveraged the resources found in other universities in the developing nation. Jimma began connecting to nine other universities via VPN in 2008, allowing for videoconferencing that brought instructors virtually to its students. The technology also enhances distance education for off-campus students[20].

What's on the Horizon?

Already, video communication is moving to the cloud, allowing educational institutions to use this service to more economically and efficiently deliver mobile video collaboration to students, faculty and administrators. Web-based video chats across all segments, including education, are expected to grow 14-fold to more than 140 million by 2015[21].

Consortia make it easier for educational institutions to connect, bring a guaranteed quality of service for video collaboration, and reduce concerns about type of device or network. Service providers will also play an increasing role in the mass deployment of video as a service.

Conclusion

As we have shown in this paper, video collaboration expands the reach of education. Walls mean little; oceans even less. Barriers of time and of place are breaking down, allowing students to learn in much different and more profound ways than ever before. Not only is learning more flexible due to mobile video communication solutions, but it can be eye-opening and life-altering as students experience new worlds, new ideas and new possibilities.

Truly, video collaboration is more than just a "nice to have" technology in education. Today, it is essential to improving student achievement and preparing them as professionals in the global economy.

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THE EFFECT OF MOBILE EDUCATION ON THE SENSE OF OWNERSHIP, MOTIVATION AND JOY IN LEARNING

Jolanta Galecka, Young Digital Planet, Poland

Problems in Middle and High Schools in Poland

Pupils in primary schools often become bored and disengaged during the education process but most of the time they are under a close surveillance from their parents and they are dependent on their guidance as well as the one from their teachers. When the kids move throughout middle and high schools they slowly develop a certain independence and learning in fear of parental disapproval is taken over by learning for the prospects of a better school (university), a better job or ... the learning incentive disappears altogether.

We have visited both middle and high school to talk to the students and the teachers in order to figure out what their current process of learning was and what they would like to change in order to improve it. The final purpose was to design a product that would alleviate some of the stress from the learning process, introduce some fun into it, fit the needs of the students and improve their education. We decided to use a qualitative method first, where the students were divided into small groups of 4 to 5 kids and assigned separate members of our team to talk to them. The discussions were moderated by the researchers who used a fore designed scenario. Such an approach gave the opportunity to see the spontaneous reactions and behaviours of the respondents as well as the stimulating influence of the group processes on their perceptive abilities. Each group was presented with a set of 22 questions regarding their learning habits, the purpose of learning, motivation, difficulties, things to change, desires and eventually several layouts of the course design and a set of add-ons to choose from.[1]

We have recorded all the discussions in order not to lose the details and precious comments of the respondents. We were somehow surprised by the vagueness of their expectations at the initial questioning. But when presented with the choice of possibilities they were very articulate about what they wanted as well as at motivating why they wanted a certain feature or layout.

We have found out that homework is a growing burden: students in middle school reported spending 1 to 3 hours per day, whereas the high school students were spending 2 to 4.5 hours per day revising the information or preparing for the next day. Additional after curriculum activities also fill up their schedules but the students see them as necessary as the school is not providing all the needed instruction[2]. Only very few were able to practice their interests and

pleasures. The students were mostly using textbooks as the main resource for learning with the high school students using multiple number of them for each subject to check multiple perspectives. The Internet is a rare source of knowledge. First because it is deemed unreliable and second because the students do not like being chained to a desk. Only few of the students had tablets or smartphones and they reported using computers for learning as not very convenient as it brought distractions and was often noisy (?!). Also students' own notes were very useful and highly valued.

The biggest problem communicated to the researchers was the concentration. Most of the school subjects require a different approach, yet the resources are all very similar and demand a lot of reading which is often hard to concentrate on. The students reported making lots of breaks and trying to find the best environment for learning: with music or without it, on the bed or at the desk, with food or without it, etc. The older students claimed they already knew how to learn. All of the students found rote learning difficult and unattractive. The hardest to learn were dates and definitions.

Asked whether they preferred solitary learning from a collaborative one, the students admitted that due to the lack of time and different schedules of each of the students, they were mostly basing themselves on a single learning. Though they said they often tried to collaborate before tests to verify their knowledge and check one another. A class Facebook account was used to exchange information about homework, due dates and other notifications. They would also scan their notes and pass them to their colleagues in need.

Solutions that could solve some of the problems and ease the learning process

When asked if they could imagine a perfect tool or resource for education, for their learning, the students answered that they would like to have one device where they could keep both, the notes as well as the textbooks or other scientific articles. The device would need to be portable, easily searchable and editable also allowing note taking. While at the topic they mused about more freedom and more reliable resources that would cover the subject from multiple perspectives. They also wanted more relevance to the outside world. Most of the students gave parental and teacher's approval as the reason for studying, good grades and – in high school – better university and also inner motivation of following one's passion or interest.[3]

Graphic design of the resources and why it matters to the students

The participants were shown six graphic designs of the basic layouts of the learning activities. They were given a separate questionnaire and were asked to put the designs in order from the most liked to the least one. Additionally they were asked to explain the reasons behind the choice of the best and the worst draft. The students were actually looking at the designs on the tablets to see them in their native environment.

The students revealed a strong dislike towards white colour (the reason being that everything at school was white from books, through copybooks to tests and homework) which they associated with boredom. Empty space as well as white colour was deemed unattractive. The

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students mentioned that when there was a lot of text it was very difficult to concentrate and to learn from it. You had to pause, the text blended together, it was difficult to concentrate and it was discouraging. It was much easier when there were photos or simulations that showed you how something worked or looked in reality.

The designs that were chosen were praised for cheerful graphics. According to the students' opinions colour creates an impression that there is less text. It also facilitates remembering. The divisions used in our designs made the text friendlier and seemingly easier to learn from. The image used in the design was clear and drew attention. The students underlined the need for colours and clarity, the background should not be distracting but cheerful, encouraging. Bleak colours were deemed insipid and discouraging. They wanted divisions and were looking for separate chunks of information and easily-readable texts. The design of the text should be such to make impression that there isn't too much of it to read. Good arrangement of the text was highly praised.

Helpful features that could change students' attitude towards learning

The subjects were also asked about additional features that could help in their learning. The aim for the add-ons was to provide functional tools that would support the students in the learning process and make the process more attractive enriching the content.

Each of the students was asked to rate the presented add-ons in two categories: according to their usability and attractiveness (fun). Before filling the questionnaire the researcher explained the purpose of each suggested add-on. Later on the students were asked to make their own suggestions, not included in our proposal.

The suggested and explained add-ons contained the following options:

- Flashcards – enabling a student putting any fragment of the text as a definition, as a separate note, to have later for repetition.
- Highlighter – enabling a selection of text with a different colour.
- Search – enabling looking inside any part of text for keywords.
- 3D Animations – available for each subject as a separate function.
- Search-Link – enabling a direct transfer of the chosen phrase to search within Wikipedia or Google.
- Bookmarks – enabling adding particular pages to a separate folder easily accessible at any time.
- Why-do-I-need-it – a special feature explaining the application of the described problem in the real life.
- Progress bar – graphically showing where the student currently is within the lesson.
- Personalization of the layout – enabling a choice between certain layouts that could be adjusted according to the sex preferences or the subject characteristics.

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- Stress reliever – a separate activity that could be played anytime allowing the student to relax by stroking an animal, pressing bubbles in a bubble foil or "damaging" the screen of the mobile device.
- Game – a simple game that would take the mind off the lesson.
- Music synchronizing the brain hemispheres - where the learner can choose between several different musical pieces.
- Speech synthesizer – synchronizing the text with speech (Ivona) giving the learner a chance to listen to all the textbook texts.

Search, Bookmarks, Highlighter, Flashcards and Search-Link were chosen as the most usable and 3D Animations, Flashcards, Highlighter, Search-Link and Why-do-I-need-it as the most attractive.

The additional ideas the students had included:

- Recorded and written notes – allowing for individual note making within each activity.
- Greying out (brightening up) the parts of information that the student "absorbed" to differentiate them from those that must be learnt.
- Position marker – an option to see the position of the student within the entire course.
- Calendar – allowing the possibility to plan the learning process.
- Math Tools, e.g.: ruler, protractor.
- Editing option – enabling student's editing inside each lesson.

We have implemented many of the requested features: like progress bar, additionally showing all the results, the places visited by the student and suggestions regarding future learning also enabling students to track, store and report their progress and results. Detailed content enabling an immediate jump to a chosen subject. Highlights, notes and a choice of graphic layouts, since we discovered how important the colours were to students.

Nevertheless it is worth noting that two most popular features among students were flashcards and highlighter. What is really interesting here is that the research shows those are pretty ineffective tools for learning purposes. Why? Because they promote rote learning, not elaboration. Much more effective than repeating a highlighted phrase is to try and remember it, think about it, visualise it or simply ask each other questions.

Why do students use it so often then? Because this is what is still most popular technique at schools. And with printed materials this is not surprising as you cannot do much more than that (sometimes you cannot do even that when the book does not belong to you, so many students learnt to use pencils).

When we were talking to students we have picked up on one more habit that they have trained themselves almost unconsciously to. When working with written printed materials that provided both introduction, solution and the testing in the same format (mostly written words and algorithms), the students learnt to pick up on certain patterns which they would later on reproduce at answering the questions. Like following a certain rule in solving the

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algorithms or rewriting a passage from the text as an answer to a question. Such an approach does not build thinking skills. It only requires association and repetition. Such learning will never teach the students how to apply the learnt knowledge to a new problem. In order to achieve that we needed to employ a multimodal approach.

Multimedia

With multimodal inputs such tricks, as described above, are impossible: the learner needs to think, draw conclusions, compare different information coming from: simulations, animations, videos and slide shows, which are combined with different types of tests like filling the gaps, connecting elements or choosing the correct answer requiring your understanding of the process or information.

We are all driven to multisensory experiences. It is natural. Our sensory processes are wired to work together. The brain processes incredible amounts of sensory information simultaneously. All the information is then integrated assembling all the signals in order for us to perceive a particular situation, information or event. Our ancestors developed in a multisensory world. Our brain developed with a lot of visual stimuli important for our survival.

Different sensory inputs influence each other. Stimulating several senses at once improves learning. It is called a multimodal reinforcement. So learning can be optimized this way, by employing more sensory inputs. Combining sight and sound increases the learning process. Adding touch to visual stimuli increases the recognition. And vision seems to be the strongest sense. The more visual the input, the more likely it will be remembered.

And mobile technology adds touch to sight and hearing.

Why it needs to be mobile

As it turned out the students navigate through mobile devices with great ease. More importantly they enjoy the process very much. When asked where they would use it, they gave all sorts of places as examples, including: a bus, a queue, a break at school or a park. Tablets are perceived as great toys which makes the learning seem friendlier when done on this type of a device. They are comfortable and allow a choice of learning environment. Of course the price constitutes a certain barrier but hopefully not for long.

Our application is designed to take advantage of the 3-R's of mobile learning: Review-Refresh-Reinforce. Learning with mobile devices has been proved to be more effective if short lessons are to be practiced (review), if it is used to highlight important points (refresh) and test learning recollection (reinforce).

Mobile technology is rapidly growing and becomes ubiquitous. One reason to think of is our mobile nature. We have evolved on the go, always moving, changing places, adapting to new environment. Our brain was developing with a lot of movement, always on the lookout,

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always searching for patterns, always solving problems. Mobile learning is comfortable, adjusted to human perception and enables interactivity. Instant feedback helps students to identify the right answer to any question they failed to answer correctly and increases motivation and engagement. Immediate tests at the end of the lessons together with immediate progress reports enable prompt verification of the level of understanding which really helps.

Anytime anywhere learning is more than just freedom of choice it also gives a power to choose, to decide, to determine key aspects of learning. It makes learning more relevant as it can be studied when needed. And choice is an important factor for attention. Attention is crucial for engagement and retention. Since the device is personal and hand-held (or not even that) and usually customized (with apps and content), the learning feels more personal than in a book.

Mobile devices provide a consistent learning experience: a student can access the same educational resources from anywhere. They make it easier for students to complete homework and keep up with the curriculum even when their education takes place across multiple locations. The device can be used for fun as well as for learning and this encourages feeling of ownership which increases willingness to use the device. For many students the use of mobile devices is inherently exciting, motivating and can build confidence considerably improving their performance when structured properly.

Usability

Later on, when the project was being developed, we have set up a Facebook account to keep in touch with all the research participants. Then, when the prototype was ready, we met again and tested the product's usability to see how it felt to the users, how friendly it was designed and whether there was anything else that we should have thought about. After playing with the application, the students were handed questionnaires containing twenty questions (closed questions, multiple choice and open questions).

As it turned out not many students have used mobile technology for learning purposes. For testing usability this situation was even better for us as we wanted to know whether our application was user friendly, whether it was intuitive to navigate through, whether the students would know what the purpose of specific buttons was.

Certain icons turned out not to be intuitive and the students could not figure out what they were for at a glance. It was enough to press them once though (which they did without any hesitation) to find that out and remember it for the rest of the application.

What was really praised were the multimedia. The animations, the videos and the simulations were said to change the whole perspective on learning. They differentiated the whole process, made it more fun and much more comprehensible. They were an awaited break from the boring textbooks.

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Methodology, Fun and Engagement – Conclusions

The last step of the research was the quantitative stage, where we have designed a certain list of questions and sent out via email to see which technology is the most awaited among students and to learn their expectations towards it. We also wanted to know the scale of the needs considering the school subjects that were desired.

As it turned out the most important for the students was the chance of having everything in one place with multimedia that would enable a better association of the information and better elaboration. The students underlined the need for all the subjects, not just STEM. At the same time they worried about their reliability as – so far – the digital products are usually colourful but do not carry much educational meaning or are very random and fragmentary.

So our solution is curriculum based, complete and includes everything that is necessary for revising knowledge on Science and Maths, Humanities, Geography and soon will include Art, Music and Business Studies. It is methodologically reliable because it is based on one of the leading educational publishers' materials.

And we have applied many of the gaming aspects as well. The units are short and engaging, the challenge is progressing with the raising mastery of the learner, the feedback is instantaneous and the activities are interesting which makes them easier to learn and remember. Fun needs to be an integral part of learning.

When designing the application we researched the brain biology as well. Each brain encodes information in a different way and stores it in different places. But what is important here is that the actual encoding of information rarely takes place when you're hunched over a desk at school with a pen and paper, for 45 minutes in a row. Why? Because brain needs time to digest the information (it needs breaks), our brain is very social so it needs communication with other 'human brains', it needs multimodal inputs. And it needs elaboration to encode the information in long-term memory. The information needs to be repeated. Repetition strengthens the connections between neurons and builds neuron clusters. The repetitions shouldn't be crammed into one big lump, but rather spaced (in intervals) over certain amount of time (neurons need to be fed with information (impulses) to keep firing) to strengthen the synaptic consolidation. And again mobile devices provide a wonderful opportunity to do exactly this.

But it is not enough to go over your notes and read them again. The best way to enhance memory is to elaborate the information, to work on it from different angles, to personalize it. The learner needs to focus on the meaning of the information and the best way to make learning understandable is to provide real-world examples. Real-world examples take advantage of what the brain loves to do and does really well – making patterns and matching them. Memory is enhanced by associations: when the new information can be embedded into an old one, or if there is a pattern in it. It all improves the retention and retrieval.

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Another effective method is to provide an introduction that provides the gist of the information. The more compelling the introduction, the better the retention. Why? Because it seems that the memories are stored in the same place that were recruited for learning it the first time.

For the encoding to happen in the first place attention is crucial. Attention is tightly connected to interest. Our choice of the material, time and place increase attention. That is why providing the students some choice over the learning process improves the outcome.

As the research shows the environment can enhance the learning process greatly. The best learning occurs when the environment is comfortable and not stressful. Mobile learning enables the choice of the learning environment therefore provides a better chance for the enhancement to occur.

Maybe in the future the schools will be able to accommodate students' changing needs and rhythms. Maybe the kids will be given more time to speak their mind, more time to absorb the gained knowledge. Maybe the arts will be integrated into every curriculum, not as an auxiliary addition, but as a core of learning. Our application is just one of many steps towards that direction.

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[1] Details will be provided at the presentation, including the questionnaire, the suggested add-ons and the pictures of the layouts presented.
[2] The schools we chose are regarded as ones of the best in the area and the students are quite ambitious as well.
[3] Though the passions and interests were often followed at the after curriculum activities.

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MOBILE DEVICES AS INNOVATIVE RESOURCE IN THE UNIVERSITY LEARNING EXPERIENCE

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Summary

The concept of ubiquity brings a deep technological convergence among various devices that make it possible, and the coexistence of what is real and what virtual. This is also creating changes in how we learn and also how we teach as well as the teaching resources we create. We focused on these three facts in today's global society under the Spanish Group research EDU2010-17420 Sub EDUC 2011-2014: *Ubiquitous Learning with mobile devices: design and development of a competence map in higher educatio*n. The ultimate goal is to create a standardized competence model valid to be used by different agents and in different scenarios. Mobile devices represent an innovative alternative that can support potentially an improvement in the teaching-learning processes. As objectives we document and analyze the state of the question on ubiquitous learning environments in Higher Education based on the use of laptop, smart phone, e-books and consoles. The total sample involved 461 students. The frequency of use of the diverse devices as learning tools was: Laptop 61.4 %; Smart Phones 29.3 %; E-book 11.5 %; Console 12.1 %.

The data and reference texts analyzed refer specific features of mobile devices for educational purposes such as portability, small size and weight of the device, social interaction, collaboration and data sharing with other users, context sensitivity, connectivity, individuality, expansiveness. Regarding the construction of knowledge, students express greater motivation and interest in learning; mobile devices ease interaction between pupil-teacher, teacher-student and among learners and teachers. Likewise, they realized the development of autonomy in the learning process and their self-regulation.

In absence of standardized models to guide instructional design with mobile devices it is of particular interest to analyse the trends of the development of mobile technologies subject to be used in ubiquity scenarios. No doubt, the ubiquitous learning shapes a new educational paradigm that arises from stems from new media technology with mobile devices. This learning provides other means of interaction and access to a wide range of contents. In this embodiment, students can extend the benefits of classroom education and enhance their academic development accessing, via mobile devices, online courses, audio and video lectures,

podcasts, intercommunication with peers and teachers, rating scores consultations among other resources.

After analyzing the results, we can conclude that it is strictly necessary to test new models of innovative learning activities concerning dimensions of site, time and space and also consider topics such as: Lifelong learning, reflection and involvement in curricular learning processes, integration of mobile device technology in all levels of education to connect students and professors from universities around the world in a seamless community web.

Theoretical Basis

The teaching-learning processes have undergone lately deep changes, both in their approach and in the way they are implemented (Leví Orta & Ramos Méndez, 2012, p.26). Knowledge is no longer associated exclusively to specific physical spaces, people can even hold their own pace of work with learning interests. Anyone can create and design his own conception of knowledge and spread it.

The research for the year 2012 that annually perform the ARD/ZDF services, concluded that mobile terminals, especially tablets and smart phones in Germany underwent a great development mainly due to new situations where they can be used, the new behaviours of the users, the new solutions available, new software with easier access to the network, and to multiple content (Eimeren & Frees, 2012, p.362). The extraordinary development of the digital devices recently makes the ubiquitous learning no longer just an option but an imperative social practice (Cope & Kalantzis, 2009). Furthermore, Spanhel (2006, p.85) focused on the anthropological dimension the correlation of learning between opportunities, desires and capabilities in the development of competition for self-organization and autonomy in the learning process. This implies formation and training to educate students about the possibilities of mobile devices and the choices of content and relevant strategies, when it comes to ubiquitous learning. The evolution of mobile devices has been universal and speedy, nevertheless has barely allowed reflect upon the possibilities in education. Currently these resources multiply its applications. The development of this technology opens up many possibilities in education; it also encourages socializing and inclusive actions for people with special needs. Training now requires specific attention to acquiring the necessary knowledge to make decisions on the use of objects and technological processes. (Vázquez Cano, Sevillano García, Méndez Pérez, 2011, p.183). It is necessary to solve related problems and must use them to increase the capacity of knowing how to act and use them in seeking and achieving better learning. We believe that the current processes of transformation can be characterized by a shift to a new paradigm of collaborative learning, connective and heterarchical. This major paradigm shift requires profound changes. From the student's perspective, the key factors for innovation in education will be the need for competition, and deploy mobility needs for a global higher education to global not bounded to borders.

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Fernando Santamaría (2010) presents ubiquitous learning scenarios as asynchronous (anytime, anywhere) and available in a range of different models of providing learning. These include courses, workshops, short and long-term commitments, ad hoc groups, international study panels as well as traditional lectures, seminars and classes. There is a direct relationship between the idea of ubiquitous learning and the power of mobile devices to provide highly interconnected educational environments. Latest research indicate that learning anywhere is equivalent of some sort of simple mobile learning (Hwang, Kuo, Yin & Chuang, 2010). Mobile learning is a field of research and educational practice rapidly expanding. However, there is still little theoretical and conceptual work to explain the complex relationship between the features of the rapid technological change at times revolutionary, its education and learning potential as well as its integration into the users´ daily lives. In this research we chose the socio-cultural ecology framework (Pachler, Bachmair & Cook, 2010) to investigate these elements.

Research Design

The ultimate goal is to create a standardized competence model valid to be used by different agents and in different scenario. Mobile devices (laptop, smart phone, e-book, console), represent an innovative alternative that can support potentially an improvement in the teaching-learning processes. The intersection of online education and mobile devices is known as ubiquitous mobile learning. We will focus in this part of the study on the five devices listed.

Objectives

1. Analyze learning practices with laptop, smart phone, e-book, console that take place in Higher Education environments.
2. Determine new techniques and ways for acquiring knowledge, skills and competencies with these devices in its various forms.
3. Document the state of the question on ubiquitous learning environments in Higher Education based on the use of laptop, smart phone, e-book, consoles.
4. Analyzed from a quantitative and qualitative point of view, profits and activities that students carry out with laptop, smart phone, e-book, console in Higher Education contexts where the action occurs.

Methodology

Due the nature of the hypothesis and research objectives it was necessary to conduct a mixed research methodology, using techniques with varying structuring degrees, ranging from quantitative to qualitative. The experimental aspect of the project focused on the research design where the following main techniques were used: survey questionnaires, in depth interviews.

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Data processing

Reading and analyzing of protocols allowed us some reality and some novel concepts, specialized and innovative. The impacts were grouped by modalities and variants. This vision lead to develop a category prototype that would allow us to differentiate within the learning macro concept, explanatory and clarifying subcategories of the main category, learning research priority therefore, we consider appropriate to call them: Reasons students have to search learning, activities that complement learning and become part of strategies, profits and procedural knowledge and procedural knowledge benefits obtained and places of use. Keeping in mind always the key terms, of identity and situation evidencing the comprehensive and existential context obtained.

Results

The sample includes 461 students: 94.3 % are college students, 5.7 % other levels. The frequency of use of the diverse devices as learning tools was: laptop 61.4 %; smart phone 29.3 %; e-book 11.5 %; console 12.1 %. Table 1 shows the most frequent terms, ordered by the TFIDF coefficient, found in the narratives using the software Wordstat 6.1.7 (Provalis Research, Montreal, Canada).

Table 1: Terms most frequently found in the narratives, specifying the number of occurrences (TF), the number of respondents that cited, ordered by the importance given by the coefficient TF IDF

	Term frequency (TF)	Num. respondents	% Respondents	TF – IDF
Mobile phone	190	114	24.7 %	115.3
Ubiquitous learning	121	53	11.5 %	113.7
Laptop	197	124	26.9 %	112.3
Mobile devices	149	97	21.0 %	100.9
Anywhere	191	153	33.2 %	91.5
Any time	154	121	25.3 %	89.5
Internet access	163	144	31.2 %	82.4
Information search	112	102	22.1 %	73.4
New technologies	97	72	15.6 %	78.2
Do homework	82	67	14.5 %	68.7
Taking notes in class	66	45	9.8 %	66.7
Social networks	80	67	14.5 %	67.0
Anything	72	62	13.4 %	62.7
Touch screen	43	29	6.3 %	51.7
Digital camera	43	31	6.7 %	50.4
Resolve doubts	42	38	8.2 %	45.5
e-mail	40	37	8.0 %	43.8
Smart phone	31	24	5.2 %	39.8
Type of learning	23	15	3.3 %	34.2
Hear music	26	23	5.0 %	33.9
Virtual campus	27	26	5.6 %	33.7
Tablet PC	23	17	3.7 %	33.0
Type of information	24	21	4.6 %	32.2
Learning to use	23	21	4.6 %	30.9
Real time	20	15	3.3 %	29.8
Leisure	20	16	3.5 %	29.2
Speed	22	22	4.8 %	29.1
Daily life	20	18	3.9 %	28.2
Know the basics	20	20	4.3 %	27.3

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Tables 2-5 show the main profit engaged and the undertaken activities that can be identified in the narratives, for each one of devices considered.

Table 2: Laptop

Profit engaged	Undertaken activities
Help to work. Storing information more easily from anywhere. Lightweight and can be taken anywhere. Make timely consultations. Access to specific forums, to topic of interest. Attend on-line events or participate in courses.	Rearranging notes. Make drafts. Accomplish group activities. Twitter and Facebook updates. Watch movies, play video games. Educational material storage.

Table 3: Smart phone

Profit engaged	Undertaken activities
Develop coordination skills and logic. Search technical terms for the career. Games like Brain. Training for exercising memory, numeracy and other skills.	Read online newspapers. Arrange meetings with partners when working together. Search words that are not understood.

Table 4: E-book

Profit engaged	Undertaken activities
Read books we could not buy due their excessive prices. Access to major selling e-book portals. Download electronic editions of newspapers or magazines.	Check doubts. Take and save notes in class. Read books with comfort.

Table 5: Console

Profit engaged	Undertaken activities
You can learn motor skills	Playfully learning through educational games. Quiz games. Games to exercise the mind, educational games.

Discussion

At first sight, researchers were surprised of the data related to frequency recorded to laptop, nevertheless reviewing the process accuracy is found. With no specific data in the article, but providing trends (Martin 2013: 52) we find that the computer loses internet access. In 2006, Siemens proposed a list of the necessary competences needed for the proper digital literacy of new apprentices and for the right use of mobile devices: Attachment, filtering, connection, personal condition extension, production and retrieval of meaning, evaluation and validation, alteration of the validation processes, critical and creative thinking, pattern recognition,

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recognizing, browse recognizing knowledge, acceptance of uncertainty and contextualization. All these characteristics were given in the texts analyzed, for example: Stay focused on the important tasks although sometimes distractions appear, extraction and management of important elements from the constant flow of information rather than knowledge, establishment of networks, interaction to create social environments, determine the value of knowledge and guarantee authenticity, validation of people and ideas within an appropriate context, browse within repositories, balance between what is known and unknown, understanding the importance of the context in which the action unfolds. Following this research and the analysis thereafter, it can be stated that they do comply. Naismith et al. (2004) also mention specific characteristics of mobile devices for educational purposes such as portability, small size and weight of the device, social interaction, collaboration and data sharing with other users, context sensitivity, gathering and responding to real or simulated data locally environmentally and temporarily; connectivity, selfhood, expansiveness. This has been verified in the devices tested. The same is true on matters related to the construction of knowledge, greater motivation and interest in learning, facilitates student-teacher interaction, It also enables the development of autonomy in the process of learning and self-regulation.

Conclusions

There is a need to experience new models of innovative learning activities concerning dimensions of site, time and space and also consider topics such as: Lifelong learning, reflection and involvement in the curricular learning processes, in their learning schedule throughout life, adoption of ICT in all levels of education, an approach to connect students and professors from universities around the world in a seamless community web. Despite the validity of these indicators obtained in several empirical studies, reviewing the scientific literature, there are still no proposals to standards that could be used as basis for the design of digital educational plans. In the absence of models to guide instructional design, it is particularly interesting to be considered in the process of documenting learning sequences and to analyze the trends of the development of mobile technologies that can be used in ubiquitous situations.

Without doubt, the ubiquitous learning forms a new educational paradigm that arises as a result of new technological means for mobile devices. This learning provides other means of interaction and access to a wide range of contents. In this embodiment, students can extend the benefits of classroom education and enhance their academic development accessing, via mobile devices, online courses, audio and video lectures, podcasts, intercommunication with peers and teachers, rating scores consultations among other resources.

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Note

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INTERACTION EQUIVALENCY IN THE OER AND INFORMAL LEARNING ERA

Terumi Miyazoe, Tokyo Denki University, Japan, Terry Anderson, Athabasca University, Canada

Introduction

This paper aims to clarify issues and challenges that the field of education has encountered in the context of OER (Open Educational Resources) and increased emphasis on informal learning (Eraut, 2004). It is guided by insights from the Interaction Equivalency Theorem (the EQuiv) posited by the second author (Anderson, 2003). In the paper, we first provide an overview of the core concepts of the EQuiv. Next, we explain how the EQuiv framework can be used to analyze interaction designs for online and distance education. Furthermore, relying on the functionality of the EQuiv, the paper examines the major issues formal education is confronting due to the ever-growing availability of OER and informal learning opportunities they create (Anderson & McGeal, 2012). In conclusion, this paper explores the changing role of formal education in the new era of learning where online educational resources and opportunities are readily accessible and in many cases completely free of cost to the learner.

Interaction Equivalency Theorem

Definitions and Concepts

The Interaction Equivalency Theorem (the EQuiv) was originally posited by Anderson (2003). In this paper the definition of interaction provided by Wagner (1994) is used, which is the one Anderson adapted to develop his interaction arguments. That is, interactions are "reciprocal events that require at least two objects and two actions. Interactions occur when these objects and events mutually influence each other" (p.8).

Historically, the "Three Types of Interaction" model (Moore, 1989) was the first systematic use of interaction as a defining quality and characteristic of distance education. This model defines critical interaction in educational contexts as having three essential components: learner–content, learner–instructor, and learner–learner interaction. As an extension of Moore's model, the EQuiv was created with the purpose of providing "a theoretical basis for judging the appropriate amounts of each of the various forms of possible interaction." For a detailed history of interaction theory, please refer to Miyazoe (2012).

The main features of the EQuiv are condensed into two theses:

- Thesis 1. Deep and meaningful formal learning is supported as long as one of the three forms of interaction (student–teacher; student–student; student–content) is at a high level. The other two may be offered at minimal levels, or even eliminated, without degrading the educational experience.
- Thesis 2. High levels of more than one of these three modes will likely provide a more satisfying educational experience, although these experiences may not be as cost- or time-effective as less interactive learning sequences.

In accordance with the EQuiv formulation, Anderson had expanded Moore's interaction model to all possible six components: student–content, student–teacher, student–student interaction, plus teacher–content, teacher–teacher, and content–content interaction (Garrison & Anderson, 2003).

Figure 1 is an attempt to visualize the two EQuiv theses. The figure on the left represents Thesis 1 and its two main points: 1) in its extreme, a high level of one of the interactions (i.e., student–teacher, student–student, and student–content) is able to achieve insightful, meaningful formal learning, and 2) each interaction has the same value (equivalency = equal + value), which is denoted by using the equal sign. Additionally, the coloured shading highlights the difference in the various intensity levels (high, middle, and low) of interactions: a deeper hue signifies a higher level of interaction intensity. The figure on the right represents Thesis 2, which is the following: more than one type of high-level interaction is desirable in order to increase learner satisfaction. The component of cost/time efficiency will be detailed in the next section.

It is important to emphasize that the main point of Thesis 1 is concerned with the effectiveness of learning (that is, the qualitative aspect of the educational interaction). By contrast, Thesis 2 is concerned with learner satisfaction and cost/time efficiency (quantitative). In addition, Terry Anderson originally meant for the cost/time concept to be applicable for both program providers (including institutions and tutors) and learners.

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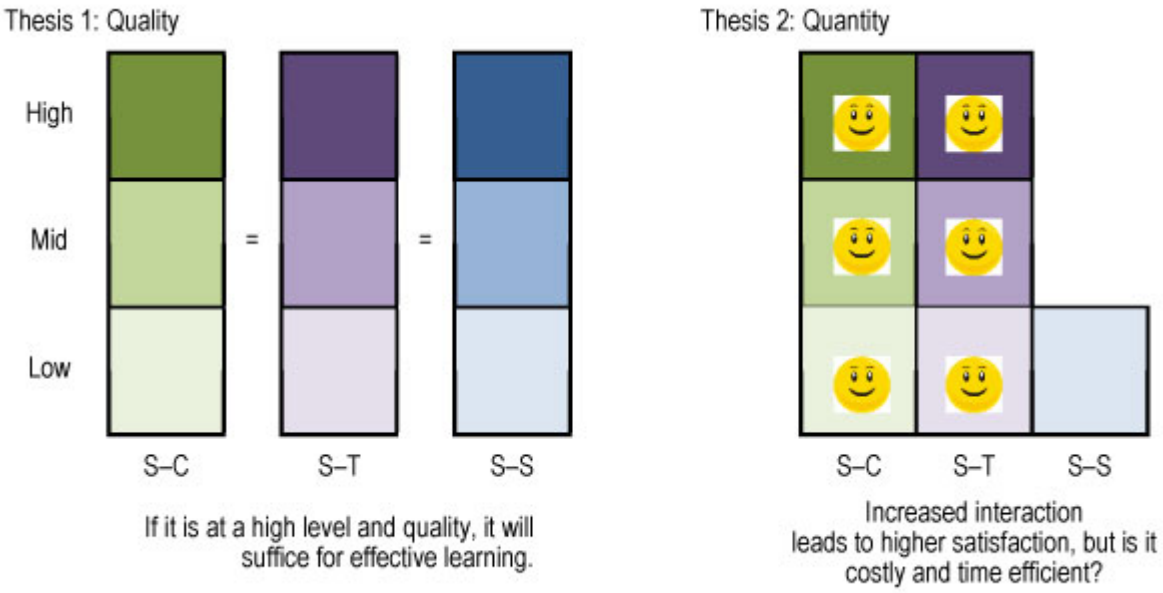

Figure 1. The EQuiv Visualization

EQuiv and Cost/Time Issues

Interaction is expensive in any format and has time, financial and opportunity costs for learners, teachers and institutions. Instructional design refers to the entire process of achieving educational outcomes (Siemens, 2002) and thus includes consideration of interaction costs. By contrast, interaction design (ID) is focused on the specific course/curriculum design for learning. When we plan for an increased amount of interaction in an educational course (for example, a higher frequency of Q&A between teacher and students using an online forum or a higher frequency of socialization among students using SNS space), additional cost/time is required.

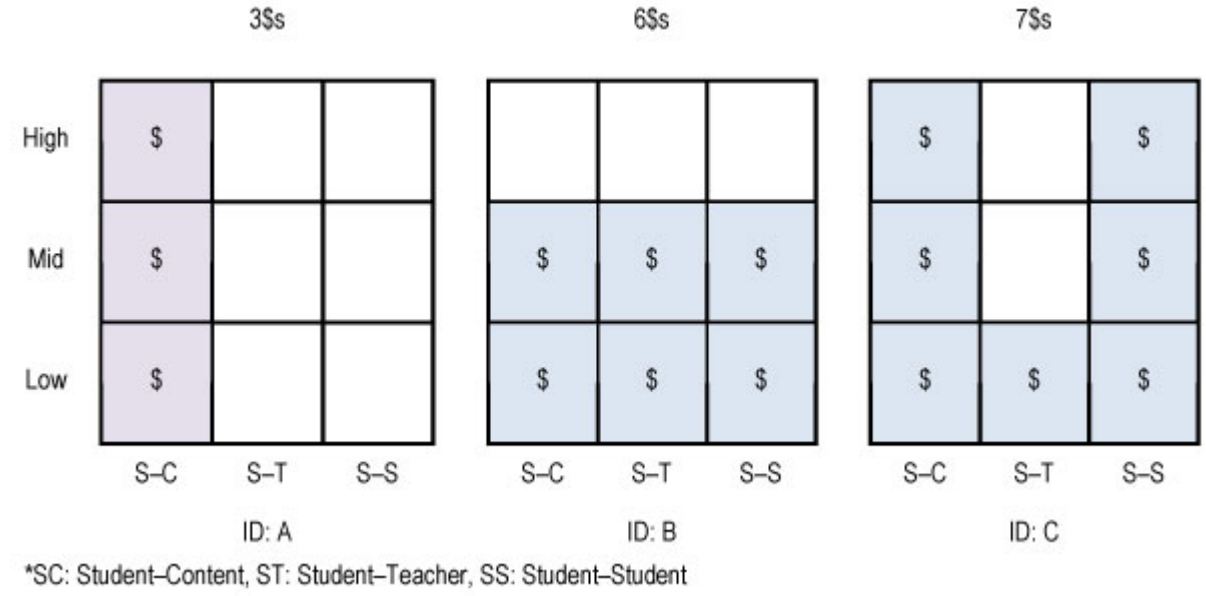

Figure 2. Cost/Time Issues in Interaction Design

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In Figure 2, let us suppose that ID: A is the most efficient design (it has achieved the highest level of learning with the least cost/time), and ID: C is equally effective (it achieves the same high level of learning) and satisfactory (due to the variation of high-level interaction) for a specific purpose in a particular context. In many cases, the ID used could be ID: B, in which a moderate level of all the three interactions is implemented with the hope that the ID will satisfy the needs and expectations of the highest number of stakeholders. It is important that the EQuiv considers that the optimal ID will likely be different, depending on the numerous variables in a specific context (Miyazoe & Anderson, 2010, 2012). However, ID: B and C could be less desirable if both effectiveness and efficiency are demanded.

The EQuiv in the Contexts of OER and Informal Learning

The idea of OER and informal learning potentials in the EQuiv had been noted by the authors (Miyazoe & Anderson, 2011) when they discussed closed versus open systems in educational resource provisions:

The conceptualization of the theorem clarifies further dimensions that need to be considered in the interaction design. One of these dimensions is the diversity of educational delivery contexts (i.e., closed vs. open systems). In a closed system, due to the limitations of cost and other resources, the designer may have to choose which possible interaction is the most important. In an open system, positive and accidental interaction surpluses (e.g., a course teacher voluntarily adding new online resources or inviting a guest lecturer to activate the course) are possible. The cost and time issues are relative to the system chosen as the framework of the course design (p.2).

The availability of the ever-growing OER and informal learning opportunities relate to this "opening" of the traditional education systems, which notes the "accidental interaction surpluses" are increasingly important variables to be taken into the formal educational curricula and systems. The educational institutions are becoming the networks of information and knowledge aggregation where partially open educational systems are digitally connected to each other. The Modes of Interaction model posited by Garrison & Anderson (2003) is useful to analyze the various types of learners with the new OER and informal opportunities alongside formal learning:

- Student–Content: Increasingly, students are being asked and challenged to create content and find and share OERs that can enhance and augment the content supplied by the course creators.
- Student–Teacher: Students gain a teacher-like presence from various sources (recordings of other teachers, MOOCs, etc.) other than the formal teacher even though the issue of responsibility, morality, integrity, accuracy, bias etc. can be confusing to students.
- Student–Student: Numerous online platforms for socialization are available, and students can achieve a high-level of interaction among peers within and those not enrolled in the course in various ways outside the formal curricula.

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- Teacher–Content: Teachers (or course developers) are able to collaboratively create and use content through tools like Wikis and OERs that allow them to both create and use multiple types of content.
- Teacher–Teacher: Numerous online resources and platforms allow teachers to interact and learn within networked communities of practice.
- Content–Content: With digital networks, content is interactive and can be designed to update and augment other content thus growing prolifically beyond the formal/informal distinction.

The current issues and challenges that formal education systems have/will face amid expansion of OER and informal learning will next be examined using the EQuiv framework of learning outcomes (Thesis 1), learner satisfaction and cost/time issues (Thesis 2).

Learning Outcomes

In the formal learning environment, where OER and informal learning opportunities abound, students can rely on a high-level interaction of many kinds from various resources without major limitation. In this context, Thesis 1 remains valid because its primary focus is on quality; the difference in material location (inside/outside of school) and learning mode (formal and informal) are peripheral to the issue. This also signifies that quality learning can occur even if formal education fails to provide the necessary intensity of interaction as the learner knows he/she has opportunity to access external means to supplement to an expected level of interaction. For example, a student in a formal course may access content from iTunes University, a MOOC, Khan Academy or an international network of students studying in the discipline. In this sense, the realization of quality learning has become equally dependent on each learner's ability, which begins with choosing the best formal program that fits his/her needs and extends to creative augmentation of the best available OER and informal learning opportunities.

Learner Satisfaction

As we saw above, Thesis 2 suggests that having more than one kind of high-level interaction is likely to be associated with higher learner satisfaction. With OER and informal learning opportunities, when a program provides only one kind of high-level interaction, students can gain a higher level of satisfaction by using other kinds of high-level interactions from outside sources. Take, for example, the "flipped classroom" in which students acquire knowledge input through searching for content from OER in order to complete tasks or assignments and then use the formal course time for topical discussion. Hypothetically, the student's satisfaction level would be quite high and this was shown in a recent Australian study (Butt, 2012). Therefore, like learning outcomes, if an individual learner gains high satisfaction from any formal or fixed learning design depends upon his/her ability to obtain and effectively utilize an additional "surplus". This could further be facilitated if the provider (course tutor,

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content designer, etc.) provides training in OER selection and a helpful resource bank for consultation and for student augmentation.

Cost/Time Issues

Cost/Time issues warrant an in-depth, complex analysis, particularly when OER and informal variables are involved. The dollar sign symbol represents cost; whereas, the clock symbol represents the time spent during an interaction.

The figures in Figure 3 represent three hypothetical cases of high-level interaction:

- ID: D (the left side) – The formal program provides high-level interaction Student Content (S-C), and high level Student–Student (S-S) is provided in some way (by the program or through learner initiative). This model is practiced in many commercial MOOCs. MOOC financial models are evolving but will likely focus on advertising and sale of auxiliary product.
- ID: E (the middle) – The formal program provides a high-level interaction of one kind, and the learner is committed only to this format. This format is offered for example, by purchase of a training package delivered via video, CAI or text.
- ID: F (the right side) – High-level quasi-cost-free interaction of two kinds are used at the learner's initiative as for example, by engagement in Learn.ist cluster, supplemented by local study group.

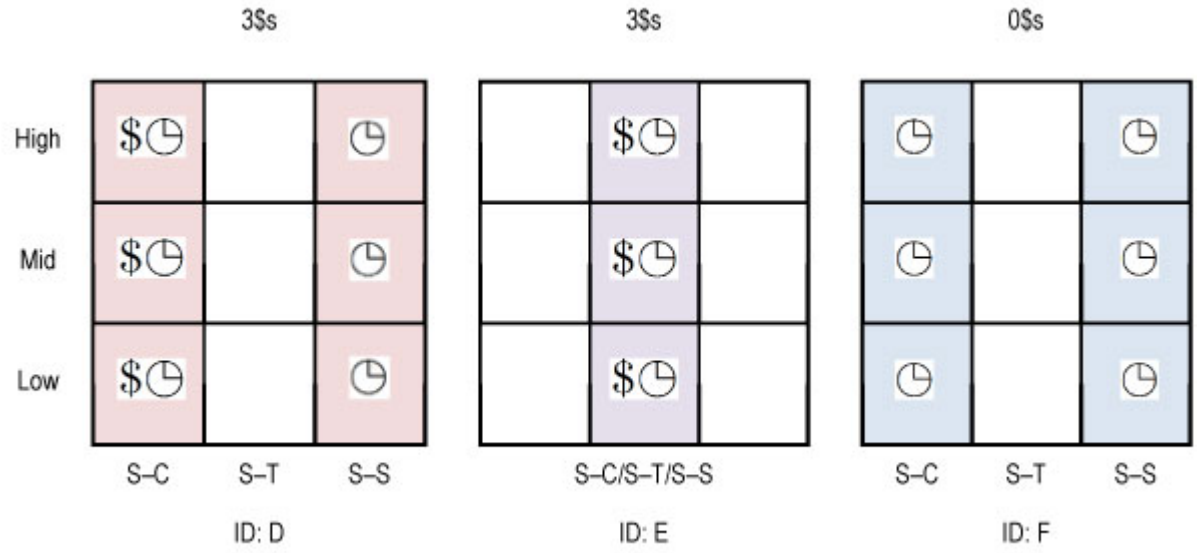

Figure 3. EQuiv in OER and Formal Learning

Following the EQuiv theses, ID: E is the design in which the educational institution is concerned and tasked with creating high quality; whereas, ID: D is the design that is focused on maintaining an equal level of quality learning, but provided by the institution creating high quality content and encouraging the student to find their own S–T and S–S support. However,

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we should note that a higher level of satisfaction is not cost-free: it consumes more time of the learner, which is not free but precious because learners in online and distance education are often employees. Of course, time for full-time workers is expensive, but even more for the underemployed. "Opportunity cost" (Matkin, 1997) applies to everyone – time spent studying precludes engaging in other activities. In other words, in terms of time efficiency, with ID: E, students spend only 3 dollar-time for one kind of high-level interaction to complete the formal requirements; whereas with ID: D, students spend 3 dollar-time for high-level S–C interaction to fulfil the formal course requirements plus 3 dollar-time for high-level S–S interaction outside but paying 3 dollars for the formal part only; with the ID: F design, although it may be inexpensive for the active use of OER and others, the learner may have spent twice as much time, that is, 6 dollar-time, though they may pay quasi-zero dollars in reality, to gain a level of learning similar to ID: E. In sum, there are *visible* and *invisible* costs and the learner could spend more (of either of these scarce resources) to gain the same, or worse, less. These invisible time-cost does exist all the time but the OER and informal learning opportunities make the extent of this invisibility more pervasive.

It is worth noting that the same argument also applies to the teacher experience. With no or low cost for additional interaction for the educational providers, those "surplus" interactions are more likely to be suggested as options rather than requirements. That is, the surpluses may appear to be cost-free, but in actuality, they are volunteer activities that consume the teacher's time.

And when we go back to Thesis 2, more than two kinds of high-level interaction increase the level of satisfaction. On the other hand, the level of satisfaction depends on the time-cost efficiency also, whose satisfaction level differs learner to learner: for those who value time, even if ID: D and ID: E cost the same, ID: E may be more satisfactory. In the same way, those who value time prefer choosing ID: D over ID: F even if he/she has to pay because ID: D saves valuable time. In other words, in the OER and informal era, time-cost efficiency becomes even more critical in choosing the best learning than before. The quality-time-accessibility triangle posited by Daniel (2003), in reference to the external vectors of education and mega-universities, may now be re-phrased as both institutional vectors and the individual learner vectors of *quality-time-cost* especially in the places where the issue of accessibility is more attenuated by the Internet.

Discussion and Further Direction

From the EQuiv perspective, it seems apparent that "formal education" should and indeed must cost less if it hopes to survive in an era when alternative forms of free educational opportunities grow rapidly. However, "time is money" principle suggests that the time needed to achieve quality learning may remain consistent in the new era of learning. Additionally, this paper admits that there needs to be a higher level of a learner's control over his/her learning design by creating necessary *surpluses* as well as *reductions* in order to produce learning at the highest level of effectiveness and efficiency. For this to be achieved, there needs to be a high

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quality of learning resources available and learner must be capable of highly skilled time management. In sum, the ability to *manage the cost and the time for learning* is becoming extremely critical to formal students and lifelong learners in this emergent world of network enhanced learning.

In this context of new learning, how does the formal education claim its raison d'être? The answer implied in this paper is to provide education that creates adaptable models of high-level interaction – but allows the learner to augment or choose adaptations that meet their constraints and time and money resources. In other words, select Thesis 1 and adhere to it. This minimalism seems to be the only way to survive in the ever-tightening world economy. Consequently, for learners who have acquired the skill of managing his/her learning, the formal educational system is losing its traditional status and authority as the only authentic education provider. It is time that we accept this change and recreate our institutions for service in a networked, lifelong learning context.

Resource-Sharing

For now, we have an online course that collects references and resources for the study relevant to the EQuiv (http://equivalencytheorem.info). We welcome people who have a serious interest in the research regarding the EQuiv. We invite you to contact us for further information sharing and collaborative research projects regarding the development of the EQuiv.

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NAVIGATING THE RISK SOCIETY – HOW THE EDUCATIONAL ENTERPRISE GETS STUCK AND WHY IT NEEDS POETRY

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Abstract

The paper addresses the key question posed by the EDEN 2013 Conference: "How can we do our best to make learning a thrilling experience for learners, including providing a sense of joy in the virtual classroom?" It explores the proposition that the dominant organisational culture and modus operendi of the educational enterprise is based on 'stuckness' and resistance to change. This creates barriers to 'thrilling' and 'joyful' learning – even in the face of advances in the adoption of ICTs to support more innovative teaching and learning. The paper reviews the factors that lead to stuckness in the organisational enterprise with reference to 'life politics' theory in sociology and with regard to organisational psychodynamics. It presents an approach to dealing with stuckness, based on an 'alchemic model' of innovation and discusses how this model will be applied in two research projects recently funded under the European Commission's 'Lifelong Learning Programme'.

Background

The old certainties that linked learning to jobs no longer apply. Post-modern theories based on 'life politics' suggest that changes in post-industrial society have eroded the power of the old institutions centred on family and community to support 'resilience' – including developing the social capital that comes from education. Beck's theory of 'reflexive modernisation' is based on the assumption that changes in post-industrial society have led to the emergence of the 'risk' society. As the old institutions of industrial society are undermined by globalization, each individual must learn to navigate society for themselves. The most vulnerable groups in this are the old and the young. Young people have to navigate this 'risk society' while having to manage their own 'ambivalent biographies' with little support from increasingly fragile social structures including their own family, and in nation states that have restricted welfare provision for young people based either on their age or on their lack of employment history. These restrictions have been exacerbated in recent years by the financial crisis and the austerity measures that have been imposed on the economies of many member states.

Giddens argued that risk and uncertainty are the hallmarks of a 'runaway world'. Individuals are forced to interpret diverse, unpredictable experiences in order to establish their own coherent biographies. No longer regulated by external structures and norms, the self has become a fluid and "reflexive biographical project". On the one hand, this allows unprecedented freedom and opportunities. On the other, self and identity become fragile, individualisation becomes a lonely business "full of risks which need to be confronted and fought alone". Young people are now more than ever free to become architects of their own lives – but the culture of individualism, and the pressures it generates in terms of having to achieve, conspire to promote a sense of failure, marginalisation and, for some, mental ill-health (Rutter and Smith, 1995; EGRIS, 2001). Against this background, it seems clear that profound socio-cultural changes associated with the 'Knowledge Society' are promoting equally significant changes in what we learn and how we learn it, and hence in the ways in which learning systems are responding to these changes. If young people are increasingly called on to negotiate the minefields of ambivalent biographies and biographical projects, they need to learn faster and more flexibly; they need to access and evaluate information more efficiently and effectively, and they need to become better at making choices based on the available evidence – not least because of the increasing role played by new technologies in shaping cultural discourses.

Yet there is compelling evidence to suggest that the educational enterprise – at all levels, from kindergarten through school, to university and into the world of adult education – remains stuck in an outmoded cultural and organisational bind that renders it incapable of responding to these profound changes and challenges. As a result, evidence is emerging that young people are increasingly confused about the learning choices they need to make and how these choices will impact on their future life course. One indicator of this is the rate of early school leaving (ESL). In 2003, the EU Education Council set a target to reduce early school leaving to a level of 10 % by 2010. By 2010, the average rate of early school leaving across EU27 states stood at just under 15 %, and the benchmark target of 10 % has now been re-scheduled to be met by 2020, as part of the key targets of EU2020 (Eurostat, 2010). Similarly drop-out rates in higher education have remained consistently high despite recent policy initiatives aimed at making higher education more inclusive[1]. Other signs of an incipient stuckness in the educational enterprise are reflected in high levels of stress and anxiety in the teaching professions; high rates of turnover in schools and other learning enterprises and a failure to modernise organisational structures and processes. A recent report on stress in the classroom, carried out by the BBC in the UK concluded that "About 80 % of teachers complain about stress at work and thousands of teachers leave the profession every year – predominantly due to stress." According to the UK Teacher Support Network, which runs a well-being helpline: 'One in four of those teachers who called between January and March this year (2011) described themselves as suffering from stress – compared to one in five the year before. The helpline has thousands of calls and e-mails every year from teachers struggling to protect their wellbeing at work'. Policy documents and studies show that leadership and governance skills in schools remain poorly-developed (EC 2007 Communication Improving the Quality of Teacher Education) and that progress in developing such skills has been slow and haphazard (EC

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Impact Assessment, 2007). A study of head teachers (Balanskat and Gerhard, 2007) concluded that 'Leadership issues are a major concern in several countries'. A UK OFSTED report in 2001 concluded that school governors are 'amateurs' and that differences in skills, expertise and power between senior professionals and governors are a major obstacle to modernising the school[2].

Stuckness

Watzlawic (1974) defines stuckness as 'a person, a family, or a wider social system enmeshed in a problem in persistent and repetitive ways, despite desire and effort to alter the situation'. People, families, organisations, societies get stuck for a number of reasons and in a number of different ways, and so it is possible to conceptualise 'stuckness' from a number of levels. These range from a psychological level, for instance looking at how individuals find it difficult to change their behaviour because of things like low self-esteem, to the broadest societal level. As an example of the broader level, in a recent lecture to launch the UK Royal Society's 'Changing Minds' programme, the RSA's Chief Executive, Matthew Taylor, suggested that the current crisis of western society reflects a deep cultural inertia, and an inability to move beyond comfortable, and outdated, notions of how humans think and learn[3].

Schools get stuck because of a number of complex factors: the drive towards greater devolution of control and more say for teachers, parents and students in school affairs; the increasing pressure on head teachers, governors and school managers to deliver 'quality', 'choice' and 'value for money'; the demand for new teaching and learning methods, using the potential of new technologies like social networking. In the face of these pressures 'stuckness' in schools can be seen as a vicious circle that starts with the stresses and anxieties that teachers have to deal with in their work practice; leads to pressures for teachers to change the way they teach; then subsequently reflects anxieties created by resisting change and finally includes the stresses and anxieties created by NOT changing in the face of these pressures.

Yet it is clear that 'stuckness' is that it is not simply an 'individual' (teacher) problem. It is an organisational problem. As organisational behaviour theorists have argued for many years, organisations typically act as 'defences against anxiety'. Although schools, like most organisations, appear to function logically and rationally, developing and applying explicit tasks; systems of organisation; rules and mechanisms to resolve conflict, there is plenty of evidence that, under the surface, schools, like most organisations, also operate in irrational ways. This 'underground' behaviour is often driven by 'unconscious' processes and typically surfaces as dysfunctionality and resistance to change. Post-secondary education shows similar patterns. As noted above, the evidence of increasing student drop-out rates can be set against a corresponding failure by HEI's to provide relevant and effective guidance and counselling services. Moreover, this is taking place against a bigger backdrop of a higher education culture and organisational structure that is failing to recognise, let alone keep pace, with 'risk society' and the changed perceptions, aspirations and needs of students. Although the shift from an industrial to a knowledge society has been clearly recognised in policy circles, 'new' lifelong

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learning and e-learning models are primarily updated versions of the old 'human capital' paradigm (Becker, 1975). In higher education, research points to the emergence of a 'new pedagogy' based on ideas of 'performativity' and 'customer-orientation' (Usher, 2001). Essentially, the influence of the human capital model in shaping learning agendas, systems and services has led to the domination of a highly individuated vision of learning, focused firmly on employability and 'reproduction' rather than on 'transformative learning', and based on a singularly 'linear' notion of learning as seamless transition pathways from school to higher education to work to professional development. As a result, universities find themselves in a similar pattern of stuckness as schools.

Dealing with stuckness: the IGUANA and STAY IN projects

Against this background, this paper presents an experimental approach to dealing with stuckness in the educational enterprise with reference to two projects recently funded under the European Commission's 'Lifelong Learning Programme'. The first project – IGUANA - aims to enhance understandings of the 'risk society' and 'organisational stuckness' in the context of education and training and to apply these understandings to work with schools in identifying and overcoming the factors that inhibit schools from becoming more effective and efficient institutions capable of operating in the modern education system and in the broader social and economic environment outside. This means creating the conditions in schools that can nurture effective leadership but leadership that involves collaborative working between the different stakeholders. IGUANA therefore supports 'training for good governance' in schools by developing a 'learning community'. This will integrate and build on techniques and tools developed by the eight partners from six different EU countries working in the project, including programmes currently being provided in UK schools based on developing 'emotional intelligence' for staff and students. The IGUANA programme will be supported by 'Web 2.0' tools, such as social media, to promote co-working and sense-making. It will also develop and test 'blended learning' approaches combining ICTs with mixed media methods, including poetry and drama. The second project – STAY IN – focuses on reducing student drop out in higher education institutions by exploring ways of developing innovative guidance and counselling services including 'e-counselling'. STAY-IN moves beyond the narrow 'reactive' paradigm that characterises current student guidance and counselling services to explore ways of delivering guidance as a holistic and on-going process. Like IGUANA, it references the wider 'risk issues' that are contributing to anxiety and uncertainty for young people and which are not currently addressed in HEI guidance services.

The approach developed in IGUANA and STAY IN to work with 'stuckness' in the educational enterprise draws on the 'systems psychodynamic' approach to understanding organisations. This has long argued that organisations typically act as 'defences against anxiety' by operating in 'groupish' mode (Bion, 1961; Miller,1996). On the one hand, the 'conscious' organisational mode involves the work group and its leadership in defining explicit tasks; systems of organisation; rational rules; conflict mechanisms; management of change. However, people also bring into the work group unconscious dynamics that are

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rooted in their childhood experience – particularly the loss of boundaries children experience in the transition from childhood to adulthood. In this 'unconscious mode', people and their organisations will create and apply strategies to reduce anxieties and to resist change. This is because the organisation, and the work group, replaces the boundaries lost in childhood. It provides an environment that protects them from anxieties and provides a definition of status – the location of the 'me' in relation to the 'not me'. Bion suggested that the work group operates in unconscious mode in three main ways to develop and implement strategies to deal with issues around leadership and authority. When faced with a change in organisational status – and therefore faced with a threat to the organisation's capacity to defend its members against anxiety – the work group will adopt either a 'fight/flight' strategy (resisting or retreating from change, for example by searching for a scapegoat to blame); a dependency strategy (for example searching for an 'omnipotent leader) or a 'splitting and pairing' strategy (for example fragmenting into sub-groups in the hope that new alliances will produce a new leader).

A powerful defensive strategy to deal with anxiety is 'mirroring' behaviour – resisting change by adopting the dysfunctional behaviours of clients. Cardona (1999) describes how teams 'work as a sponge' absorbing and soaking up the central dynamics which operate within their client group, often without realising that this is happening. In one of Cardona's case studies – Cherry House – front line staff working in a hostel for chronically mentally ill people coming in off the street were observed to only come alive when they were faced with a crisis precipitated by the needs of clients. In intervening periods, they tended to sit passively, waiting for the next crisis to happen, unable to reflect on why they were doing their work; what effect their work was having in supporting lifestyle change for clients, and how they could do it better. This behaviour mirrored the behaviour of their clients. When an organisational innovation was introduced into the workplace – in this case a shift from 'reactive' to 'rehabilitative' care – the staff unconsciously sabotaged the intended change. The new approach in this case focused on implementing a strategy to get clients to take more control over their lives by organising their meals and doing the cooking. In reality, the staff themselves did all the work, ensuring that the old staff-client relationship, one based on dependency, was preserved.

It is possible to identify within the educational enterprise similar types of organisational defensive strategies. One example is the use of ICTs for teaching and learning. A recent 'Futurelab' report highlights a 'digital divide' between teachers and student skill levels which may affect how students are able to access ICT in lessons. Many teachers want to maintain control over the curriculum and what students are learning and the teachers' perspective on what and how to learn often clashes with those of their students. As a result, mobile devices and social media applications are banned in many schools across many EU states[4]. A recent survey in the US involving 300,000 students, 43,000 parents, 35,000 teachers, 2000 librarians and 3500 administrators from over 6500 private and public schools showed that whilst 70 % of parents are likely to buy a mobile device for their child to use at school, 65 % of school administrators said they would not accept the use of mobile devices by students in their

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schools[5]. This research suggests a similar pattern of 'unconscious sabotage' of change to that illustrated in the Cherry house example cited above. In a more extreme example, Devine-Eller (2004) observes that 'some schools, like some prisons, have begun using radio frequency identification (RFID) chips to track students' movements. The chips are currently contained in plastic ID cards students wear around their necks'. Devine-Eller also illustrates some of the ways in which new technologies in the school are now being used to reinforce the devices schools have to exert control over students. These vary from overt measures of bio-control, such as the increasing use of Ritalin ostensibly to help students with ADD/ADHD, to more covert measures such as the use of timetabling for student surveillance and the regulation of student behaviour. This trend, like the example of Cherry House, could be interpreted as another strategy aimed at maintaining the dependency culture schools have long imposed on their students.

In this context, a key conceptual component deployed in the IGUANA and STAY IN approach is the 'holding environment' (Winnicott, 1965). Winnicott argued that a child's journey to self-awareness – the transition between the child being entirely dependent on its parents to becoming an autonomous self – is shaped by the space in which the child makes the separation between dependency and autonomy. In this space, the child makes use of 'transitional objects' – things that are 'not-me and yet not not-me either' – for example a favourite teddy bear or doll – which the child uses in times of stress to make this separation less traumatic. In organisational theory, the holding environment is migrated to the group context, becoming a space that is receptive to the birth of new ideas and changes that will eventually stimulate growth (Kaplan, 1978). However, in most organisations, the holding environment is deployed not as a space for the cultivation of self-awareness but as a device for the containment of anxiety and for the repression of change. Organisational theory has drawn on the work of Melanie Klein (1959) in this regard, arguing that organisations deploy two defensive positions or stances which people use that interfere with the expression of their inner experience. The first one – the defensive position – is driven by fear of total indifference. Members of the work group are afraid of opening up their inner experience to support change for fear that no-one in the organization will respond. The second one – the paranoid position – is driven by fear of retaliation. It is difficult to risk expressing vulnerable inner experiences (i.e., to tell the truth in a controversial situation) when faced with the possibility of being attacked or punished. Within the educational world this 'defensive holding environment' is illustrated in Figure 1.

As Figure 1 shows, the educational enterprise can be seen as a system which, on the one hand, has to respond to and manage dynamics emanating from the 'turbulent external environment' (Miller, op. cit.) outside. These dynamics include changes in socio-cultural structures and relations associated with the emergence of the 'risk society'; policy changes (like the targets on early school leaving set by EU2020) and economic pressures (for example cuts on educational and welfare resources associated with austerity measures imposed by central government). These create organisational anxieties that become internalised within the organisational life of the enterprise. At the same time psychodynamic processes played out within work groups

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operating within the enterprise create an additional burden of anxiety and tension that is in turn internalised. This combination of external-internal anxiety surfaces, as noted above in defensive strategies like mirroring behaviour and contributes to a self-perpetuating cycle of stuckness within the organisation.

Figure 1. The Defensive Holding Environment in the educational enterprise

Coming Unstuck: the 'alchemic' model

Based on this analysis of stuckness, the main objective of the IGUANA and STAY IN projects is to turn this 'defensive holding environment' from an apparatus that constrains change into one that actively supports change. In IGUANA, the strategy is to develop a pedagogic approach based on an 'alchemic model' of collaborative learning. This alchemic method aims to create an environment in which the hidden, latent and illegitimate talents, creativity and entrepreneurial potential of members of an organisation can be surfaced, nurtured, validated and productively applied. The model and approach draws on a range of theory and practice. It combines two particular pedagogic methodologies: the 'zone of proximal development' (Vygotsky, 1978) and 'cognitive social learning' (Bandura, 1977). The collaborative dimension of the approach also draws on techniques and practices developed by Paulo Freire (1972) who emphasised the importance of critical reflection and collaborative dialogue in supporting learning and behaviour change, and the use of 'action learning' to enable people to 'step into each other's shoes' so that together they can work to produce 'sensemaking'.

The alchemic learning space aims to develop a holding environment within the school that reflects Kaplan's (1978) definition of the positive organisational holding environment – a safe and nurturing space to enable repressed and restricted emotional and creative faculties to grow. Kaplan argued that the group or system attempting to provide a 'holding environment' is symbolically faced with the same dilemma as that of a new mother. The group, or system, in order to be receptive to the birth of new ideas and changes that will eventually stimulate growth, has to address the problem that individuals in groups and systems will not reveal their inner experiences and covert agendas unless the environment feels like a place safe enough to risk new behaviour. To create a holding environment in the work place, group and organizational life must meet the conditions of *safety* and *security*.

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In schools, safety and security appears highly prioritised in terms of organisational protocols like health and safety measures; child protection procedures and the physical arrangement of spaces. However, beneath the surface, unconscious processes conspire to create a climate of repression and resistance to opening up. At the individual level, students are pressurised to perform to academic benchmarks that, for many of them are unattainable. These are compounded by the emotional load students have to bear through things like conformance to peer pressure, coping with bullying, being and staying popular and navigating their way through the minefields of the 'risk society'. In turn, teachers have to cope with similar pressures of meeting targets imposed by government standards bodies; adjusting their professional practice to meet changes in the curriculum; walking the tightrope of work-life balance and meeting the duty of care they have to students whilst at the same time having to deal with the sometimes challenging behaviour of those in their charge. In schools, the fetishisation of performance and the pressure to achieve impossible perfectibility typically imposes a recurrent vicious circle of negative reinforcement, depicted schematically in Figure 2.

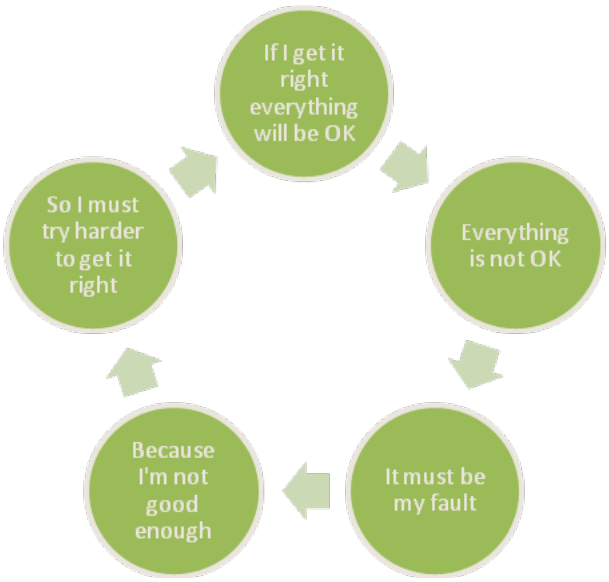

Figure 2. The cycle of negative reinforcement

As Figure 2 suggests, members of the educational enterprise – students, teachers, managers, school governors – are set both conscious and unconscious goals that focus on getting it right. If they get it right, everything will be OK. Yet most schools do not run like clockwork, and the typical mode of engagement in the typical school is one of crisis management. Since it is evident on a daily basis that everything is not OK, the members of the educational enterprise internalise failure as guilt and anxiety – everything is not OK, so it must be my fault – and then attribute failure to meet impossible goals as evidence that they are 'not good enough'. The solution to not being good enough is to try harder to get it right, because getting it right means that everything will be OK, and so it goes on through the cycle of stuckness.

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At the organisational level, negative reinforcement becomes embedded through unconscious psychodynamics that operate below the surface of the formal structures and procedures the educational enterprise deploys to define its explicit tasks; systems of organisation; rational rules; conflict mechanisms and management of change. As noted above, the members of the educational enterprise will often deploy defensive strategies against anxiety, with members adopting a dependency position by putting their faith in an omnipotent leader (the 'super-head-teacher') to solve their not-good-enoughness; a 'fight-flight' position by demonstrating aggression or withdrawal, or a 'splitting' position, pairing off into splinter groups, based on divisions like departmental allegiance, in the hope of producing an alternative leader who can rectify their not-good-enoughness (Bion, 1961). They may adopt a 'mirroring' position that replicates the perceived obstructive behaviours of their students (Cardona, 1999), a 'one-ness' position, in which group members come together as one, for the purpose of joining in a powerful union with an omnipotent force (Turquet, 1974), or a 'me-ness' position, in which the group behaves as if it is there to be saved from its irrational feelings by being a non-group (Lawrence, Bain, Gould, 1996). At the same time, the formal structures and processes set up to implement the organisation's explicit tasks; systems; rational rules; conflict mechanisms and management of change themselves act as powerful mechanisms for negative reinforcement, and as theatres in which to play out the psycho-dramas of dependency, fight-flight and splitting. As noted above, studies suggest that the governance structures in schools are characterised by dysfunctional power relations; poorly-developed leadership and governance skills and innovation atrophy (European Commission, 2007; Balanskat and Gerhard, 2007; OFSTED, 2000).

In order to address these issues, the alchemic model being developed in IGUANA aims at creating a positive holding environment in which these anxieties, defensive positions and cycles of negative reinforcement can be surfaced, explored and worked with. IGUANA explicitly targets the school governance body as the apparatus within which the positive holding environment can be developed because this institution is the key formal change mechanism within the school, and it is also the space in which all stakeholders in the educational enterprise are represented. By working with this core body, and its members, the intention is to strengthen the innovation capacity of the school, through a blended learning programme combining three components: emotional intelligence building; leadership competences and evaluation competences. In essence, the objective is to turn the dysfunctionality of the educational enterprise on its head by tapping the energy that organisations and their members put into resisting change, and then re-applying that energy to support innovation. This is what is meant by an 'alchemic model'. The alchemic approach also aims to support knowledge and competency transfer from the governance body through to the wider community of the school through 'percolation' of the learning gained in the holding environment by 'championing', mentoring and peer-interaction. The model will be developed and validated in five participating IGUANA schools in five EU states and in addition through the European School Heads Association. The 'champions' consist of a small group of staff in each participating school. Their task, supported by members of the participating governor representatives, is to develop a 'community of practice' in each school

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and, through championing the programme, and mentoring their colleagues, engage their fellow-teachers in exploring the use of 'emotional well-being' module of the programme to support their professional development and improve their teaching practice. The idea is thus to 'snowball' the emotional well-being component to enlarge the community of practice in each school. The 'indirect' target group are students in the pilot schools. We anticipate allocating timetable space for teacher 'champions' in each school to run exploratory workshops using an adapted version of the emotional well-being module with small classes of pupils.

The emotional intelligence component of the learning programme aims to support participating members in exploring the dynamics that create anxieties and defensive positions. It focuses in particular in getting participants to identify key behavioural and socio-cultural drivers that govern how their self-image and self-esteem is shaped, how they are linked to performance anxieties and feelings of not being good enough, and how, in turn, they reinforce cycles of guilt, helplessness and stuckness. The pedagogic approach used in developing and implementing this component combines two methodologies: the 'zone of proximal development' (Vygotsky, 1978) which provides for 'scaffolding' of the learning experience, allowing the target groups to learn within their respective personal capacities and resources, and in collaboration with mentors, and 'cognitive social learning' (Bandura, 1977), which emphasises peer interaction and the importance of people learning from one another, via observation, imitation, and modelling. These two methods are aimed at addressing the cycle of negative reinforcement depicted above in Figure 2 by replacing unattainable learning goals with realistic goals that evolve as the emotional intelligence capacity of the group evolves.

The leadership component of the learning programme is based on the 'group relations' approach developed by the Tavistock Institute (Bion, 1961; Miller, 1993). It focuses on surfacing and working with the unconscious dynamics that shape how work groups operate within the educational enterprise, using action learning sets (Pedler, 1997). Action Learning is an approach to the development of people which takes the task as the vehicle for learning. It is based on the premise that there is no learning without action and no sober and deliberate action without learning. In the Action Learning Sets, members of the educational enterprise reflect on assumptions and beliefs that shape practice. Critical reflection can be powerful because attention is directed to the root of the problem and transforms perspectives. People recognise that their perceptions may be flawed because they are filtered through views, beliefs, attitudes and feelings inherited from one's family, school, professional training and society. Critical thinking brings real issues to the fore and subjects them to scrutiny – allowing participants to call into question the rationale underlying their actions and to examine problems from multiple perspectives. Re-formulation of the presenting problem will occur when people uncover misperceptions, norms and expectations that are often hidden. The aims of these action learning sets are to study the ways in which authority is vested in leaders by others, to study the factors involved as they happen, to study the covert processes that operate in and among groups, and to study the problems encountered in the exercise of authority.

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There is no attempt to prescribe specifically what anyone shall learn. Participants are provided with experience-based group opportunities to study their own behaviour as it happens.

The evaluation component of the learning programme is seen as critical to positive learning reinforcement. The overall aim of embedding an evaluation dimension into the design of the learning programme is to generate iterative feedback loops to support 'double loop learning' within the intervention and within the school enterprise as a whole (Argyris & Schön, 1996). Individual and group self-evaluation enables members of the learning group to assess their progress in relation to the new goals set by the programme. The evaluation methodology is thus based on a 'theory of change' approach (Pawson & Tilley, 1997; Weiss, 1995; Sullivan & Stewart, 2006). Theory of change seeks to identify both the explicit and implicit paradigms of change that underlie interventions. It can be defined as a systematic and cumulative study of the links between the activities, outcomes and context of an intervention. It involves the specification of an explicit theory of how and why an intervention might cause or have caused an effect. An initial task for the members of the learning group will therefore be to identify and map the presenting problem (stuckness) and the theory of action that they think will support them in coming unstuck. In turn, specifying the theory of change enables the subsequent development of a logical framework for the learning programme that will specify; the actions required to operationalize this theory (inputs); the expected outputs of the actions; the expected outcomes associated with the use of these outputs; the longer term impacts; how the outcomes and impacts will be measured (Figure 3)

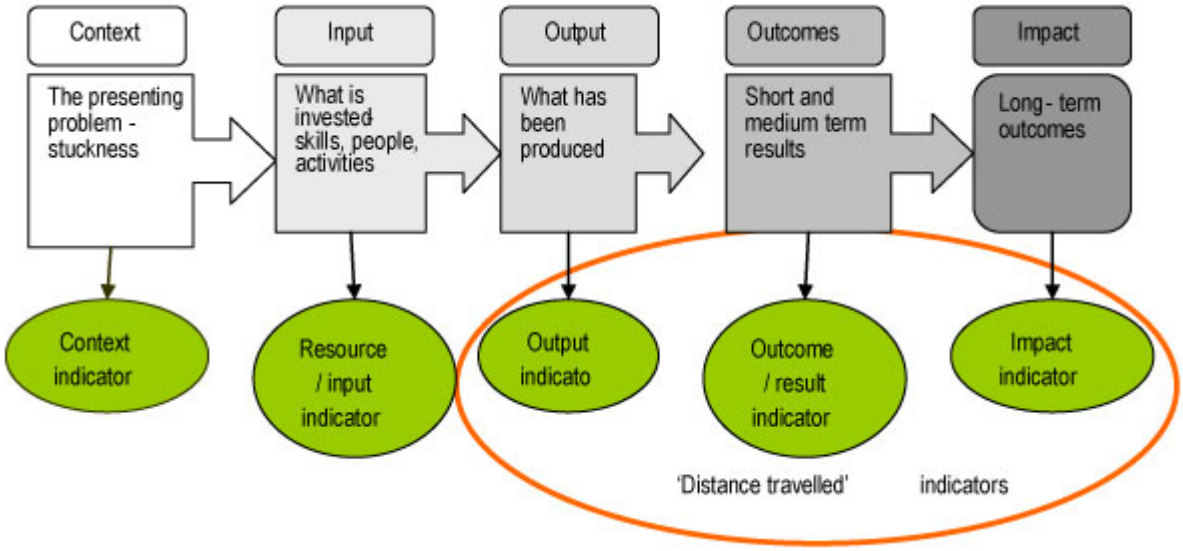

Figure 3. The theory of change

The theory of change 'journey' can be demarcated at a range of points along its trajectory – from 'context', through 'inputs' through to 'outputs', then 'outcomes' and finally 'impacts'. Theory of change can be used as a device to assess how far the educational enterprise has progressed in relation to its ultimate goal of 'coming unstuck', i.e. the 'distance travelled'. It can also be used at the individual level to enable a member of the participating learning group to assess their progress in relation to their individual goals, set against their personal 'zone of

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proximal development'. In this context, distance travelled can be linked to the measurement of 'soft outcomes' that are integral to the emotional intelligence component of the learning programme, for example the measurement of sense of well-being and of self-esteem.

ICTS and Poetry

A feature of the IGANA approach is its use of multimedia as devices for modelling, role playing and learning. One of these devices involves using poetry to create a 'Socratic Dialogue' between participants involved in the learning process. Poetry has a number of inherent advantages in working with stuckness. It is a highly 'narrative' medium, providing a vehicle to tell stories that people can identify with. At the same time, poetry enables the communication of complex conceptual and philosophical ideas and structures within these narratives, through the use of devices such as metaphor and analogy. In addition, despite appearances to the contrary, poetry can be engaging and collaborative. Many studies show that poetry is a powerful vehicle for the retention and transmission of myth and identity. People from all walks of life and across all age boundaries engage in it, although people's engagement with poetry tends to decline as they get older. In this context, the embedding of poetry within a Socratic Dialogue is unusual. Although it has been recognised for some time that the Socratic method, with its repetitive use of 'questioning' as a way of supporting critical thinking, is a very effective tool for teaching[6] there are few examples of the use of the poetic form in the context of developing organisational learning.

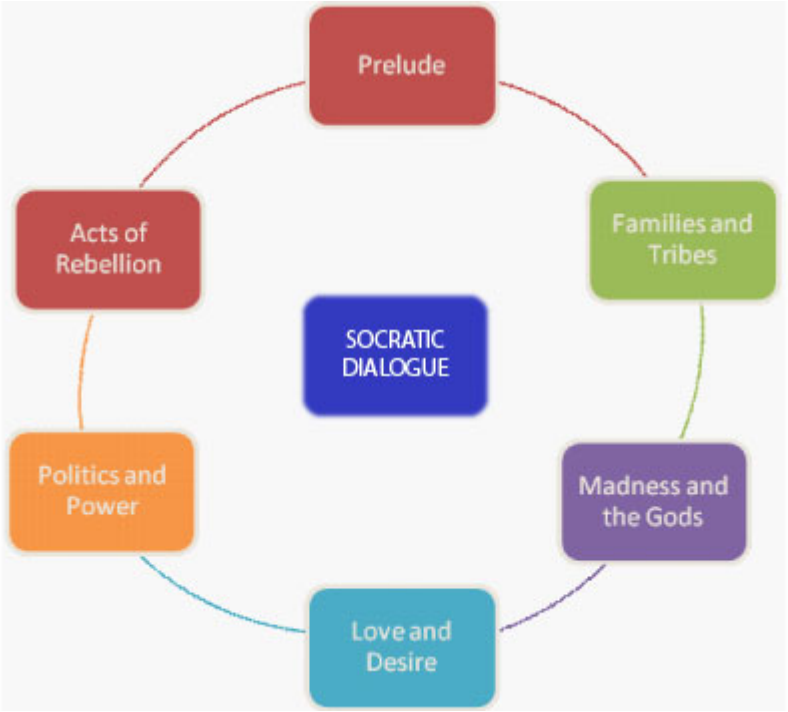

Figure 4. Coming Unstuck – the Socratic dialogue

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As Figure 4 shows, the Socratic Dialogue is built around five broad themes (and sets of questions) that have been selected as key dynamics in the processes that lead to stuckness:

- Families and Tribes – the role of factors like class and community
- Madness and the Gods – the role of factors like psyche and religion
- Love and Desire – the role of things like relationships
- Politics and Power – how societal and political factors contribute to stuckness
- Acts of Rebellion and Reconciliation – the final theme works with strategies people can use to get themselves out of a pattern of stuckness. This theme corresponds to the 'closure' phase in classical Socratic dialogues.

The dialogue is preceded by a 'Prelude' which is a 'scene-setting' device to explain how the process operates and to get participants involved to familiarize themselves with the learning space. Each element of the dialogue is implemented through the following dialogue modes: Questions – the key questions that will be explored through the dialogue; Poetry – illustration of each of the themes and questions by relevant poems; Audio – relevant quotations to illustrate the themes and questions; sound installations; Visuals – an iconic visual image (e.g. a painting) to illustrate the themes and questions.

Complementing the use of this poetic Socratic Dialogue is the use of information and communication technologies (ICTs). The approach uses multimedia (sound and video technologies; collaborative learning technologies and social networking tools) to enable participants involved in the learning process to further explore the ideas that have surfaced in their face to face and group work, to critically reflect on these ideas and to work together within an on-line environment to improve their working environment and their work-life balance. The ICT angle reflects an additional dimension of the approach, one that goes beyond the practical use of new technologies as complementary tools to support learning. The ICT dimension is intended to address the challenges for learning posed by the 'risk society' perspective, outlined above in this paper.

The use of multimedia and poetry in a blended learning environment aims to maximize the collaborative learning dimension of the alchemic approach by providing an additional space to support the operation of the action learning sets in the programme and, more broadly, by applying social media tools, including an on-line forum, to support the positive holding environment being developed in the participating schools.

In the case of the STAY IN project, the aim is to support knowledge transfer from the testing of the alchemic model in IGUANA to explore ways of improving the guidance and counselling services that are currently available for students who experience problems that may lead to their dropping out of study. As noted above, the higher education sector displays many of the organisational dysfunctionalities that can be observed in the school. The increasing emphasis on 'performativity' in goal-setting; the fragmentation of work groups into discipline-based silos; the labelling of mental health issues as signs of failure – are all examples of the kinds of negative reinforcement that underpins organisational stuckness and resistance

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to change. One of the challenges for IGUANA is to explore the extent to which the alchemic approach can be transferred into other educational sectors, and in particular to higher education.

Conclusions

The paper has argued that innovation in the educational enterprise is constrained by an incipient stuckness that makes the enterprise resistant to change. Such resistance reflects deep-rooted organisational features through which the enterprise and its members adopt defences against anxieties that are driven both by internal psychodynamic tensions and by external pressures from outside. A key external pressure has been the effects of profound changes in social structures and relations, associated with the emergence of a 'risk society'. The educational enterprise has struggled to provide its clients with the new competences they need to navigate this new environment. In order to address stuckness, the paper has presented a new learning approach – the 'alchemic model' – that aims to strengthen the capacity of the educational enterprise to surface the hidden dynamics that constrain its openness to new thinking and new ways of working, and to explore ways in which it can convert resistance into creativity and innovation. The model entails developing a 'positive holding environment' within the educational enterprise, through implementing a learning programme, aimed primarily at members of the governance institutions of the enterprise, which combines three elements: an emotional intelligence component; a leadership component and an evaluation component. The approach will be developed and tested in a recently launched project – IGUANA – funded under the European Commission 'Lifelong Learning Programme' and focusing on stuckness in schools, and the results will be transferred to a second project – STAY IN – funded under the same programme and focusing on supporting students at risk of dropping out from higher education institutions. The results of these two research projects will be publicised in future reports.

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[6] see Paul, R, D Martin and K Adamson (1989) Critical Thinking Handbook: High School, A Guide for Redesigning Instruction, Foundation for Critical Thinking

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The Joy of Learning
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JOY AND CREATIVITY IN THREE DIMENSIONAL VIRTUAL LEARNING ENVIRONMENTS (THE CASE OF SECOND LIFE)

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Introduction

In recent years the researchers investigate the opportunities offered by the new online environments for the educational processes. The main parameters of the new educational environments take advantage not only of their potential for remote communication and collaboration, but also of their ability to create new conditions for learning, which are difficult to be established in a face to face environment. As virtual worlds offer a new base for communication, enriched with simulated environments, teachers try to enrich their teaching practices using them. Several studies have shown that the three-dimensional virtual environments are received as pleasant by their users, while they can improve learning. The new environments may have an emotional impact on the user/student, which is very critical for his/her behaviour in the virtual environment, affecting creativity. Muirhead found in his research, that "creativity is positively associated with joy and love and negatively with anger, fear, and anxiety" (Muirhead, 2004, p.71). So it is interesting to investigate the relation of joy (as a reason) and creativity (as a result) during the use of these environments.

Joy of learning

Emotion is a mental activity which produces feelings. Feelings are the representation of the physiological changes that characterize emotions. Unlike emotions, which are scientifically public, feelings are indeed private. Lehtonen, Hyvönen and Ruokamo (2005) showed that emotions are linked to learning in online teaching and learning. The authors suggested that studying needs to take into account student context, i.e., their life situation, as the user of a learning environment develops an attitude towards this environment. This attitude is based on whether the environment meets his/her personal needs and expectations. As reasons for a positive attitude towards the learning environment, Hew and Cheung (2010) mentioned the freedom of movement in a 3-D space, the possibility of meeting other people, the virtual trips and the simulated experiences. On the other hand, they reported that a key reason for dissatisfaction is the technical problems with hardware or software, or the non-physical forms of communication, such as text chat or discussion forum.

The learning environment, through the way of navigation it offers, affects the user's sense of freedom. The mode of content provision may vary from one environment to another. In a regular webpage the content is organized in pages, like a book, while in a 3D environment it is organized in one huge area, like in the real world.

The object referring to the presence inside the virtual environment is the avatar. Other users perceive one's presence by his/hers avatar. Therefore, very often the user develops a close relationship with his/her avatar, taking care of it, as he/she would do with his/her personal items that could disclose his/her identity.

The three-dimensional environment of Second Life (SL) is often perceived by users as game like (Tapsis, 2012). This may be due to the Virtual Reality (VR) data it contains, i.e. an imaginary element that is characteristic of the tale or the game. This has a psychological effect on the user, such as discharging from the stress of the educational process. Practically it is a kind of theatrical stage, where the actors-avatars move according to the wishes of their owner.

Sherman and Craig (2003) noted that there is a difference between traditional educational methods and methods using VR. In VR environments students learn from active experiences in a creative space as opposed to traditional lectures. The chance to experience diverse VR environments may enhance the participants' abilities such as problem solving and creativity (Osberg, 1993).

The important point in VR is that the user comes into a new situation with new conditions. If the new environment is well designed and organized, it can be useful for the learner from educational point of view. Research by Yee (2006) showed that these environments can make users feel a kind of escapism. To the extent that the escape is controlled, may deliver the user / student from the stress of the educational process.

One great advantage of the collaborative virtual environments is the potential for communication. They can develop students' experiences and understanding of context with joy (Holland & Flagg, 2004). The abilities of an environment on simulation of a classroom (virtual classroom) and oral communication, facilitates the development of a virtual community, who supports cognitively and emotionally its members.

The environment of an online team provides unique challenges in meeting the socio-emotional needs of team members (Chidambaram, 1996; Lurey & Raisinhgani, 2001). In a purposeful educational environment, students' needs appear to shift from emotive communication to that of group cohesion, which encourages collaboration in an online environment (Vaughan, 2004).

Emotions may be seen as mental stages of readiness for action, setting priorities and prompting plans (Lehtonen, Hyvönen & Ruokamo, 2005). A collaborative environment improves social presence and interaction, improving the sense of proximity, connectedness, sense of community and the development of personal relations. At the research of Tapsis (2012) students reported that fast communication gave them the impression of stronger

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interaction. So it seems that the dynamics of the virtual environment facilitate socialization of students due to the rich information that can be exchanged among the users, with immediate results on interaction.

Creativity

Defining the meaning of creativity

The concept of creativity is often described as "creative thinking", "problem solving", "innovation" or "production of original ideas" and is opposed to the concept of uniformity and conformism. Many definitions introduce the concept of new or prototype. According to Sternberg (1999), creativity is the ability to produce work that is new, original, unexpected, that should have value and be "appropriate and helpful". The combination of new, appropriate and useful is met with wide acceptance, while the concept of authenticity is a necessary but not sufficient condition for creativity (El-Murad & West, 2004).

Warr & O'Neill (2005), distinguish three axes that definitions are developed: creative process, creative personality and creative product. Studying the definitions we propose a unified definition, according to which creativity is a combination of unusual or new ideas, which are suitable for the solution of the problem defined in the creative process, favoured by the socio-cultural diversity and developed in a specific time and place.

For Florida (2002) the concept of creativity is a highly estimated resource of the economy and does not apply only to artists and inventors. It is a multidimensional concept that relates to the economy, technology and the institutional and organizational framework of a city (or a country). It is a competitive advantage, emphasizing the development of a strong technology sector, providing a variety of stimuli, incentives and opportunities and accepts the diversity of the new. Regardless of the existing definitions, creativity is a complex concept referring to flexibility, diversity and in the way of thinking, as to produce an innovative result.

Factors affecting creativity

There are numerous scientific reports about creative thinking, idea generation and problem solving processes. Creative individuals, making associations, abstractions, simplifications, combinations and variations, apply certain principles in an unpredictable manner, to generate ideas. It seems that there is an agreement among researchers that creativity is the product of many interrelated variables, it is not an internal process, nor a property gifted to a few people. It is possible for different people to show creative behaviour in different ways. So it can be taught and nurtured by all people.

According to Sternberg (2000) and unlike some other researchers, people are creative not because of any virtue, internal factors or innate ability, but because of a skill in decision making and choice, that can be grown. Therefore, creativity can be the result of attitudes and behaviours that each person takes in life and work.

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While creativity cannot be imposed, it has been reported by participants in cooperative activities that they were "forced" to be creative. Processes and interaction that take place within cooperating groups may be an important source of creativity and innovation. Paulus (2000) presents the social factors that hinder the creativity of teams and those who stimulate, in the following figure.

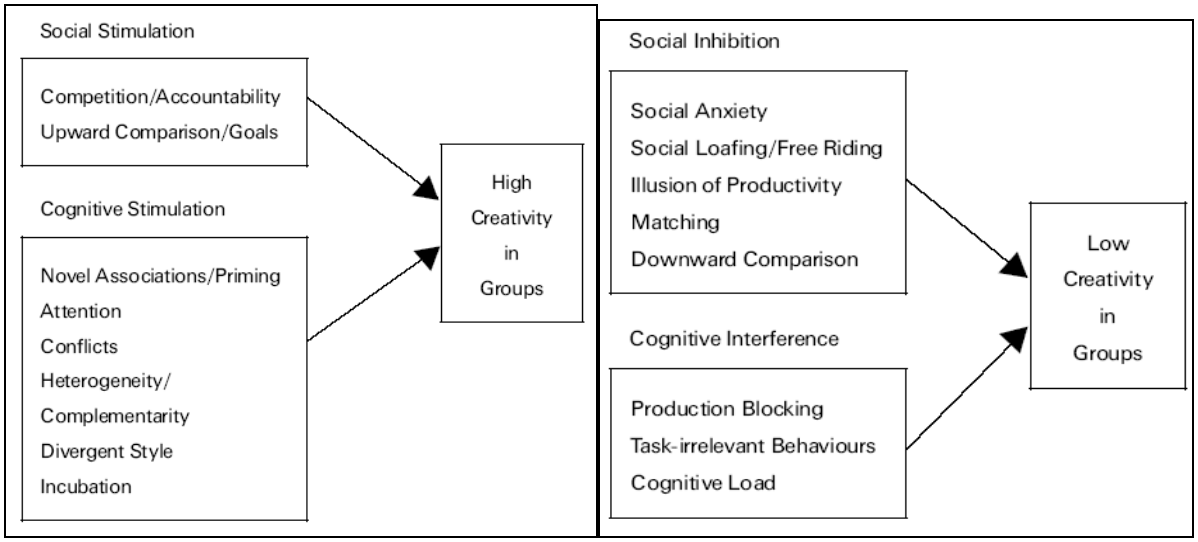

Figure 1. Factors affecting creativity (Paulus, 2000, pp.242 & 244)

Particular emphasis is placed by scholars in the composition and characteristics of the group. It has to be cooperative, to have diversity in attitude and in the socio-cultural background and broad minded in problem solving (El-Murad & West, 2004). The uniformity in the composition of the group and social cohesion among its members, above some level has negative effects on ingenuity (Sethi, Smith & Park, 2001). Cultural diversity plays an important role, as it enhances creativity, which is interaction between humans and the environment and makes sense within a specific system that considers and evaluates, because what is considered creative in a particular context, should not be taken for granted that will be considered as such in another context (Simonton, 2000).

From a great variety of definitions and strategies proposed, one can have the impression that creativity is extremely difficult. On the other hand, one might think that this diversity is a measure of the ease with which one can develop his own techniques.

Virtual environments

When referring to the concept of creativity the concept of the original and the innovative comes to mind. Although it is a personal attribute, it can be developed using the means provided by the new technological environment (Nemiro, 2001).

Increased capabilities of communications and information systems have played a very important role in the development of virtual environments that dictate the redefinition of the operation of organizations, businesses, labor practices and diversify the nature of markets, trade and social relations.

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The term "virtual environment" is used to define the environment where users are physically or temporally dispersed and to describe on line gatherings of people with a common interest in a topic or product. For example, members of the virtual community action (community of practice) of Linux use digital media and discussion groups to solve serious programming problems, although they might have never met face to face (Watson-Manheim, Chudoba & Crowston, 2002).

More specifically "Networked Virtual Environment" is a system that allows multiple users to interact simultaneously in real time, free from spatial and temporal constraints, in order to provide the participant an increased sense of realism. Within the virtual world, every user gets a three dimensional form, thus is visible to others using the graphics program available. All users of a virtual world have a sense that they share the same space with other users. Moreover, they have the potential to interact with both the objects of the virtual world and each other.

Virtual environments and virtual teams

Globalization of market, business and the new need for tackling competition, dictated practices that adopt flexibility and innovation. This led to the development of attractive virtual environments (Hassouneh & Brengman, 2008). Innovative practices that are applied the areas of labour, education and communications, revolutionizing the traditional models, reorganizing modern society. When Marchal McLuhan in 1960, foresaw the "global village" in fact he was talking about the extended and dispersed virtual workspace.

Although the characteristics of virtual worlds refer to game, precisely because of this game – like dimension, they can be exploited by companies or organizations to motivate employees and to engage them in virtual work environments with positive results in the completion of the projects assigned (Dixon & Panteli, 2010).

Second Life as a virtual three-dimensional environment

SL is an immersive three-dimensional virtual world, created entirely by its residents, a society with millions of registered users of a huge virtual land (Hypergrid). It was developed by Linden Lab, on 23 June 2003. It is accessible via the Internet and includes anything that human imagination can create: landscapes, mountains, lakes, cities, universities, shops, offices, sports centres, art galleries, cultural centres, businesses and others. On average there are about 50,000 residents in world at any particular moment and about half million the last week, while the total signups in February 2013 were about 32 millions (http://secondlife.com/xmlhttp/secondlife.php). Every user has the potential to buy "land" and create ones' own island.

Although creators and users of virtual worlds have differences, similarities are more important. SL contains typical elements of many virtual worlds[1]. It differs from versatile online role-playing games, known as "MMORPGs" (Massively Multiplayer Online Role Playing Games), since it has no missions, specific objectives and difficulty levels. Registered

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users can socialize, be integrated into social groups, participate in joint activities, exchange digital three-dimensional objects, or build their own using the tools of the program.

Within the virtual world of SL, each user is represented by an avatar, a figure created and modified by its owner and the level of its plausibility depends on the graphics' capabilities of the computer. When logging in SL each user can hear what avatars of other users say, chat to send instant messages, make gestures, walk, run of fly. SL can display desktop applications, web sites and files that a user has on his computer.

It is no coincidence that large numbers of organizations, businesses, successful individuals, universities and even religious organizations operate in this virtual environment, which although is not a game, it has the attractiveness of MMORPG. It is a unique digital world, putting tools in the hands of its users and providing them with integrated tools to build three-dimensional digital content, written text, an easy character creation system and methods for exchanging data with the real world. SL allows its users high interactivity, resourcefulness and creative "genius", (Stevens, 2007). SL opened its gates to creativity and imagination, which transformed particularly in the area of entrepreneurship and education and enable its users to experience them.

Discussion and conclusion

Lehtonen, Hyvönen and Ruokamo (2005) showed the significance of emotion for the processes of teaching, studying and learning. They found that the essential factors to be accounted for in planning and offering online teaching and studying include reducing the students' mental load and situational anxiety. It seems that a pleasant virtual environment, like a virtual world, may be successful in that aim, functioning not only as source of motivation, but also as support of learning.

The concept of creativity, in the concept of "creative capital" introduced by Florida (2002), constitutes a new model of communication and interaction, because a key feature is the creation of new forms of products, strategies, relationships, that incorporate innovative solutions and new ideas. The introduction of SL in cyberspace is the result of a general framework, imposed by the new socio-economical and technical conditions, that seems to attract groups of creative people that make up a dynamic economy.

According to Florida (2002) aesthetics are a key issue. The economy of SL is an "economy of aesthetics" and as such requires creative skills. The quick feedback and interaction, and the aesthetics of SL may also be a motivation for the expression of creativity, as the strongest the immersion in the education process, the most effective the results of collaboration and the learning outcomes. So the social process-oriented online studying offered by a collaborative virtual environment may bridge the physical and emotional distance among the members of a classroom reducing the transactional distance.

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Creativity becomes a key factor that has to utilize the tools provided by the virtual world in order to attract residents. It has been observed that the more attractive and unconventional methods used in the real world advertising and marketing, the greater the success of the action. The same applies to the virtual world. Furthermore, the process of manufacturing objects is a creative process. Digital creativity can be recorded in construction, art and the variety of the natural landscape, without taking into account the purely artistic events such as concerts or exhibitions of artifacts, although for many, they are difficult tasks requiring increased skills and special technological skills (Messinger et al., 2009).

The emotional state of the student and the enhancement that comes from joy and satisfaction due to the virtual environment, have to be taken into account very seriously, as they may contribute to the development of creativity of students and teachers. Learning with pleasure may free hidden powers from the human mind, constructing a better future for all of us.

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UP TO A 5 STAR LEARNING ENVIRONMENT! A SHORT REFLECTION ABOUT EDUCATIONAL CHALLENGES FOR 2013

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Abstract

Trial and error, research and evolution took us to as to a solid level of education in general. Education has gone through huge changes since the sixties… Yet, there are still some interesting challenges. Check out with me 5 major suggestions to create a future proof instructional and curriculum design…

Forget about learning outcomes

Honestly, I'm bored… to hear about learning outcomes. For too many years now, people have been focusing on this as if it is or can be the (only) drive for good education! From the Ministry of Education to universities, headmasters, teacher trainers, teachers... everybody worries about refining, updating, implementing learning outcomes. Is there any scientific proof of extra added value centring your whole educational project around learning outcomes?

Sorry, for me it's enough,… forget about learning outcomes! Why? In my opinion, learning outcomes are pretentious, unrealistic, endless listed, useless and simply creepy for students. They do not match with diversity of the learners and complexity/reality of the context.

Our educational system is – or should be – ready for a decided shift towards a more humanistic, holistic and organic approach of learning environments. A first step in the good direction is leaving the learning outcomes for what they are. Don't waste your time and just **draw some general competences** based on the well-known BLOOM-matrix: goals, aims for knowledge, skills, attitudes…linked to your discipline / course / training. Put your energy in what really matters, the next stars,…

"Engage me or enrage me"

Try to **engage the students in the whole cycle of the learning process**. Nowadays it's very common to engage the learner in the learning activities with assignments, group work, collaborative tools and tasks. Good! Of course!

However, three interesting challenges remain and they are situated, where you would less expect them: in the preparation and the tail of the learning event… (let's call it an event: the course, training, methodology, interaction,…)

First **take your time to draw together at least some essential competences**. Work together on an agreement about the competences you want to explore together. Avoid the word "learning", I prefer to talk about observation, exploring, investigating,… It helps to get the right trigger and spirit for lifelong learning.

The second recommended mutual engagement can be **the design of the learning event**. Ever wondered why the teacher always prepares his class behind the screen and then rolls it out in the classroom? Peekaboo?! What if you take some time to explore possibilities and approaches together with the students? From voting on some different designs to creating from scratch the steps towards the perfect learning environment. The win-win is the mutual learning effect and the honest sharing of responsibilities.

The third challenge and, probably the most difficult one – because it is a delicate matter: engage the student in **the design of the assessment**. I'm not referring to the questions – although could be – but about when, where, how (…) the assessment will take place. Shape the assessment together and, the trickiest level, assess your assessment together!

Think Deming

We are overwhelmed by pedagogical and didactical models, theories, instructions. Especially for starters in the educational and training world, it's rather confusing how to deal with this overload of pedagogical information. Luckily enough, there still exist simple tools to help us to raise effectiveness. Remember, KISS: Keep It Simple (and Stupid – but I don't agree with this extra 's'). The best theoretical models are modest and a very good example is the Deming circle.

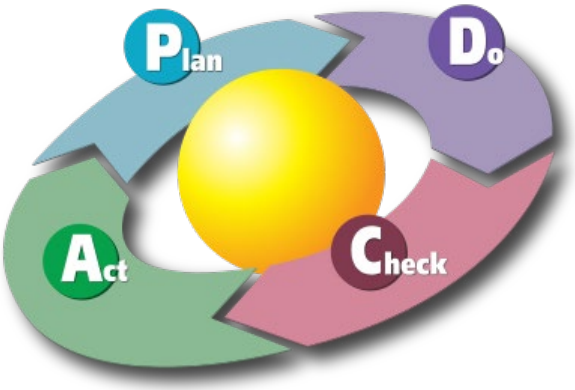

Figure 4. Deming circle

Plan-Do-Check-Adjust are your instructional and curriculum design and engage the learner in each step you make. This model for reflection is well known in its applications of Quality Management but it is a perfect and in fact a wonderful basic tool for the instructional

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designer. Whenever and whatever you undertake: think PDCA! Think Deming and link, connect, and realize each step of the PDCA with the learner. Check this simple framework on different levels: a single activity, a course, a series of events, a curriculum design,… In the literature the circle is Plan Do Check **Act** but I prefer Plan Do Check **Adjust** to avoid the confusion between Act en Do.

Using the Deming circle is very 21st century because it is concrete and yet holistic enough to be applied and transferred in very different (educational) contexts. It confirms that learning is a process and integrates different learning theories. It is a simple key to better quality. The philosophy of running over and over the PDCA together with the students, is much related to the challenges in stars 2, 4 and 5.

Make learning exciting

Creativity is the drive and the spirit to establish an attractive and exciting learning environment. An attractive learning environment leads to the second star: engaging the student.

How to make learning exciting is, however, a very tricky question. Books and books have been written about the added value of using new media. Well, OK. Although,… don't get lost in games, social media, learning management systems and other digital torture… More or less the same situation occurs with methodologies. Books and books about new methodologies. Well, OK. Very inspiring but once again, some trainers get dragged into a flashy whirlwind of methodologies…and so do…the learners!

Don't get lost in the wood, never able to find the treasure… Making learning exciting is not about trying out as much as possible, using loads of tools and methodologies you don't connect with… It is all about **the right and well-balanced cocktail of approaches and methodologies**! Not flashy but eclectic. This will make the learning effect stronger.

Interconnect

Try to connect, or even more: interconnect! Star 1 – 4 are about connecting too, but there is more… There are 2 dimensions and 3 different layers in this connection. That's how it became… an interconnection.

A first dimension or connection is the connection with the learner. **Try to connect with the learners' 1) Experience 2) Talents 3) Learning style**

Those three are interrelated and that's not a coincidence.

Connecting with the experience is really taking into account the knowledge, skills,… the student masters. Connecting with the talents will bring out the best of the learner. What are his/her strengths, natural talents/gifts,… Taking into account how he/she learns best is

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connecting with the learning style. Creating a learning environment where you connect with those three layers is very motivating and will bring a perfect leverage for effective learning.

The second dimension is not less important… the connection with yourself. **Connect with your own** 1) Experience 2) Talents 3) Learning style. This is very similar to what is mentioned in the 4th star: it doesn't make sense to use methodologies or media you don't connect with.

Creating a rich learning experience is guaranteed when you make the event a celebration with your experiences, your talents, and your learning style. The whole picture makes your own proper teaching style and it is important to figure out exactly what it is. This self-reflection will bring out the best in you. Very often teacher trainers will try to make you do things you can't do. Or worse, things you really shouldn't do. Once you know who you are, what you're good at, what kind of teacher you are, how you learn/work better, you'll find the right flow to make the first layer of the dimension stronger.

In search of the right learning leverage, we can summarize that the right way to a 5 star learning experience involves also **connecting your strengths to those of the learners**. This will generate the best basic conditions for learning: support, feedback and challenges. In a 5 star learning environment… we should aim for individual matches. That's when learning becomes really exciting, for both, the teacher/trainer and the learner. And that's exactly how it should be. In the end, both are learners!

Reflected?!

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THE SCIENTIX OBSERVATORY: ONLINE COMMUNICATION CHANNELS WITH TEACHERS AND STUDENTS – BENEFITS, PROBLEMS AND RECOMMENDATIONS

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Abstract

Scientix, the European Commission's DG Research and Innovation's community for science education in Europe includes since January 2013 the Scientix Observatory which aims to provide short overviews on a number of topics related to Science education projects. This paper concentrates on the format, benefits and problems encountered in communities of practice (CoP) and chats carried out by four projects: inGenious, Xperimania V, DESIRE and FuturEnergia. While inGenious' CoP last six weeks, DESIRE's CoP are only three days long. When looking for answers to specific questions, the DESIRE format works better but requires the information to be completed by shorter events or face to face workshops. When tackling general topics, longer CoP open all the time and facilitated by teachers, ensure the participation of teachers. inGenious and Xperimania V chats have experts replying via audio, while the FuturEnergia answers from the experts provided in writing, are better for schools with older technical equipment. The most efficient chats are carried out with a maximum of two experts, address up to 20 classes (400 pupils) and the chats have associated either an additional activity (like a competition) or the transcript which furthermore serves as an additional teaching resource.

Introduction

Scientix, the community for science education in Europe, was created to facilitate regular dissemination and sharing of know-how and best practices in science education across the European Union. Scientix is open for teachers, researchers, policy makers, parents and anyone interested in science education. Scientix collects teaching materials and research reports from European science education projects financed by the European Union under the 6th and 7th Framework Programmes for Research and Technological Development (Directorate General Research), the Lifelong Learning Programme (Directorate General Education and Culture)

and various national initiatives (http://scientix.eu). Through a number of online and off-line services Scientix promotes a lively community for its users.

In order to help the development and dissemination of different science education projects Scientix has set up the Scientix observatory which provides on a regular basis short overviews on the state of play of different topics related to science education. These projects vary in duration, scope, audience and methodology, yet all of them include elements of e-learning and utilise various online technologies for education, communication, data collection and dissemination. This could provide a valuable insight into what e-learning methods work best and what conditions make them more likely to succeed in supporting science education in Europe.

We discuss here a sample of projects within the Scientix observatory, which despite their differences all use online communication as part of their educational activities with teachers (communities of practice) and/or students (chats). Since the projects differ in purpose, audience and structure, the online activities that they employ may also have very different themes, formats, timelines, participants and rules of engagement. We present here a few cases and draw some initial conclusions outlining the benefits and drawbacks associated with such online activities in each of the cases. A number of recommendations conclude the paper.

Sample projects

Four projects have been selected for this paper: inGenious, DESIRE, Xperimania V and FuturEnergia. We provide first an introduction to the projects and the chats / online events planned by each project.

inGenious

inGenious is the European Coordinating Body (ECB) in Science, Technology, Engineering and Mathematics (STEM) Education. It is a joint initiative launched by European Schoolnet and the European Roundtable of Industrialists (ERT) aiming to reinforce young European's interest in science education and careers and thus address anticipated future skills gaps within the European Union. Through a strategic partnership between major industries and Ministries of Education, inGenious has the objective of increasing the links between science education and careers, by involving up to 1,000 classrooms throughout Europe. With a grant of €8 million from the European Commission's 7th Framework Programme over a 3-year period, and the support of over 40 partners from 15 countries, inGenious is one of the largest and most strategic projects in science education undertaken in Europe (http://ingenious-science.eu).

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The inGenious project provides multi-faceted support to school educators of STEM subjects, which includes face-to-face and online activities. Teachers have access to various classroom practices in STEM education that were developed in cooperation with European business partners, including 10 online chats. Teachers can also participate in 18 Communities of Practices that help them improve the quality of teaching and learning STEM in their schools

DESIRE

The European project DESIRE (Disseminating Educational Science, Innovation and Research in Europe) aims to develop models of diffusion and exploitation to improve the dissemination of science education projects results to teachers. The DESIRE project (http://desire.eun.org) is carried out by European Schoolnet together with INDIRE (Agenzia Nazionale per lo Sviluppo dell'Autonomia Scolastica), Universitat Autònoma de Barcelona, Dansk Naturvidenskabsformidling and Ecsite (The European Network of Science Centres and Museums) and is funded under the European Commission's Lifelong Learning Programme (DG Education and Culture).

To collect information on different dissemination methods used in public funded projects and assess their effectiveness, DESIRE invites a broad range of stakeholders to share their experiences via five Communities of Practice. The participants of these online activities include science teachers, STEM professionals, science project planners, policy-makers, organisers of science events and organisers of activities and expositions in museums.

Xperimania V

Concentrating on chemistry and physics, Xperimania aims to boost young people's interest in science, which is a priority for Europe to remain a knowledge-based economy fostering innovation. Xperimania helps students in secondary school classes (pupils aged 10-20) and their teachers to understand the wide variety of applications of chemistry, and to learn how this fascinating science has contributed to the development of many day-to-day items. By participating in different activities students receive a unique opportunity to stimulate their scientific and analytical skills (http://xperimania.net).

In the context of Xperimania V "TALK2US", financed by Appe (The Association of Petrochemicals Producers in Europe – Appe) and EPCA (the European Petrochemical Association), four online chats and mini competitions are being organized between October 2012 and May 2013 featuring a number of topics and experts.

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FuturEnergia

Financed by Plastics Europe, FuturEnergia (http://www.futurenergia.org) is an educational initiative that aims to provide a neutral platform for discussion and debate on the benefits, pros and cons of materials that contribute towards energy efficiency.

FuturEnergia's programme includes hosting a number of online debates, calling out to high level experts and schools to discuss energy education by addressing issues such as energy savings, sustainable development, science education, environment, and innovation.

Communities of practice or Online Discussion Events

Both inGenious and DESIRE mentioned Communities of Practices (CoPs) in their programme of activities. CoPs are usually defined as a group of people who share a common interest and through the process of sharing information and experiences within the group, members learn from each other. Wegner (1998, 2006) explains that the topic or focus of interest of Communities are continually renegotiated by its members, implying a commitment to the domain, and are practitioners who develop a shared repertoire of resources.

The online events in projects like inGenious or DESIRE are rather "top-down" approaches with a pre-defined specific topic in which most participants have limited experience and thus, the relationships of mutual engagement in these events are not so common. Furthermore, the aim is to encourage the learning of all members of the community and not only to collect data (an aim stated by DESIRE, for example). For these reasons the CoP activities within the DESIRE project were re-named Online Discussion Events (ODEs) as the actual implementation of the activity did not correspond to a CoP from a theoretical point of view.

This terminology should have been used also in inGenious. Nevertheless, for sake of simplicity we will refer here to CoPs or ODEs depending on the project's choice of terminology.

CoP or ODE have the following characteristics in inGenious and DESIRE events.

inGenious

In the framework of the inGenious project the CoP were initially organized as online events lasting around six weeks each and based on collaboration between school and industry. Each CoP was led by an invited expert in the field, with a specific timetable for discussion over the 6 week period. The discussions were structured and led by the expert in forum format, and resulted in a report describing the conclusions of the CoP. The participants in the CoPs were teachers, teacher trainers, policy makers and other relevant stakeholders.

Each week of an inGenious CoP a different topic was introduced connected to the CoP's general theme. Every Monday and Thursday a specific subtopic and associated questions were revealed and served to guide the discussions. Every Sunday, the previous weeks' discussion

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forums were closed as to recap the participation to the week's topics. The blunt of the moderation fell on the expert.

Two main problems were encountered:

1. experts not having enough time to answer all the participants' questions or knowledge on how to keep online discussions flowing;
2. reduced participation overall as it took a while for the CoP to be known to the teachers and by the time they joined the first weeks were closed and new visitors felt unsure about joining straight into weeks three or four, for example.

After 5 CoP following the structure described, the following changes were implemented for the new CoP:

1. The topics of weeks one to four were revealed from day one and left open throughout the six weeks.
2. No new topics were introduced during the last two weeks.
3. Two teachers were appointed as moderators / facilitators for each CoP.

The number of teachers that actively participated in the inGenious CoPs by the 4th of February 2013, the number of posts per CoP and visits received are presented in Table 1.

Table 1: Number of teachers participating actively in the inGenious CoP, posts and visits received.

CoP	Experts	Teachers	Posts	Views[1]	Avg[2]
Cycle 1					
Technology	FutureLab	27	151	7854	5.6
How to contact companies	Jet-Net	18	95	3171	5.3
Scratch and ICT	DGE	35	224	8102	6.4
Solving companies' problems	DNF	45	140	6753	3.1
Types of school-industry collaboration	NVHUS	21	82	1539	3.9
Cycle 2					
Future inGenious Activities	EUN	60	231	6267	3.9
Practices workshop	EUN / teachers	45	214	2372	4.8
Technological knowledge in the classroom	teachers	40	250	1735	6.3
Using Astronomy as an aid to teaching STEM[3]	Blackrock Castle Observatory	57	270	3474	4.7

As it can be seen, comparing the first CoP (Cycle 1) to the CoPs after the introduction of the changes described (Cycle 2) the average number of teachers that actively participated increased by over 70% as well as the number of posts left. On the other hand, the average number of visitors decreased by about 35%. The possible explanation would be that the topics were more specific and less relevant to the general teachers. Nevertheless, Cycle 2 CoPs showed a clear increase of active teachers, and fewer passive participants.

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DESIRE

The ODEs in DESIRE are used to facilitate the sharing of experiences between participants in the project and were organised in five categories corresponding to the number of target groups, namely: project managers, teachers, policy-makers, organisers of science events and organisers of activities and expositions in museums. Four separated discussion events were to be organized per target group of 3-days each.

Partners tried different formats for the ODEs and exchanged experiences on the technology/methods used. For science event planners it was found that the LinkedIn community of professional was more efficient as more members of their target group were reachable through this channel. In the case of science museums representatives, after an unsuccessful three-day ODE based on forum discussions, the ODE was re-organised as two one-hour webinar sessions using Google Hangout as this fixed timeframe seemed more adapted than an open ODE in the DESIRE website.

The ODEs for teachers and project managers were carried out online using forums and achieved somewhat more success in terms of the initial DESIRE expectations. In Table 2 we show the number of participants that contributed with posts to the ODEs and the number of posts left. The ODEs were expected to bring between 15 and 20 participants each time and provide all the information required for the research to be carried out within the project on dissemination of science education projects. In this sense the project partners decided it was necessary to complete the data needed with face to face events. On the other hand, as it can be seen in Table 2, while the number of participants is lower in DESIRE than in inGenious, the average number of comments per participant is larger (6 comments / participant compared to the average 4.9 of inGenious). One should also note that DESIRE ODEs last only three days while inGenious CoPs six weeks.

Table 2: Number of teachers participating actively and posts submitted in the fours DESIRE ODEs.

ODE	Teachers	Posts	Avg[4]
1st Teachers' ODE	13	76	5.8
2nd Teachers' ODE	12	59	4.9
1st Project Managers ODE	12	91	7.6
2nd Project Managers ODE	6	33	5.5

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Online chats

Online chats with students are part of the programmes of three projects inGenious, Xperimania V and FuturEnergia. These chats have either a slightly different format as we will show for inGenious vs FuturEnergia or have different additional activities associated with them, e.g. Xperimania V.

inGenious

During the inGenious project live online chats with representatives of industry, school guidance counsellors, etc, are organized. These chats display role models in industry, discuss career development in STEM and also other topics connected with working in STEM careers and STEM education. They provide pupils a more informed image of jobs and careers in this area. These chats consist of real-time, synchronous, online discussions between an expert in a particular topic and several classes of pupils. The information on each chat made available to schools before the event will include: topic of the chat, name of expert(s) and expertise; and one page description on the topic by the expert.

Schools are invited to register to the chat of their choice and prepare questions for the experts before the chat. During the chat, while the expert uses a microphone to reply, the audience types the questions. The questions then appear on the screens of all the participants and are answered by the expert(s). After each chat, a summary of the event is written up with the key lessons on the topic discussed and the type of questions asked by the pupils. Additionally, a link to the recorded event is made available for those that were not able to attend or for the teachers to carry out follow-up work with their classes.

Xperimania V

Xperimania V chats are organized the same way as the inGenious chats. Background reading and supporting materials (e.g. video) are prepared by the experts for the teachers and students to go through a few weeks before the chat. This way, students are able to inform themselves about the topic and prepare questions for the experts beforehand. The chats are led by one to three experts and last one and a half hours. During the chats, students/classes and the expert(s) connect to the online tool and communicate through it. Students are able to type their questions to the expert(s) which are visible to all the other participants as well. The expert(s)' answers are broadcast through a webcam including audio. A transcript of the chat is made available online during the weeks following the chat.

The main difference with the inGenious chats, are the competitions attached to the chats. Right after each chat, a competition is opened for one month where students are invited to submit a "lessons learned" document explaining how the corresponding chat fits into their curriculum, how it broadened their horizons, what they learned from the experience and how they could implement their learned lessons in their lives. For each competition a jury selects

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the three winners who receive a prize, along with their teachers. The aim of the competitions is to help get the messages of the chats across and avoid them being isolated events.

FuturEnergia

The FuturEnergia chats are online activities which involve an expert and a group of selected schools which gather in an online chat room to discuss relevant themes. The chats are based on a set of related online resources that enable them to prepare and discuss the topic in the classroom and decide what questions they wish to ask during the session. In the FuturEnergia chats experts reply to pupils' questions in writing and neither audio nor webcam are available.

The main outcome of this activity is a chat transcript that is published on the website. The transcript allows website visitors to find out more about the topic and the online discussion. It can also be used as a teaching tool to support further discussion in the classrooms.

Overall results of the chats

Between March 2011 and the end of January 2013, 14 chats were organized within the three projects mentioned. In Table 3 we have summarized the total number of chats per project, the total number of attending teachers and classes, the average number classes per chat and the average number of students per chat assuming each class consists of 20 students. It is important to note both inGenious and Xperimania V target around 20 classes to participate per chat, while FuturEnergia prefers between 8 and 15. This is justified as it is quicker to reply to questions out loud than by typing the answer like is done in FuturEnergia. All three projects make sure to reply to a minimum of one question per school during the sessions, to prevent pupils' disappointment.

Table 3: Chats organized within the inGenious project (ECB), Xperimania V (XPV) and FuturEnergia (FE)

	Number	**Teachers**	**Avg[5]**	**Students[6]**
ECB	7	144	21	411
XPV	2	43	22	430
FE	5	69	14	276
Total	14	256	n/a	1117

Qualitative feedback received indicates that:

- A preference towards fully written chats in case of schools with low technical equipment (as audio and webcam require more bandwidth and better computers).
- The optimum number of experts per chat is two, preferably with complementary knowledge in order to avoid repeated answers and to ensure a reduced response time.
- An average of 25 questions are replied to per chat, so chats work better when the number of classes participating is not larger than 20.

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- The technical problems increase if the participants are allowed control over their microphones. It is better to disable this option for participants.

Conclusions

It is generally difficult to ensure active participation in online events. In the case of Communities of Practice or Online Discussion Events for teachers, it is recommended to keep them running for a limited but considerable time (around one month) and to involve other teachers as facilitators. Experts should have the topics for the whole events well prepared in advance and be ready for very different and sometimes surprising questions from teachers. A different format worked best for the themed online discussion groups when specific answers from the participants were sought. In such cases a short-term focus group of maximum 2 hours could ensure the best outcome.

For chats, between 10 and 15 participants are recommended in the case of written chats and between 15 and 20 participants in the case of chats including audio and a webcam inputs. A maximum of two experts is sufficient in both cases. If the participants are students, allowing the use microphones by the participants could be detrimental and this practice should be strongly discouraged.

Further data will be obtained as more projects with chats and CoPs or ODEs are reviewed as part of the Scientix observatory, which will complement the results reported in this communication

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[1] Total number of views of the posts of each Communities of Practice (i.e. times the threads were read).
[2] Avg = Average number of posts per teacher
[3] CoP with two weeks to go still at the time of writing this paper
[4] Average number of posts per teacher
[5] Avg = average number of tclasses per chat
[6] Average number of pupils per chat, assuming 20 pupils per class/teacher.

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ICDE-EDEN JOINT WORKSHOP ON OPEN AND DISTANCE LEARNING FUTURES: THE INCREASING SOCIETAL IMPACT OF ONLINE EDUCATION, DEMANDING LEADERSHIP FOR CHANGE

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Driving forces for Open Knowledge

Societal needs, costs, students' needs, technology and Open Educational Resources are driving forces for open knowledge. But development is not straightforward. The demand for higher education means 4 universities with 30000 students a week for the next 12 years. The expectations for higher education to create personal and societal economic growth are high and increasing, at the same time 650 million youths are not working, not studying. Higher education must connect to employment to live up to expectations and needs. The cost of higher education has become a key issue, in the US, in the developing economies, in Europe. Open and online education has the potential to lower the costs, some claim by 70 – 80 %. Access to technology and the Internet revolutionize the opportunities for learning. By 2020 70 – 80 % of the world population is expected to have Internet access, up from 35 % today. Technology facilitates Infrastructure 2.0: eInfrastructure, Science 2.0: eScience, Campus 2.0: eCampus, Education 2.0: Open and online education. At the same time automation pushes people out of jobs, and more education is needed to re-educate people to high skilled jobs. Open Educational Resources, OER, promises the opportunity for the first time in human history to enable everyone to attain all the education they desire, but Open Educational Practices struggle to take of. The current models for higher education lack incentives for OER, lack incentives for Open Access, is not optimised for Open Knowledge. Students increasingly demand flexibility in education, so they can enjoy high quality education anytime, anywhere to low costs, but still the current paradigm of higher education still delivers on campus education through lectures.

Agenda for change

Universities are in a crisis, a crisis of hegemony, a crisis of social legitimacy and an institutional crisis (Amaral, 2002). Imma Tubella (2011) suggests a forth crisis, the generational crisis. Tubella calls for concrete innovation of the university: Turning the university upside down.

On top of that, the situation within higher education and the dynamics of the driving forces for open knowledge, create good conditions for disruptive innovation in higher education. Disruptive innovation (Christensen 2003), means that old providers and modes of delivery in an open market might be out dwarfed.

Massive Open Online Courses (MOOCs), initiated in North-America, is an example on disruptive innovation shaking higher education. The break through of the Massive Open and Online Courses, MOOCs is one of probably many significant game changers for higher education in the years to come.

However, voices are raised against MOOCs for hijacking the Open agenda, creating a the education death star (Caulfield, 2013), while others see it as the road to salvation, nothing has more potential to unlock a billion more brains to solve the world's biggest problems (Friedman, 2013).

The waves from disruptive initiatives can be seen as threats or opportunities for change, opportunities that stronger than ever before call for an agenda for change.

Models and framework for open, distance and online eLearning

In this context, open, distance and online eLearning may be the only sustainable way of meeting a more complex and diversified future. In Europe, the growing success of open online education is closely interlinked with its capability to meet the demanding societal challenges of the current decade. However, the development of holistic, workable and relevant frameworks that are transparent and not overly bureaucratic are imperative to the success of open and distance learning and realisation of its benefit for students and its contribution to the solution for mounting education pressures. Governmental, cross-border, Inter-agency and inter-institutional collaboration will all be necessary to fashion a robust framework and public profile for open and distance learning.

While reflecting on the driving forces and the probable outcome, what are possible scenarios for the 2020 university model? To support the discussion on future models, we in Figure 1 show the TEL-Map UK HE context scenario matrix. The four scenarios are not seen as predictions but as plausible possibilities.

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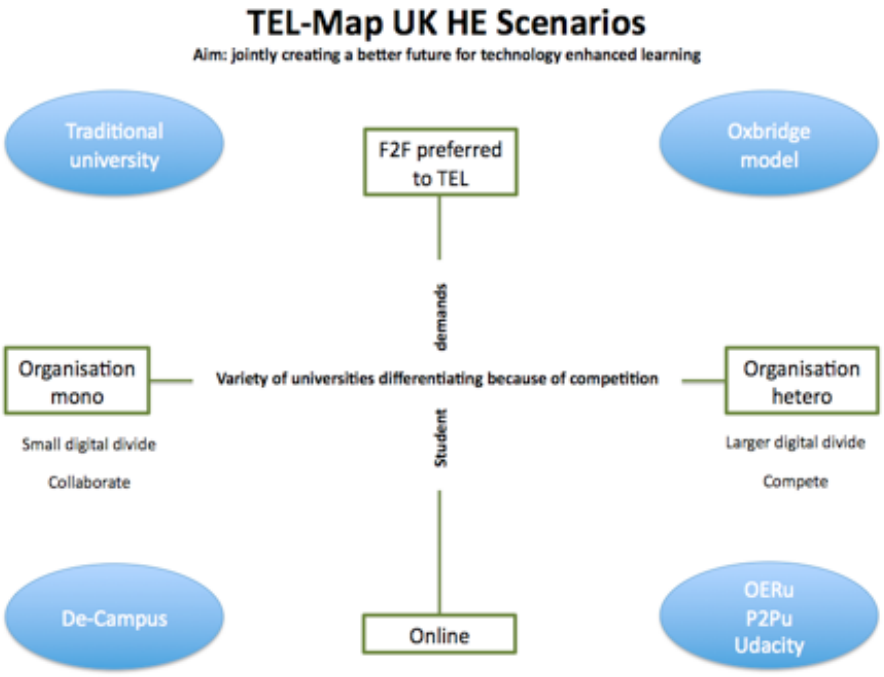

Figure 1. TEL-Map UK HE context scenario matrix
(source: http://www.learningfrontiers.eu/?q=content/context-scenarios-task-7-2)

The discussion

To contribute to this pivotal discussion, ICDE and EDEN have joined efforts and resources. As a preparation for the upcoming ICDE SCOP 2013: Leadership in the Time of Openness: Sustainable visions, Innovative Strategies and Creative business models, 28-30 November, Lisbon, Portugal, ICDE has recently produced a policy briefing suggesting how open and distance learning can help meet the increasing demand globally for higher education and whether regulation, or its absence, advances or hinders this agenda. Some initiatives that need to be put in place for advancing open and distance learning as a solution have also been outlined. This contribution will be a part of the background for the discussion among stakeholders and the EDEN Fellows as the European think tank for Distance and E-learning. In fact, the Fellows have been addressing in recent years the future development of open, distance and e-learning in face of the emerging societal challenges. At the EDEN 2012 Annual Conference in Porto, in a dedicated workshop, a number of alternative visions were presented and explored a set of alternative scenarios for e-learning in Europe in 2022 with the participants.

At the EDEN 2013 Oslo Conference, ICDE and the EDEN Fellows will organize a debate on the increasing societal impact of online education and how the future scenarios should be meet by policy and institutional strategy. This workshop will be a preparatory discussion of the debate to be held at the ICDE, EDEN and UAb jointly organized SCOP 2013 conference, Leadership in the Time of Openness. Workshop moderators will introduce the topic and ICDE's Policy Brief. The document will be commented by a number of EDEN Fellows.

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Afterwards, workshop participants will be invited to discuss the document and the Fellows positions. At the end, the workshop moderators will submit the conclusions, which will later discussed at an EDEN Fellows facilitated debate to be organized at the SCOP 2013 conference, with contributions from all regions of the world.

About the coordinators

The International Council for Open and Distance Education (ICDE) is a global non-governmental organization (NGO) with consultative partner status with UNESCO, and shares that agency's key aim – the attainment of quality education for all - as stated in the Declaration of Learner's Rights and Responsibilities (SelfDesign, 1996).

The European Distance and E-Learning Network (EDEN) exists to share knowledge and improve understanding amongst professionals in distance and e-learning and to promote policy and practice across the whole of Europe and beyond. EDEN is a not-for-profit organisation, open to institutions and individuals dealing with e-learning, and – more broadly speaking – open and distance education.

Questions for the workshop

Q1: Is the higher education system broken, or partly broken? And if yes, could it be fixed?

Q2: What do you see as the most probable scenarios for Higher Education in 2020?

Q3: What is "to the better"? What is a wanted direction? What future landscapes of Higher Education would you like to see? What would you not like to see?

Q4: What are the characteristics and the values for a wanted future quality Higher Education System for all?

UNESCOs "Education for All" establish some goals and values that are shared among a wide community of educators, stakeholders and associations.

Some important key words could be pinned down:

- Quality Higher Education for all;
- Access to Higher Education;
- Low cost for the learner.

But the Higher Education System also needs to:

- Connect to all the (potential) learners;
- (re)connect to jobs;
- Secure skills needed in the society;
- Recognize students as a driving force for change;

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- …….

Q5: To move in a wanted direction - What are the key issues for each layer?

When analyzing the framework for change in Higher Education, a distinction made by Looi et al. (2011) could be useful. They characterize three levels in the education sector: macro, meso and micro. At the macro level are Ministries of Education and policy-makers, who dictate plans for nationwide implementation and devise strategies for sustainability and scalability. On the meso level are research institutions, telecommunications providers, information technology (IT) companies and non-governmental organizations (NGOs), who produce research, advise policy-makers, and provide technology and infrastructure. At the micro level are school leaders, teachers, parents and students, who enact policies and programmes in schools and classrooms.

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FOSTERING A STAKEHOLDER MODEL IN ONLINE LEARNING TO PROMOTE INFORMED SOCIAL ENGAGEMENT

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Introduction

The traditional student-teacher relationship is rooted in a time and space paradigm (Aoun, 2011). The historic system of place-based learning established the expectation that real learning occurs only when one is in school, where students gather with a teacher who bears responsibility for guiding the learner through a process and toward a predetermined outcome. This has been described as a *banking system* of education (Freire, 1993) whereby the teacher serves as the depositor and the students as depositories of knowledge. Deposits and withdrawals of knowledge are exchanged at fixed points in time and location. E-learning in formal academia has moved away from the static nature of such exchanges, but has largely held onto the traditional route of information transmission. However, the inherent problems of educational banking become magnified in the vast information stream available to students online. Teaching is embedded with personal perspective and bias and this too is often 'deposited' into students. Teachers are not politically neutral; they set an agenda, highlighting what should be valued and what discarded. Instructors seeking to actively engage student in the learning process are often faced with conflicting information presented by students, and then find themselves in the difficult position of justifying their position or defending a singular point of view. As a result, students are relieved from the process of discovery and of the critical evaluation of information as it unfolds before them.

The Emancipation of Learners

One of the challenges currently faced in online learning environments is the attempt to reach learners by transposing place-based teaching methodologies into an online forum and expecting an equivalent level of success. This is rarely the case, as pedagogy changes along with the learning platform. Pedagogy must therefore drive the use of technology in order to better prepare students to engage in an increasingly complex world (Cartwright, 2000). To maximize online learning, emphasis must be placed on identifying pedagogic avenues to promote synthesis and evaluation within a global, information-based society rather than locating the newest and best technology tool or mechanism of discovery (Shovein, Huston, Fox & Damazo, 2005). Regardless of whether the aim of online learning is to obtain training

for a specific field of employment or to amass broader knowledge of avocational interests, learning is enhanced by utilization of critical thinking and evaluation of available information. As such traditional learning methodologies are ineffective as they do not promote reflective reasoning. Paradigms for online engagement are shifting in response to these criticisms, and it is important to consider the broader responsibility of global engagement which builds upon the foundation of contemporary pedagogies. One pedagogical change that merits strong consideration is a removal of the hierarchical teacher-student learning process in favour of a distributed information-seeking process.

Rather than conscribe to the established roles of teacher and student, a shared role of "stakeholder" is proposed to better describe the collectivistic nature of information gathering and appraisal. The concept of a stakeholder of learning outcomes implies that everyone is engaged in the same process, and that there is a shared sense of responsibility in both learning and teaching tasks (Cook, Holley & Andrew, 2007). In order to promote a collective commitment for information seeking and critical analysis, the teacher must be willing to relinquish control and engage in an evolving dialogue and consultation with students. Each stakeholder is thus empowered to participate in a democratic learning process, developing an identity as both a learner and a teacher simultaneously. This process is readily supported by current learning platforms and knowledge acquisition skills can be easily transferred to broader levels of global civic engagement.

ICT established the concept of "anytime-anywhere" learning, allowing linkages to develop through mutual interests and goals. Social media has taken society a step further with the creation of an "all the time–everywhere" system, exponentially increasing collective knowledge and relationship building free from the parameters of time and space (Cook, 2012). Such a significant amount of time is now spent online that it has become the primary mode through which individuals develop a sense of identity and establish themselves within communities that are defined as a place where they "live". Thus, modern technologies promote distributed learning through a decentralized system, often without circumscribed boundaries. This affords individuals an unprecedented opportunity to *learn where they live*, and to communicate with those within their virtual community. By incorporating education fully into the online experience, stakeholders are empowered to critically appraise all content they discover in the online realm, fostering the capacity for debate and disagreement.

Modern web technology has moved away from portals and professional content creators to search engines, aggregators and user-based content, which allows for increased engagement and creativity. Web participants are active content creators and moderators, and as such assume both teaching and learning roles in rapid succession. Wikis, blogs, online offices, social bookmarking, video repositories, podcasting, social networking, and personal learning environments are the new tools that may be employed in online education (Karamat & Petrova, 2009).

By their very nature, knowledge and learning are social processes (Chatti, Agustiawan, Jarke & Specht, 2010). Myriad studies have shown e-learning must incorporate elements of

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interactivity and engagement in order to be effective (Pittenger & Doering, 2010; Seok, DaCosts, Kinsell & Tung, 2010). But in the rapidly transformational 'on demand' culture that exists online, learners also seek to personalize their learning experience and to become an active partner in identifying outputs. Self-directed learners seek environments that promote a personalized process approach to knowledge translation using non-linear modalities. Such methods support active learning and engagement in the evolution and synthesis of ideas (Deery & Smith, 2011). Thus, the life and work experiences of students become a valued component of the learning process (Shovein, et al., 2005).

Education as Transformation

Implicit within an online democratic milieu is the opportunity to engage in personal and self-directed learning and a responsibility to be open to alternate points of view. Transformative pedagogy encourages students to raise awareness and critically examine their assumptions, wrestle with social issues, and engage in social action (Cranton, 2006; Meyers, 2008). This process marries contemplation of the subject matter with self-scrutiny. Critical thinking can be encouraged through the sifting and winnowing of available online resources and through written assignments that help students self-reflect, connect experiences with social issues, and reach an understanding of course material. However, writings need not be shaped into long essays to show evidence of learning. Discussion pages, blogs and even Wikis can offer evidence of transformative learning. Adaptively allows learners to personalize course materials to suit their unique needs while meeting established learning outcomes.

It can be argued that a transfer of learning occurs in many forms of online exchange as well as refereed papers and academic textbooks. Social media sites have become the identity and 'home' of millions of users, and yet are often ignored in the learning process. But if stakeholders are valued for their ability to abstract and synthesize information, then social media is germane to education. Sites such as Facebook and Pinterest do not have to be solely about sharing photos and personal anecdotes. By instilling a culture that promotes the sharing of deeper and more substantial topics, knowledge translation can occur within any forum. Social media sites have been proven to be effective due to a reward system (i.e. Facebook "Likes") which encourages users to repeatedly visit the site. Incorporating such social reward systems within learning communities can help to further integrate learning into users' daily lives.

Learning as Social Duty

In order for learners to become fully engaged citizens, education must awaken in them an awareness of the full intensity of their selfhood and duty to the world around them. The dichotomy of social duty demands that learners simultaneously embrace their freedoms and acknowledge their obligation to choose moral and ethical lives amidst their own subjective presence in the world (Morris, 1966). In turn, instructors must appreciate the far-reaching potential of learning outcomes as more than a measure of right and wrong. This notion has

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been carried for the better part of a century and solidified in the words of John Dewey (1916): "Were all instructors to realize that the quality of mental process, not the production of correct answers, is the measure of educative growth something hardly less than a revolution in teaching would be worked." Yet in the massification of online education, it is too often brushed aside in favour of meeting arbitrary quantitative outcomes. Transformative learning, however is – and must – be rooted in personal appraisal of divergent ideas and opinions. For such reasoning to evolve, each stakeholder needs to be afforded the opportunity to engage in subjective evaluation.

A stakeholder's effective participation in society requires a certain level of knowledge and the ability to discern the quality of information sources. It is not surprising then that with the rise of public education and more widely-accessible educational materials there has been a corresponding rise in democratic governance around the world. Indeed, the basis for democratic society rests in the ability of all members of that society to participate equally. Equal participation requires that people take responsibility for their education. Today's society bears witness to the strains created by the availability of limitless sources of information that allow stakeholders to pick and choose only items with which they agree. This reinforces a hardening of opinions around widely divergent views of the world, and an inability among stakeholders to critically evaluate the reliability of the information they consume. There is an explosion of online sources of information, the sheer volume of which serves to confuse and distort one's view on a topic. Because of the ease with which information can be published online, there is a great incentive for sources with a vested interest in societal debates to put forward their viewpoint. This increase in available information can be a great equalizer for society, but only when paired with an increased ability to critically evaluate information and its sources for members of that society. Stakeholders are continually challenged to actively seek out and evaluate heterogeneous information sources, without prejudice or predetermined constructs. Stakeholder-driven educational processes can best prepare individuals for the challenges facing a global society.

Summary

Social engagement in the complex, all the time – anywhere information age offers learners an unprecedented opportunity to learn and teach simultaneously within a vast array of online environments. The use of a stakeholder model has been proposed as a mechanism for understanding the intertwined roles of teacher and student, recurring in rapid succession. As the stakeholder wades through multiple sources of information online, relevant abstracts are subsumed and shared back into the information collective to await the discovery by other stakeholders. This allows for knowledge to build in a cumulative manner and for personal interpretations of information to evolve with each passing iteration. The blurring of the distinction between information and knowledge in online education can have profound implications on the role of the stakeholder, particularly as educational objectives move from generating understanding of facts to acquiring functional knowledge about systems (Karamat & Petrova, 2009). The cyclical nature of stakeholder engagement promotes deeper levels of

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understanding through the process of refinement, reflection and critical evaluation. Thus, it is through this mechanism that stakeholders develop the skills to more fully participate in civil discourse and assume a rightful place in global contribution.

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INNOVATION AND OPENNESS THROUGH MOOCS: UNIVERSIDADE ABERTA'S PEDAGOGIC MODEL FOR NON-FORMAL ONLINE COURSES

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Abstract

In face of the recent but fast growing worldwide interest on Massive Open Online Courses (MOOC), many universities, both open and traditional, have being discussing strategies to implement this new format of educational delivery. The huge successes of the experiences from the top universities in the United States have been an inspiration, especially to European higher education institutions. Universidade Aberta, the open university of Portugal, has been the first educational institution to develop an institutional pedagogic model for open online courses, thus issuing an institutional standard practice model for MOOCs. This paper details the institutional rationale behind this initiative, describes the pedagogical approach used and discusses the main features of the model. Finally, the authors reflect on the possible characteristics of a European-style response to the challenge of massive open online higher education.

Introduction to Universidade Aberta's Virtual Pedagogical Model

Since 2007, Universidade Aberta (UAb) has in place a Virtual Pedagogical Model (Pereira et al, 2007) which establishes the standards for all its educational offering. The design and implementation of this model was part of UAb's institutional strategy for innovation in distance education, having played an inducer role of institutional transformation in the framework of UAb's transition process towards becoming a fully online university. This tool came to embody and represent a new organizational culture within the university, promoting the dissemination of the notion of networked education.

UAb's pedagogic model was developed in house by a multidisciplinary team of expert academics, mainly from the Education Department, and validated by an external International Advisory Board, chaired by Tony Bates and including some of the leading pioneers in the field of online education: Linda Harasim, Robin Mason, Ulrich Bernath and Albert Sangrà Morer.

The model is patented and consists on a cluster of institutional-wide pedagogical standard practices each dedicated to a specific type of educational programme or course. In fact, the model has different versions for undergraduate and graduate programmes, as well as lifelong learning curses. Although each version presents different characteristics, all share a common pedagogical identity based on the programmatic articulation of four principles: learner-centeredness, flexibility, interaction and digital inclusion. Additionally, the model states no teacher or tutor can teach without first being subject to a fully online immersive learning experience. The same applies to students who must take a two-week preparatory module, designed as a "familiarization" experience, the first time they enrol for a course at Universidade Aberta.

Being an institutional regulator of educational practices and at first a tool for radical innovation, the model itself was not designed as a fixed framework. On the contrary, it was intended from the start to be open and to constantly evolve in face of new pedagogical research and technological developments. The consistency of UAb's Virtual Pedagogic Model is based on its ability to respond to the changing needs and challenges of the community of its users, continuously improving.

In face of the most recent developments, most especially the development of social networking, mobile learning and open educational practices, UAb decided to review more extensively its virtual pedagogical model. A special in house expert team has been appointed to conduct the operation. As a part of that process, a new variant of the model specifically dedicated to open online courses was designed and is now under testing. This initiative marks the pioneering design of the first institutional pedagogical model for MOOCs.

Codifying Institutional Open Educational Practices: Why regulating innovation?

Do open educational practices (OEP) need to be regulated? Can it be done? In fact, many would argue that the culture of openly sharing educational resources is somehow contradictory with the imposition of standards and regulations that will necessarily limit the ability to freely use resources in innovative ways. However, this represents a misconception. From a technological point of view, universal accessibility depends on the compliance with common rules, a shared language. The same applies to the pedagogical approach. This means a process of standardization is compatible with open innovation processes such as the production and sharing of OER. We'll just need to use a form of open standards. This is a similar thing to what happens with licensing. The fact that an educational resource is openly accessible does not imply its intellectual property is not defended. Open licensing still is a form of licensing.

Currently, the most accepted definition of OEP describes them as practices supporting the production, use and reuse of high quality OER through institutional policies which promote innovative pedagogical models, and respect and empower learners as co-producers on their

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lifelong learning path. By defining OEP in such terms, some form of regulation has to be imposed. Because by using OER in institutional formal settings, the resources have to be subject to processes of quality assurance. This same conclusion was anticipated by Teixeira (2007) at the time of the debate in Portugal on distance learning legislation.

The decision that led UAb to try to regulate OEP is therefore a consequence of the strategy to coherently implement them across the institution. Innovation isn't limited by codifying practices, but this is the best possible way in our view to rapidly disseminate it.

Way finding through MOOC Territory

For someone recently arrived at the field, it would appear that MOOCs – Massive Open Online Courses – were the creation of some high profiles professors (Sebastian Thrun, Peter Norvig, Daphne Koller or Andrew Ng) from Stanford University. When Sebastian Thrun and Peter Norvig opened their "An Introduction to AI" course at Stanford, in the fall of 2011, to anyone who wanted to take it for free, an impressive 160000 plus people registered for the course. This unexpected event, coupled with the reputation of the professors and the institution involved, set in motion what would become the educational phenomenon of 2012 (Daniel, 2012). Soon after Sebastian Thrun created Udacity, a for-profit organization through which MOOCs can be offered, and Daphne Koller and Andrew Ng created a similar company, Coursera. By late 2012, Coursera had managed to partner with more than 30 top-tier American universities (and some from outside the US) to offer MOOCs, and the two companies combined accounted for more than 1 million participants registered to take their courses. Also in 2012, MIT announced a partnership with Harvard (they were later join by UC Berkeley) to develop EDx – a non-profit initiative to offer open online courses (Daniel, 2012). With venture capital supporting fast iteration and development and the media attention focussing on these high profile players, MOOCs became the hot topic of 2012 and are still going strong in 2013 in Higher Education.

MOOCs, however, existed before the Ivy League and Silicon Valley investors took an interest in them. The first MOOC bearing that designation was offered by George Siemens, Stephen Downes and Dave Cormier at the University of Manitoba, Canada, in 2008 (Downes, 2012; Daniel, 2012; Watters, 2012). The term MOOC was coined by Dave Cormier, after registrations for the course went past 2000 participants (Cormier, 2008; Siemens, 2012a). The "Connectivism and Connective Knowledge" course (CCK08) drew on the recent experiences by Alec Couros[1] and David Wiley[2] who, in 2007, decided to open the formal, for-credit courses they were teaching at their institutions to anyone who wanted to take part in them in a not-for-credit, informal way (Downes, 2012). So, in a sense, this first MOOC set itself in the larger context of Open Education and Open Educational Resources, following a practice of opening up to the world what were the results of regular academic work.

CCK08 was designed according to the connectivist principles of learning (Downes, 2012; Siemens, 2012c, Cormier, 2010). There was not a fixed body of content to be learned,

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"professors" teaching "students" or a single location where the course took place. Content resulted from the production of artifacts by participants, following their interaction with and their reflection upon a given set of resources (and other resources shared by them or by others), as well as the dialogue among participants around these artifacts; the organizers acted more as facilitators and providers of some necessary structure, with the "teaching" role being assigned to the learning community itself; and, while there was a course site, with the relevant information (weekly topics, list of suggested resources, synchronous session schedule, etc.) and Moodle forums where people could interact, the conversation was distributed by the participants' own spaces (mostly individual blogs) and several social spaces (Twitter, Facebook, Second Life, etc.).

Several other MOOCs were offered afterwards that followed this approach – CCK09, CCK11, CCK12, Plenk10, Critical Literacies 2010, Change11, LAK11, LAK12, Future of Education 2012, to name a few (Siemens, 2012c) – and consequently MOOCs came to be associated with a connectivist (or connectivist inspired) view on learning, based on a participatory pedagogy and on networked learning.

The pedagogical principles and practices followed by these MOOCs and by those offered through Udacity, Coursera or EDx are quite different (Daniel, 2012; Siemens, 2012c; Watters, 2012). So different, in fact, that using the same name to designate them is confusing (Hill, 2012). Downes proposed a useful distinction, calling the former cMOOCs and the latter xMOOCs (Watters, 2012), which has since been widely adopted. While cMOOCs are connectivist in nature and understand "open" as it has been defined in the open education field (OERs, OEPs), xMOOCs follow a more traditional approach to learning and see "open" mostly as a synonym for "free of charge" (although even this might change in the near future). As George Siemens (2012b) puts it:

> *Our MOOC model emphasizes creation, creativity, autonomy, and social networked learning. The Coursera model emphasizes a more traditional learning approach through video presentations and short quizzes and testing. Put another way, cMOOCs focus on knowledge creation and generation whereas xMOOCs focus on knowledge duplication.*

Lisa M. Lane (2012) proposes another interesting distinction aimed at accommodating other MOOCs, like ds106 – Digital Storytelling, that do not fit either "c" or "x" models – network-based (the cMOOCs), content-based (the xMOOCs) and task-based MOOCs (like ds106). Common to all types of MOOCs is that they are a developing field, with a lot of experimentation going on and many relevant questions to be answered (Watters, 2012). Completion rates are low in all of them (Jordan, 2013; Daniel, 2012; Hill, 2012; Holton, 2012;) and problems related with student satisfaction, learning support, technological environment and the quality of the learning experience are yet to be fully addressed (Daniel, 2012; Holton, 2012; Kop, Fournier & Mak, 2011; Siemens, 2010).

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UAb's Pedagogical Model for Open Courses: Principles of best practice

When setting out to devise a model for open courses, in particular MOOCs, at UAb, we build upon the aforementioned four main pillars of the university's pedagogical model: learner-centeredness, flexibility, interaction and digital inclusion. We want to combine autonomous and self-directed learning with a strong social dimension and that make learning experiences richer and more rewarding. We also want to articulate the flexibility that distance online learners need, especially those who are typical of our student population – adults with demanding professional and personal lives – with the pacing necessary to help them get things done and avoid the constant postponing of the learning activities in face of the always pressing everyday demands. We want to make learning available to as many people as possible, but also to bring these people into the digital online environment, where a crucial part of modern life happens, thus helping curb the digital divide.

At the same time, we look at the experiences that have been carried out by others in developing and deploying MOOCs. There are elements in all types of MOOCs that we deem interesting and useful, but none of them fit exactly our current pedagogical model or what we believe online learning should be like. Our model for MOOCs incorporates elements from existing MOOCs but adds other relevant aspects that derive from our experience with online learning and its integration in the larger context of UAb's pedagogical model, as well as the work that has been done regarding open educational resources and open educational practices. The most relevant principles are:

- Courses are open to everyone who wants to participate.
- Registration is required for publishing in the institutional spaces but all content is open access, i.e. anyone can read it.
- The two first weeks of the course are meant for participants to get acquainted with the spaces, tools and services, as well as with the processes of work and communication that will be used in the course. This "familiarization" process, already present in Universidade Aberta's Pedagogical Model as a standalone module that all students have to take when they start their learning at UAb, has proved to be an essential component in student success and satisfaction regarding their online learning experience.
- Resources provided as a starting point for the realization of the activities are licensed as Open Educational Resources or freely available on the Internet. Content produced by participants is licensed according to the individual preference of the authors.
- Learning is learner-centred and based on the realization of activities.
- Learning should be evidenced through the creation of artifacts (texts, videos, presentations, slide casts, mind maps, mash-ups, etc.) that demonstrate the learner's knowledge and competencies regarding the material studied. These artifacts are published online.
- The learning process combines autonomous self-study and reflection with interaction with other participants in an open social context. Participants are expected to take an

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active role in and be responsible for their own learning, but also to actively engage in helping build a supporting learning community.

- There should be a central place for the course – website of any kind (webpage, wiki, blog, etc.), LMS (Moodle, for example), etc. where all relevant information is provided (content, resources, schedule, instructions, etc.) – but most of the work and interaction should benefit from a networked learning perspective, whereby students use their own personal learning environments to manage their learning, publish their artifacts and engage in the conversation with other participants. Where it seems more adequate, an institutionally supported PLE may be used, i.e. a platform that emulates the experience of using a PLE by offering several web 2.0 tools and a social networked environment but in an integrated platform supported by the institution.
- Individual support or tutoring is impossible in a massive course. While there should be suggested activities and guidance from the course organizers, these can be carried out only at a more general level. Learning support has to rest in the learning community, through collaboration, dialogue, peer feedback and active engagement from participants in the learning process.
- A small team of collaborators can be used to support the implementation of the course – gather relevant information to be used to monitor and perfect the ongoing process, serve as community facilitators, monitor social or information networks for course related content, elaborate weekly summaries, etc. This may prove very helpful for the professor or professors leading the course to plan their intervention where necessary.
- Formative assessment can take the form of self-correction tests and also of peer feedback regarding the artifacts produced in the learning activities. Other strategies can be used to provide feedback of participants' activity – different recommender systems or badges for the completion of tasks or for relevant contributions to the community are two possible examples.
- Graded assessments are included for participants who want to receive a certificate of completion of the course. In this case, at least two of the artifacts produced as evidence of learning by participants will be assessed and graded through a peer-review system – those who wish to participate in the peer-review assessment will grade the artifacts produced by 3 other participants and have their artifact graded by three other participants. The final grade will be the average obtained in the 3 grades given. E-portfolios can also be used for grading purposes where they are considered adequate. The assessment follows the same peer-review procedure. Every assessment will be based on a detailed rubric provided by the professor or professors leading the course.

MOOCs in this pedagogical model, following the current terminology, can be labelled iMOOCs, with their focus on individual responsibility, interaction, interpersonal relationships, innovation and inclusion.

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A Pilot iMOOC on Climate Change: Design, results and analysis

The pilot iMOOC on Climate Change to be offered by UAb follows the principles stated above. Moodle (version 2.4) will be used to centralize the main information regarding contents, resources, suggested activities, schedule, etc. It will also harbour the discussion forums, one of the places where participants can interact and debate on relevant aspects of their learning process. Instead of relying on the participants' personal learning environments for the social, collaborative context, we chose to use Elgg, an open source social networking platform that has a great potential to be used as an institutionally supported PLE. It has a variety of web 2.0 tools and social networking functionalities, like rich profiles, micro blogging, blogs, social bookmarking, photo and video publishing, recommender system, wiki-like pages, etc., with the advantage of providing these tools and services in an integrated, user-friendly platform supported by the institution. There will be a single sign-on system implemented between Elgg and Moodle, and the two platforms will be further integrated by allowing students to access content in Moodle from within Elgg.

The course will run for a total of eight weeks, with the first one week dedicated to the familiarization process – a sort of boot camp to prepare participants for the technologies and processes to be used throughout the course. The remaining eight weeks are organized around topics, with a 5-minute introductory video to each topic. Resources are provided – mostly OERs produced in the framework of Lech-e[3], a European-funded project led by the Open University where UAb was a partner, coupled with other material that has either an open license or is freely available online – along with suggested activities to serve as a starting point for participants' own exploration, reflection and production.

Participants are expected to study independently, exploring the resources, searching and exploring other relevant material on their own, doing the activities and reflecting on their learning experience, producing artifacts that demonstrate their understanding of the topics and their competences in applying that knowledge. They are also expected to engage in the interaction with other participants and to take an active role in the dialogue around the topics being dealt with, contributing in relevant ways for the knowledge being created. They are responsible for their own learning and for contributing to a dynamic, supporting learning community as well. Formative assessment with self-correction will be made available, but participants are also encouraged and expected to discuss and give feedback to one another throughout the learning activities. Two of the artifacts produced by the participants will be peer-assessed and graded by three different peers, based on a rubric provided by the professors leading the course. This is mandatory only for those participants who wish to get a certificate of completion.

For a fee, participants can obtain formal credits for their work in the course. Those credits will be awarded following an evaluation by a professor or tutor comprising the two graded artifacts and an e-portfolio presented by the participants with the most relevant elements of their work in the course, combined with a final, face to face exam.

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A small team of volunteers will collaborate with the professors leading the course helping out with gathering information that may be relevant to better run the course and acting as "community animators" or "community helpers" whenever necessary or possible.

Conclusions and Implications: Towards a European approach on MOOCs?

Most of the response from European higher education institutions and politicians to the MOOC phenomena has been characterized as a need to react to the tremendous success of the top US universities. This is clearly a wrong choice. The success of the North-American MOOCs relates to their specific regional and national contexts. In the case of the US, we cannot forget how OER can be a most valuable tool for the consolidation of the community colleges higher education sub-system. In other regions, the growing demands for quality higher education calls for wide access to reliable and highly scalable distribution of learning materials.

What is the specific role of MOOCs in the European regional context or what can be their role in realizing the mission of European universities? The dramatic social implications of the current economic crisis clearly put a challenge to institutions and represent a major opportunity for massive open online forms of education in the old continent. But, do European institutions, or at least European open universities, share a common approach to MOOCs? Reality shows pedagogical models and traditions vary significantly across the continent. Although European open universities share some common values regarding how they value student support and the quality and integrity of the learning experience, there are also important different interpretations on how to implement them. Even so, there's clearly ground for cooperation in the continent by sharing resources and joining institutional initiatives, up scaling their impact.

UAb's pioneering initiative demonstrates this possibility, by developing a specific institutional approach, highly embedded in its own pedagogical and organizational culture, but also closely articulating it with a network of European partner institutions, namely open universities, thus aiming at a much larger audience.

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FIRST UNED-CSEV EXPERIENCES ON MOOCS DESIGN AND DISSEMINATION: BALANCE OF RESULTS

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Context

Education is moving towards global openness and accessibility (Wiley & Green, 2012) facilitated by new learning environments and tools based on technologies that have become key drivers in educational innovation (Harasim, 2012). This is the general setting where MOOCs (Massive Open Online Courses), the recent breakthrough in the field of education, are flourishing.

Even though the ideas behind it can be traced rather earlier, the term was coined in 2008 in the context of e-learning by Stephen Downes and George Siemens, when they were defining their course on Connectivism and Connective Knowledge – CCK08 (Siemens & Downes, 2008). Despite their short story, MOOCs are conceptualized as the evolution of networked learning and indeed it has become the educational buzzword of 2012 (Daniel, 2012), as some of the most prestigious US Universities have enthusiastically embraced and developed the concept. In fact, early examples prompted by the best American Universities, such as EdX (Harvard, MIT and Berkeley) and Coursera (Princeton, Stanford or Brown amongst others), have attracted hundreds of thousands of participants who contribute to both the materials and organization of the course.

The phenomenon, which has been likened by the president of Stanford University to "a digital tsunami" (Boxall, 2012), seems to sweep aside conventional university education. Whether or not the rise of MOOCs will prove to warrant such attention, there is no doubt that something very important is taking place in the educational system, raising profound issues regarding its main components, such as the role played by teacher/student, evaluation and certification, the distributive and interactive character of learning, its inclusive role given its open and free nature and so on.

In this context, both *UNED COMA* and *unX Entrepreneurship Community* are MOOC-based projects targeted at the Ibero-American world involving disruptive methodologies that are highly agile, scalable, flexible and aligned with the new digital environment. The objective of this presentation is to overview the main features and results so far achieved from these pioneering experiences, as well as to highlight some of the pending challenges and issues.

unX Entrepreneurship Community

UnX is the first Ibero-American Community for Digital Entrepreneurship aiming at piloting new methodological models to transmit knowledge on online environments. The concept making up the basis for the unX program is the *creation of an online Learning and Entrepreneurship Community where every member can learn, contribute and enrich it* progressively, adopting different roles in the educational process of open innovation.

Figure 1. unX Logo

In this sense, unX is based on the delivery of *massive Open Online Courses (MOOCs)* associated with *social and P2P learning*, where knowledge is acquired from the community and the individuals participating in the learning and evaluation process as "pairs". In this setting, exchanging ideas and experiences of the participants is key with tutors playing roles as accompanying guides.

UnX will also experiment with different models of *Open Educational Resources (OERs)* use and integration to explore all their potentialities. The contents of the *open courses* are presented *in the form of challenges*, so that students will participate in a more interactive and entertaining way as a motivation for learning, with badges acknowledging the achievement or overcoming of these challenges. *New online and certification systems* will be also developed and introduced. In this sense, unX will experiment with an *online badge-based accreditation* system and different evolution models towards a formal offline certification.

UnX also embraces a *social component* that should not be neglected. In fact, UnX will play a role in promoting educational inclusion as it enables the possibility to study from anywhere, interact with thousands of mates through the Internet, promote entrepreneurship and lifelong learning, share educational materials or access open educational resources created by different universities and this without visiting a classroom. The focus on Ibero-America adds a further ingredient in achieving this objective.

The unX Entrepreneurship Community is a *joint initiative* promoted by the National Distance Learning University (UNED), the Centre for Virtual Education (CSEV), Telefónica, Banco Santander and the Massachusetts Institute of Technology (MIT). In any case, due to the open nature of the unX Entrepreneurship Community, the door is open for organizations to participate in various ways: sponsoring challenges, providing funding, projects, technological platforms, contents for new MOOCs.

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Even though a wide portfolio of MOOCs is to be released in short, the starting point has been the elaboration of the three courses. The first pilot course is focused on the necessary skills to *develop Android mobile applications and entrepreneurship competences in the new digital context*. The motivation is to prove that learning entrepreneurship competences can be easier in the digital world, in a way that open participation technologies and methodologies will be used to facilitate the acquisition of the skills needed in the digital world.

The main objective of the second course, "*Transversal Competences for Entrepreneurs*"**,** is to provide a set of knowledge to implement a business idea, covering all the fundamental skills, which are basic for the design of a holistic entrepreneur strategy. Finally, the third course ("*unX MOOC in Basic Digital Competences within Virtual Education Environments*") is aligned with the Ibervirtual Project[1] and aimed at ensuring basic capabilities to manage information online, assess the different sources of information available, collaborate, communicate, create self-designed content and take advantage of technology in order to solve and ease real life challenges.

Two months and a half after unX started, more than *7,000 students* have joined the initiative attracted by a *learning model based on collaboration*, free use of educational resources and innovative technologies where those interested in entrepreneurship can learn in a flexible and share knowledge, experiences and opportunities (see Table 1 for further details).

UNED COMA

Last October, the National Distance Learning University (UNED), following its steady innovation path, launched *UNED Abierta*. UNED Abierta offers free and easy access to thousands of materials generated by the UNED since its inception that were until then dispersed: videos, TV and radio programs, historical materials, OCW, iTunes U, etc.

Figure 2. UNED COMA Logo

The great innovation in this platform, resulting from the joint efforts of the UNED, CSEV and organizations like Telefónica Learning Services (TLS) and Universia-Santander, is also the delivery of Massive Online Open Courses (MOOCs).

Participants in UNED COMA have access to training materials in the form of short videos recorded by trainers, learning challenges, self-assessment activities to check progress, and an interactive environment with a forum where they can ask questions. Other participants with the supervision of a curator normally answer questions. "*Badges*" are also automatically

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granted to participants, recognizing their progress and contributions to the learning community.

One of the landmarks of UNED COMA is related to the flexible *on-line/off-line evaluation system to accredit skills* acquired by participants in MOOCs. In fact, UNED COMA is determined to implement a *more flexible and modular system of accreditation*, thus transcending the borders of digital certification and fully aligned to the current needs of competences recognition required by the Digital Economy.

As such, in addition to "badges", two other different types of accreditation are available, namely:

- **Credential**: validation of having successfully finished the course and having passed an on-line test.
- **UNED COMA certificate**: in collaboration with UNED (prior to formal test in an UNED associate centre).

The ultimate aim of this model of certification is to offer a brand-new model of training and certification able to draw the attention of students and potential employers, as well as to become an entrance door to join formal education.

According to data as of first week of February, there are nearly 49,000 unique registrations in the 21 courses already available in the platform. So far, only 140 UNED COMA certificates have been launched, as certification has only been available as a pilot program. The figures will be substantially larger in the incoming weeks as certification is being thoroughly available in all courses (see table 1 for further details).

Table 1: UNED COMA and unX: Basic results (4/2/2013)

	UNED COMA	**unX**
Unique registrations (number)	48,753	7,000
Course registration (number)	58,955	3,991
Number of courses in platform	21	3
Number of UNED courses or participated by UNED	21	3
Staff implied in course uploading	3	2
Curators (1 per course)	21	3
Number of facilitators		1
Number of certificates delivered	140	0

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Challenges Ahead

UNED COMA and Unx are both projects based on the implementation of innovative solutions in terms of technology, methodology and contents used and promoted. Needless to say that even though results achieved so far are striking, quite remarkable challenges still lie ahead. UNEDCOMA/UnX innovation roadmap is focused on research and development on some key areas:

- Advance learning analytics modules for these massive online learning communities.
- Trustworthy online certification and other blended certification models.
- Innovative self-assessment materials, especially those involving intensive use of mobile technologies.
- Disruptive learning methodologies based on social and collaborative dynamics and karma system.
- Definition and adoption of an ad-hoc licence for MOOC contents.
- Federation of different MOOCs platforms and course repositories.

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[1] Ibervirtual is a program aimed at strengthening and promoting inclusive education by strengthening distance education in the Ibero-American Knowledge. The program was as created in 2010, in the XX Ibero-American Summit of Heads of State and Government, held in Mar del Plata, Argentina.

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OPEN DISCOVERY SPACE

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Abstract

Through the creative use of new technologies, effective content organization, and learning processes that respect local school problems, **Open Discovery Space** tries to address the challenge of the "social appropriation of knowledge" by empowering all school audiences, but mainly teachers, pupils and parents. The approach to be followed contributes to the development of self-esteem, an increased "sense of belonging", and an improved perception of one's own capacity to solve problems and contribute to the "construction of the surrounding community". These factors have been clearly related to the development of "social capital" and a greater degree of conviviality and peace. The school component and the community dimension of the project place an emphasis on developing certain key values and attitudes that play an important role in this process, such as the capacity of team work and a spirit of collaboration as a way of developing learning networks and communities. Consequently **Open Discovery Space** is promoting Open Education as key approach to opening up contents, learning and collaboration. The main outcome of this process will be the **Open Discovery Space** portal: a community-oriented social platform where teachers, pupils and parents will be able to discover, acquire, discuss and adapt eLearning resources on their topics of interest.

Introduction

There are currently numerous education reform initiatives in Europe as policy makers try to make schools more effective and provide students an education that prepares them for life in the 21st century. Schools are being asked to increase the quality of education, notably by providing more students than in the past with advanced skills and the ability to be flexible thinkers and problem solvers. These reform initiatives vary and include: programmes to develop educational repositories with certified content; professional development opportunities to in-service teachers, networked laptop computers for all students, classrooms with interactive whiteboards to help make lessons come alive; wireless Internet access points

in schools; large scale ambitious plans to remodel schools and create learning environments which inspire all young people to unlock their hidden talents and reach their full potential; 21st century work places for teachers; and provide access to facilities which can be used by all members of the local community.

All these efforts clearly serve – at different levels – the vision of *Re – Schooling*, towards schools as "Focused Learning Organisations" and "Core Social Centres", that is dynamic establishments in strong cultures of equity and consensus about their value, which follow system-wide, root-and-branch reform. This vision was elaborated back in 2004 by the International Schooling for Tomorrow Forum (OECD, 2004). At the core of these reforms is an emphasis on 21st century teaching and learning in which eLearning and digital resources is not merely present, but is used in the most effective ways possible. In the OECD scenarios, schools are revitalised around a strong "knowledge" agenda, with far-reaching implications for the organisation of individual institutions and for the system as a whole. In the process of Re-Schooling (OECD, 2006), eLearning and Open Educational Resources (OER) are fundamental support tools to allow educational establishments to comply with their central social function. UNESCO (2002) has defined Open Educational Resources (OERs) as the "*technology – enabled, open provision of educational resources for consultation, use and adaptation by a community of users for non – commercial purposes*". The Open Educational Resources movement is a technology-empowered initiative that aims to create and share educational resources that are freely available online for everyone at a global level (Larson & Murray, 2008). The main objective of such initiatives is to extend the reach of education and expand learning opportunities (D'Antoni & Savage, 2009). Open sharing of resources and collaboration offer real potential for enhancing both teaching and learning. And by promoting and facilitating the adaptation and translation of resources, it upholds education that is meaningful and relevant to an individual's environment and needs. By keeping the required integration and balance between learning innovation and well-proven educational approaches and designs, Open Discovery Space promotes and realizes the concept of Open Education for opening up contents, learning and collaboration in the school sector to strengthen the learning of the pupils, the future citizens and finally the whole European society across all European countries and regions (Stracke, 2012).

Constraints on the use and re-use of eLearning resources

eLearning resources were initially conceived as a tool to make distance education efficient, by easing teacher's re-use of self contained chunks of educational material (referred to from now on as teaching & learning resources/objects) for course construction and synthesis (Polsani, 2003). They were subsequently recognised to have the potential to be helpful for education in general, since into learning resources repositories teachers may find innovative proposals to improve their educational practice (such as materials to carry out problem-based activities), as well as simple technological tools (such as Java applets for simulating complex scientific phenomena) whose implementation might be beyond their competence (Wiley, 2010; Allen and Mugisa, 2010, Nash, 2005). However the diffusion of digital learning resources has been

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slowed down as a sequence of the fact that digital systems (i.e., computers, mobile and wireless devices, smartboards, etc.), despite having been introduced into schools from the eighties, are not yet deeply integrated into school day-to-day activities (Hadjithoma & Karagiorgi, 2009). Moreover, research has highlighted a number of difficulties that still hinder teachers' appreciation and actual use of digital learning resources in school, such as the scarce information on the resources quality and the limited congruence of the metadata standards with the current indications of the learning theories (Bratina, et al. 2002; Schibeci, et al. 2008). There is also a problem of context: an educational resource suitable for teaching in UK schools may be unsuitable for supporting the teaching of the National Curriculum in a school in Greece. More specifically, existing learning object repositories (LORs) are lacking systematic mechanisms for relating their educational resources to their learning context of use (Duval & Hodgins, 2003; Conole, 2008; Azevedo, et al., 2007). As a result, neither the provision of consistent learning contextual information (through metadata descriptions) nor the use of this information to support the search/retrieval of digital educational resources are supported in existing LORs, even though these features can enhance the searchability and the reusability of the learning objects that are stored in LORs. Recent approaches to eLearning have largely focussed around the reuse of resources to develop economies of scale and thus partially address the low usage of ICT. As Redmond and Mander (2009) pointed out, one problem in focusing on educational resource reuse is that teachers tend to plan their ICT based activities around 'instructivist' learning models, which focus on single learners accessing content. Thus, it does not help bridge the gap between modern pedagogical theory and implementation. Recent developments in technology allow us to go beyond resource reuse and support implementation of recent pedagogy, in particular social-constructivist learning processes (Wills & McDougall, in press). Interoperable, networked technologies have the potential to support students' collaborative activities, allowing them to source, create, adapt, integrate and store resources in a variety of formats. These new possibilities and affordances of eLearning tools mean that it is becoming easier to use technology to support social-constructivist methods of learning, such as collaborative learning through learning communities (Ram, et al. 2011). These learning methods focus on the process of learning and on the learning activities students carry out in order to gain knowledge of concepts. There are a number of factors constraining the development of reusable learning activities and based on sharable teaching resources:

1. Teachers frequently do not have the skills to develop activities based on a range of educational models. This results in a gap between application of pedagogy and the effective use of tools and resources. Often teachers and learners view technology in terms of how it will help them manage resources rather than supporting learning (UNESCO, 2009).
2. Any inability to engage with educational taxonomies through unfamiliarity with the relevant metadata and vocabularies makes it very difficult for teachers to search for generic learning activities from various subject disciplines (Conole, 2008). Teachers would probably have to browse through resources and activities, accessing and viewing each one of them in order to understand their potential for supporting effective

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learning. While browsing could be an effective strategy for a single collection of a small number of activities, it would be difficult for wider searching.

3. eLearning practice is moving towards the reuse of generative resources (e.g. resources developed by learners themselves during learning tasks). This means that the *outputs* from learning activities should also be considered for reuse. However, most teachers do not have the required e-literacy skills (for example to archive outcomes of activities) to allow for effective reuse of learning resources and activities outcomes (Cameron & Campbell, 2010).
4. Any focus on the development of "definitive resources" can lead to the production of inflexible materials that do not cater for individual learning contexts. There is a need for tools that allow the teacher to customise generic components to provide a tailored learning experience (Oliver, et al. 2010). However, there are currently few tools available to allow teachers to support learning activity sharing and sequencing (Paquette, et al. 2008).
5. Although efforts for collecting teaching & learning resources in learning repositories have long been deployed (with a number of LORs in Local, European and International level) school teachers have yet to prove their competence in taking advantage of their full potential (Caswell, et al. 2008).

Overall, schools and classrooms, both real and virtual, must have teachers who are equipped with learning and technology resources and skills and who can effectively teach the necessary subject matter content while incorporating technology concepts and skills. Interactive computer simulations, digital and open educational resources, and sophisticated data-gathering and analysis tools are only a few of the resources that enable teachers to provide previously unimaginable opportunities for conceptual understanding. Traditional educational practices no longer provide prospective teachers with all the necessary skills for teaching students to survive economically in today's workplace.

The main questions to be answered are:

- How can we measure and assess the impact of using eLearning resources in schools both in terms of learning outcome and learning activities?
- How can we motivate teachers, students and parents to use eLearning resources actively and exchange their experience and views on usability and quality of those resources?
- How can we contribute to bridging the language and culture gap and mitigate technical obstacles in eLearning with a view to removing barriers that hinder adoption?
- How should search engines be improved in order to deliver relevant Learning Resources to teachers, students and parents more effectively (e.g. by allowing to express and take into consideration desired learning outcomes)?

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The Open Discovery Space contribution

For the first time in history, technological tools and solutions exist that can make vastly improved learning systems routinely available. But this goal can only be achieved if we are willing make research taken up in real educational environments. The field has been marred by false promises and gross underestimates of the complexity of the task. This is undoubtedly one of the most difficult, and most important, global research challenges today. To fulfil its promise for education will require a great deal of high-quality research, focused on its utilization and impact on both school and non-school settings. Only by collecting and analyzing data on student learning can we hope to short out the many variables that determine effectiveness. The same type of research is also needed to explore analyze, and improve each of the many other components of educational systems. For example, the most important element of any educational system is a highly skilled teacher. Teacher recruitment, preparation, retention, and professional development all need to be informed by research in education. Curricula, pedagogy, assessment, and school system management similarly require focused research. In the following paragraphs the three main areas of contribution of the Open Discovery Space project (supporting and improving educational practices through the use of eLearning resources, developing communities of implementation and delivering a socially powered multilingual portal to facilitate the modernization of the school pedagogy) are presented in detail.

Optimise the use of eLearning resources

The Open Discovery Space consortium recognizes that the fundamental barriers to employing eLearning applications and resources effectively for teaching and learning are not technical or financial, but psychological, organizational and cultural. Powerful methods for scaling-up and transferring pilot implementations and for evolving the public's conceptions of learning and schooling are essential to take full advantage of the opportunities new technologies pose. The project is attempting to add its contribution to these ambitious goals and visions, by designing and developing a socially-empowered portal that will highlight significant opportunities and challenges for innovation enabling a more effective exploitation of the rich but disperse educational content available in the digital repositories across Europe. The work will focus on the exploitation of the learning context characteristics that educational resources are using and will propose methods for classifying and relating digital educational resources with the learning context of use. The proposed scheme enables practitioners to understand and prioritize the challenges involved in the implementation of eLearning, design school-based change initiatives, and facilitates constructive dialogues and consensus building in the school community. From a content and pedagogical perspective, the Open Discovery Space learning environment will provide teachers with an access point to select resources (e.g., lesson materials, teaching plans) to support innovative forms of eLearning. The Open Discovery Space Educational Design will be based on the main components of Resource Based Learning: enabling contexts, resources, tools, and scaffolds. Taken together these components enable teachers to create and implement learning environments of considerable diversity and flexibility. The proposed methodology aims to optimise the use of learning content by linking

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supply-side (digital content and applications) with the demand-side (teachers, students and parents).

Developing a network of communities of implementation

Although most of the European educational systems remain highly centralized, ICT policy implementation remains optional and allows for substantial discretion to the implementers, and for a "backward approach" leading to goal and role definitions in the field. In the light of such open-ended and general ICT policies practitioners at the micro level and the communities of implementation they generate as a response to ICT policy can be proved critical in ICT integration into the system. The propose project aims to enhance the role of such communities. An important concept underlying the proposed approach is the notion of the community of implementation, which is regarded as a type of community of practice. Within the project in particular, communities of implementation will be regarded as self-reproducing, and evolving entities emerging within the school settings as a response to an externally developed policy. Various authors emphasize the importance of communities of practice for organizations (Lesser & Storck, 2001; Wenger, et al., 2002) and therefore communities of implementation are considered as a purposeful strategy for spreading innovations. The project consortium will promote local awareness raising and appropriate content development and use. The development and the establishment of a decentralized network of nodes will build upon and extend the work of the community of practice. And perhaps, more importantly, nodes will operate in the local language and culture to stimulate and enable development and use of eLearning resources as befits local need. Although nodes maybe act largely independently, those active in the node will have experiences and resources to share with the Open Discovery Space community, which will remain active as a platform for on going interaction at the international level.

Set up and roll out a socially-powered, multilingual portal

To support the optimisation of the eLearning resources and the development of strong and self-sustained communities of implementation the project aims to deliver a European-wide, socially-powered, multilingual Web portal that will allow teachers, students and parents to intuitively discovery, acquire, share, discuss, reuse and revise digital educational resources that are available through a virtual pan-European infrastructure. To achieve this, it will aggregate and make available a critical mass of content that has been produced by the majority of the *e*Content*plus* initiatives that have been developing repositories/collections of educational content, aligning relevant standards and architectures, and bringing together interested stakeholders. The Open Discovery Space portal will act as a laboratory of ideas, a clearinghouse, a standard setter, a capacity builder for the community and a catalyst for international cooperation between the distributed user communities. The portal will include components that will allow communities of implementation to easily set up and deploy their own lightweight portal versions (termed as *MyDiscoverySpace*) that will be fit to their community needs (e.g. thematic or linguistic). The *MyDiscoverySpace* sites could popularize and promote the effective use of digital resources, introduce freely available technologies and

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software, and share good practice, as well as practical information on how to set up new eLearning initiatives and how to attract more users. The opportunity offered by such an approach, to test the infrastructure and the methods in the local setting, could promote acceptance of the proposed approach by even the most traditional institutions and could help to break down barriers to knowledge sharing, promoting a truly democratic sense of access and ownership.

Current status and future steps

The consortium, by building on the extended expertise of its members in the field, has implemented a foresight process to map and through consecutive cycles of reflection proposes effective methods that will support **the modernization of school education, the development of teachers' digital competencies and that will stimulate demand**. The project team reviews scientific evidence from Europe and beyond and educational stakeholders' views and aspirations to identify and analyse the emerging trends, opportunities and challenges in school education and eLearning, that will act as the most significant drivers of the modernization of the school pedagogy in the mid-term future. The project team will provide the widest and most inclusive understanding and framework for the subsequent stage of experimental fieldwork. The aim of the Open Discovery Space project is to help teachers acquire and reinforce such skills and knowledge so that they make best use of the new opportunities offered by the digital content that it is available on the web. Additionally the project aims to train the ICT support staff of the schools to effectively support the work of the teachers and the students through the creation and maintenance of local educational repositories (*MyDiscoverySpace*). The project aims to achieve that through the development, testing and implementation of a series of participatory engagements activities that will improve the uptake, sharing and reuse of digital learning resources in schools. In general, the project aims to improve teachers' practice in all areas of their work, combining ICT skills with innovations in pedagogy, curriculum, and school organization. It is also aimed at teachers' use of ICT skills and resources to improve their teaching, to collaborate with colleagues, and perhaps ultimately to become innovation leaders in their institutions. In addition, train technically competent school staff (such as ICT personnel or teachers of Informatics) about the ways they can select some of the existing, easy-to-use, and free-of-cost software tools that various organisations around Europe offer, in order set up their own learning repository (on a school or regional level) and to interconnect it with existing infrastructures. The overall objective of the project is not only to improve classroom practice, but also to both raise the awareness of school staff across Europe on the need for accurate tagging of resources and to provide a user-friendly approach that motivates teachers to quickly and easily add metadata to resources that they have both used and created.

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THE NORDIC ALLIANCE FOR OPEN EDUCATION – STATE OF THE ART, CHALLENGES AND OPPORTUNITIES

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Introduction

Are the Nordic countries forerunners in Open Education? What is the state of the art, barriers and opportunities of Open Education in the Nordic countries? What are necessary actions on policy, institutional and individual levels? These are the main questions of this paper.

Open Educational Resources are discussed widely on a global, European and even Nordic level. UNESCO, which has coined the term Open Educational Resources (OER) some 10 years ago, published in June 2012 a global agenda for OER, the Paris Declaration (adopted by OER World Congress). The Declaration shows the importance of Open Educational Resources and gives recommendations to governments and institutions around the globe. The European Union has started a large-scale initiative on "Opening Up Education" (http://ec.europa.eu/dgs/education_culture/documents/consult/open_en.pdf).

The concept of OER seems promising, potentially leading to educational collaborations, having potential for stimulating innovation in education, reducing cost of education, and broadening access to education for all. However, the awareness on the opportunities of using OERs is still low in the Nordic countries. In contrast to Open Access (for publications) or Open Source (for software development), OER are not yet broadly known and accepted / adopted. It is highly necessary to combine the initiatives and ideas of *open* approaches. This is the case at a user level as well as on policy level (see also Clements & Pawlowski, 2012). Therefore, it is important to promote OER to governments at all levels as well as to institutions.

The Nordic countries seem to be a good ground for openness and sharing: the Nordic countries share many values related to education and technology development; the political

and governmental institutions are quite similar – there is also a tradition for exchange of knowledge and solutions between the countries.

In this paper, we briefly give an introduction to OER and reflect on the state if the art of Open Education in the Nordic countries. In expert workshops by the **Nordic Open Education Alliance**, barriers and possible interventions to overcome them were explored. Based on these, we formulate recommendations as well as propose implementation actions. This study is based on a position paper from the Nordic Open Education Alliance (http://www.nordlet.org/?=position).

Background: Open Educational Resources (OER)

In the following, we will give a brief introduction to the concept of OER and current issues regarding global adoption (based on Pirkkalainen & Pawlowski, 2010). The UNESCO 2012 Paris OER Declaration designate OER as "teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions. Open licensing is built within the existing framework of intellectual property rights as defined by relevant international conventions and respects the authorship of the work". We define OER as "*Any digital resource which can be freely accessed and used for educational purposes*". This broad definition includes a lot of different objects, such as digital learning resources, software tools like wikis or authoring systems, simulations or animations, electronic textbooks, but also lesson plans or records of shared experiences. The main aspect is that the resource is usable to improve education. We see that OER shows parallels to and includes other "openness initiatives":

- **Learning resources**: Currently, the main research field is how to make resources specifically created for learning purposes available and reusable. This includes multimedia documents and simulations, but also simple web resources in HTML or XML format.
- **Articles, textbooks and digital equivalents**: These resources contain typical objects provided by libraries, such as articles, conference papers, books or journals. When becoming freely available, these resources are connected to the concept of Open Access (Björk, 2004; Bailey, 2005).
- **Software tools**: These tools are usually referenced as Open Source or Free Software (Raymond, 1999). Software tools are used for different purposes, such as producing / authoring learning resources, but also for communication and collaboration.
- **Instructional / didactical designs and experiences**: Educators are highly dependent on successfully planning and designing their learning experiences – these resources includes access to instructional designs, didactical plans (lesson plans), case studies or curricula. It also includes one of the most valuable resources: sharing experiences about materials and lessons among colleagues. These resources are also called Open Educational Practices.

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- **Web assets**: These are simple resources (assets) like pictures, links, or short texts, which are not usable on their own in a learning context but can be used to support or illustrate certain topics. In many ways, these are resources found by Google or similar search engines.

Summarizing the definition, we see *core OER* as freely accessible, reusable and modifiable / adaptable resources, in a broader sense, also related resources (documents, publications, tools) should be considered as *broad OER*.

OER in the Nordic Countries

In the following, we give some examples and links to successful initiatives in the Nordic countries. The list does not intend to be complete, however, it will be extended by the network. Not all initiatives or links are OER only. Also initiatives and sites related to OER or close to OER are listed. The list has been developed in collaboration with the POERUP project (http://poerup.referata.com) which has made significant efforts to map OER across Europe.

Denmark

- EMU is a public portal for educational content in Denmark by UNI·C (http://www.emu.dk).
- Materialeplatformen is a national repository for all Danish learning resources (http://materialeplatform.emu.dk/materialer/index.jsp).
- The Danish Public Broadcasting (DR) provides a portal for academic lectures (http://www.dr.dk/DR2/Danskernes+akademi/).
- Duda.dk (http://www.duda.dk) is a comprehensive site with links to educational resources for school children, parents and teachers.

Faroe Islands

- Snar.fo (http://snar.fo) is the public portal for educational content in the Faroe Islands. It is maintained by Nám, which provides the educational sector with material, courses and IT support.

Finland

- EDU.fi (http://www.edu.fi) is set up and maintained by the Finnish National Board of Education (FNBE), a national agency under the Ministry of Education and Culture. FNBE has a wide range of tasks related to the development of education all through pre-primary and basic education, general and vocational upper secondary education and training, adult education and basic education in the arts. Swedish resources are also available (http://edu.fi/hitta_material/digitala_larresurser).
- Vetamix.net (http://vetamix.net) is a collection of learning resources.
- Länkhåven provides selected and qualified learning resources in Swedish and Finnish (http://lankhaven.edu.fi/oph/search.html?lang=sv).
- FIN Instructions for teachers, teacher cards (http://www.peda.net/openkortti).

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- Small Highschools in Finland (http://www.peda.net/veraja/pienetlukiot).
- LeMill (http://lemill.net) is a collaboration between Finland and Estonia.

Norway

- NDLA (http://ndla.no) is a cooperation between 18 counties to provide learning materials using open licensing models for the learning resources and the technical infrastructure. In Norway the counties are responsible for providing learning resources to the students of secondary schools free of charge.
- NRK, the Norwegian state broadcasting company (http://nrk.no/skole/), provides OER services developed with public funding.
- delogbruk.no (http://delogbruk.no) is a Norwegian Web 2.0 initiative which stimulates educators at all levels to share learning resources and experiences.
- utdanning.no (http://utdanning.no) is the official Norwegian national education and career portal, and includes an overview of education in Norway and more than 500 career descriptions.
- ovttas.no (http://www.ovttas.no) is a collection of pedagogical articles, pictures, books, videos, and audio recourses for Sami schools.

Sweden

- Länkskafferiet is a Swedish Link Library for educational use. It is meant to be a pedagogical aid for Swedish pupils from 5 to 18 years of age (http://www.lankskafferiet.org).
- The National Agency for Education (Skolverket) is the central administrative authority for the public school system and provides resources through a page with links and information about digital learning resources (http://www.skolverket.se/skolutveckling/itiskolan/digitala-larresurser).
- The project OER – Open opportunities for learning involves nine universities with Karlstad University as project coordinator in collaboration with Lund University (http://oersverige.se).
- UR access (http://www.uraccess.se) is a collaborative service from more than 25 educational institutions. It provides access to all streamed material, radio- and TV-programs provided by Utbildningsradion (UR).
- Spindeln is a search engine for open educational resources for schools (http://www.skolverket.se/skolutveckling/itiskolan/digitala-larresurser/om-spindeln).
- Libguides is a portal for resources on OER, and also with links of different kinds on OER, especially for higher education institutions (http://libguides.lub.lu.se/oer).
- DELA! (Share!) is a community (Ning) for education and learning (http://shareanduse.ning.com).

It can be observed, however, that a lot of regional / institutional initiatives exist but are not linked to national initiatives and thus are not networked appropriately. There is at present a lack of national strategies and policies in how to best exploit the potential of OER in the national education system as a whole and a similar lack of coordinated Nordic initiatives.

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Furthermore, there are very few collaborations across the Nordic borders. As a conclusion, OER has received considerable attention but has not been exploited fully yet in the Nordic countries.

Open Education: Barriers in the Nordic Countries

Opening up education seems promising from educational, economical and development perspectives – however, there are currently still many barriers keeping stakeholders (educators, administrators, management, learners, etc.) away from broad OER adoption. We have identified some of the main **barriers** of OER in the Nordic countries. As a second step, we discuss **opportunities and key questions** of Open Education / OER. What is the possible impact for OER on a national, regional (Nordic) and global level?

The barriers have been derived based on a literature review and two expert workshops with stakeholders and experts from all Nordic countries. For each aspect, experts identified barriers as obstacles towards OER take-up. Based on this, the possible impact and necessary actions were discussed and documented.

The barriers identified are rather similar to barriers found in different domains across Europe (see for example Pawlowski & Clements, 2012). We see that there are barriers on all levels: On a policy level, there are no policies in place to promote and support OER in the Nordic countries. The same is the case on the institutional level – there are almost no policies which is a strong contrast to for example Open Access which is widely accepted and promoted by educational institutions. On an individual level, we have explored that still awareness building is necessary. Furthermore, it is essential to overcome fears, for example regarding IPR and licensing. Also, recognition and motivational issues play a major role.

As a conclusion, we can state that the above presented barriers provide a clear picture of the Nordic situation on OER. We see still a lot of obstacles but also potentials and promising possibilities to overcome the barriers. The barriers and possible actions can be used as a basis for future action planning on a policy, institutional and individual level. We can strongly recommend future collaboration to utilize the potentials in the Nordic countries. Furthermore, the great basis of available resources and pedagogical approaches can be a strong base to strengthen the Nordic position on the global educational market by establishing and exploiting international collaborations.

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Table 1:

Aspect	**Barriers**	**Opportunities / Impact**	**Actions**
Strategies and Policies: Specific OER Strategies	Lack of Nordic policies on OER Lack of national policies	Provide political guidance, support and engagement	Build a Nordic position on OER Create national OER policies
Enabling environments: Connectivity, mobility, literacy, standards	Lack of interoperability Lack of easy-to-use systems	Creating access to a variety of OER through national / regional portals and communities Utilize OER across platforms and systems	Create flexible portals and collaboration environments Support the development and use of (international) standards
Use and Awareness: Inclusion, access & equality	Lack of awareness and attitudes on policy and user level Lack of support by middle management in institutions	Allow collaborations within and across the Nordic countries as well as internationally	Create Nordic communities Connect to international communities Create and support university policy development
Open Licensing Frameworks (understanding, public funding)	Lack of knowledge on open licenses (e.g. Creative Commons)	Make simple licensing mechanisms, understandable to educators and others	Support and enforce use of open licenses
Sustainable Development and Quality: Supporting teachers, quality, peer review	Lack of uptake by teachers insecurities on quality lack of quality mechanisms	Creating collaborations and shared teaching Increase quality	Provide collaboration support and incentives Create user-based quality mechanisms
Strategic Alliances: across borders, Public Private Partnerships (PPP)	Lack of policy instruments lack of partnerships	Increased international collaboration Supporting educational global collaborations	Provide programs for international shared teaching Support PPP and business model creation
Development / adaptation for culture / language: adaptation, accessibility	Lack of long-term collaborations Lack of accessibility Lack of tool to collaborate across borders	Allowing diversity and support of languages and culture Create access for special needs	Provide accessibility and adaptation guidance
Research: development, efficiency, quality	Lack of research on OER, in particular business models, acceptance, sector-specific uptake and effects	Increase research for OER and related topics, in particular applied research	Create specific OER research programs
Finding / retrieving: Services and tools, interoperability	Lack of knowledge on available tools	Create easy opportunities to find, adapt and embed OER	Use good practices and validated tools from international projects and collaborators
Change / adoption processes	Lack of balanced approaches (bottom up and top down)	Create good practices of both, bottom up (eg initiated by students) and top down (eg providing institutional strategies)	Collect and synthesize mixed approaches to adoption and change

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Consequences for the Nordic Countries

We have identified key barriers and possible actions to promote and exploit Open Education. Open Education is an issue which can reform education in the Nordic countries and across the globe – however, it needs strong actions on a policy, research and implementation level. The following recommendations are an initial set which aims at creating discourse in the educational community. They were created based on the Nordic situation but can also serve as a starting point for OER discourse in any region.

Policy recommendations

1. Create a Nordic ministry collaboration on OER, consider making OER a priority for the Nordic Council of Ministers.
2. Provide a position and input to international policy discourse (UNESCO, EU).
3. Create national OER policies for different domains.
4. Support research in critical areas, create a clear research agenda on OER.
5. Support collaboration across borders with selected regions and countries.
6. Consider open licenses for materials developed with public funding.

Institutional recommendations

1. Consider OER as a part of the institutional strategy and engage in OER activities by providing institutional policies and guidance.
2. Provide recognition to educators using and developing OER.
3. Encourage collaborative teaching and learning using OER.
4. Engage in Nordic OER collaborations, consider participating in international OER collaboration.
5. Provide awareness and training on OER, licensing and tools.
6. Utilize partnerships for international exploitation / collaboration.

Technology and implementation recommendations

1. Create collaborations and international communities for OER.
2. Create access channels to portals, repositories, tools and communities on OER.
3. Utilize international standards.
4. Create solutions that are accessible for all.
5. Provide quality mechanisms.
6. Create and share guidance, good practices and experiences.

These recommendations derived from the barriers should serve as a starting point for discussion. However, they also define issues for future (collaborative) research on open education and its adoption process.

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Summary

The current OER initiatives such as the Paris OER Declaration can be a big step forward towards access to education. However, it is necessary that governments engage and commit to integration of certain OER recommendations into national and regional policies.

By empirically identifying barriers and possible actions, our study is a starting point for supporting OER adoption on different levels. The action items can be used by stakeholders to determine necessary implementation steps and create action plans. As this process gathers momentum, the OER movement has the potential to create great synergies for access, collaborations and quality of learning, education and training. However, those possible benefits need to be systematically explored, planned and validated.

The Nordic Open Education Alliance aims at contributing towards collaborative research, discourse and policy support. This community encourages the further discussion of this study and in particular recommendations.

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LIMITS OF JOY

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Introduction

Conference names need to be read against the grain. If there is talk about quality we should be on the alert, that quality is a problem; if the theme is joy of learning it rather indicates that there is a problem with joy. Hence the question implied in the conference title to the participants can be read as: how to leverage the learner from a 'low-joy-equilibrium' to a 'high-joy-equilibrium'?

Educators tend to answer this question by discussing various instructional approaches which is perfectly legitimate and, indeed, necessary. However, this paper uses a different approach. It will focus on the external parameters limiting the legroom for joy.

The disutilities of labor & learning

Our present system of education was conceived in the nineteenth century and had much in common with the factory (and the military). It has been seen as a means to manage the process of urbanization and much of its purpose was, even more than inculcating the basic skills of the 'three Rs', the formation of the appropriate morals and secondary virtues such as punctuality, docility, sobriety. It was certainly not invented for joy. (Dreßen, 1982; Green, 1990)

The education system is seen as serving the economic system: 'The school serves the factory'. The factory, however, is a place of labour. Labour is a 'disutility': It is one of the basic building blocks of *neoclassical economics* that individuals have to make choices between *labour and leisure*; labour is the disutility and leisure the utility; we can only be persuaded to work (i.e. forgo leisure) by the income derived from work, which alone allows our full participation in the leisure opportunities of the consumer society.

Schools emerged together with factories as means to manage the process of urbanization. Thus, being subservient to the labour market, it is little wonder that the disutility character of labour translates back into a perception of learning as disutility. In fact, following the lead of neoclassical economics, learning is a disutility in a double sense: While forgoing leisure for the disutility of labour the pay-check gives rather immediate compensation allowing, in turn, instant participating in the leisure activities consumer culture offers. The learner, on the other side, is not only faced with giving up leisure for labour but at the same time has to choose

future rather than *present consumption*. While the present costs of learning (e.g. time, fees, effort) are certain, the future benefits come with a risk. Hence it is not that easy to even make *extrinsic* motivation work. *Human Capital Theory* has therefore elaborated a complex argument demonstrating the positive 'rates of return to educational investment'[1]. Admittedly extrinsic motivation (such as a higher pay check) brings some joy but a joy of a different kind, not a joy of learning which is here identified with intrinsic motivation. This leads for both, the realm of work and of study, to the same conundrum: how to create intrinsic motivation for externally-set purposes?

While education always had to serve the labour market, it still remained rather impervious to market forces. Since the eighties, however, attempts were made to subsume education more broadly under the efficiency logic of the market.

The learning bubble

To demonstrate how the same logic operates in the economy at large and in the realm of learning, we construct in the following an analogy between the 'sub-prime mortgage bubble' (leading to the 2007/8 crisis) and the building up of the 'student debt bubble'. (Having to watch a mounting debt-burden certainly limits the joy one might otherwise get from studying.)

In the 1970s a prolonged historical period of about 150 years of rising real wages, laying the economic foundation of the 'American Dream' (Figure 1), came to a rather sudden end in the US. The continuous increase in real wages was powered by constantly raising productivity. Since the seventies the US wage earners face stagnation or even decline of real wages in spite of a productivity that kept rising.

Figure 1. Wages and Productivity Development in the USA (Source: Wolff, 2009)

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The long term coupling of productivity and wages is at the heart of the American love affair with capitalism. The decoupling of productivity and wages since the late seventies had affected capital and labour in a very different manner[2] (Figure 1). Workers (i.e. wage earners) tried to protect family incomes from declining by working longer hours and by sending more family members to work. When this did not suffice they started to borrow.

On the side of capital this situation brought about a veritable profit bonanza. What to do with all the money? It was spent in (i) modernizing production (automation), (ii) in preparing massive operations of relocating production abroad, (iii) in mergers and takeovers (leading to considerable concentrations and emerging monopolies), and (iv) in speculative activities in financial markets. Many operations contributed to keeping wages low. In fact, even the low consumer prices achieved by relocating production to low wage countries like China, welcome to families coping with the new situation, are used as pretext to further bring down wages[3]. Many of the above-mentioned operations were costly (automation, modernization, mergers). It was predicated on the profit bonanza emerging from the decoupling of wages and productivity and deepened it.

Awash with liquidity, capital (the banks this time) looked for further opportunities of profitable investment. To stimulate the housing market seemed to be a good idea. Home-ownership was part of the traditional American Dream. To turn the dream into a market *capital had to work on both sides*: On the supply side the building industries had to be stimulated by cheap credits. But industries could only realize their profits if they were able to sell their products; the banks, in turn, depended on the building industries' ability to realize their profits in order to get back the money they lent. Given the stagnating wage situation banks had to intervene actively to assure the 'effective demand'. This led to issuing sub-prime loans predicated on the assumptions that the asset values of the houses would rise. In what eventually turned out to be a gigantic Ponzi scheme a housing bubble built up. American consumers went on a borrowing binge[4]: they were lured into buying additional consumer goods (such as cars) taking out further loans allegedly all covered by the rising asset values of their houses[5]. The wonders of the 'new economy' came to an end when the bubble burst in the 2007/8 crisis leaving many Americans losing their jobs, homes and property.

The rest of the story is well known: banks were bailed out by governments transforming the banking crisis in a national debt crisis which, in turn, required austerity measures. The effect was a dramatic increase in wealth and income inequality, epitomized in the Occupy Wall Street slogan "We are the 99 %"[6].

Like home ownership education is part of the American Dream. How to translate the educational dream into a market? We can discern a similar pattern. Again *capital works on both sides*. Let us look first at the supply side. Like all costs of social reproduction (and, indeed, environmental costs), capital tends to externalize training and educational costs. Even where training and education is publicly financed companies are required to shoulder part of the tax burden to fund education. The more of the cost burden could be devolved to the students the better!

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Human capital theory did lay the lead. Having calculated positive private returns to educational investment, it was clear that 'there is cream to be skimmed off', i.e. an investment opportunity. Quite in line with the new neoliberal hegemony in the eighties, state funding was cut back creating more space for private for profit providers. But also public providers had to demonstrate improved internal efficiency ratios (i.e. more through-put while state funding declined). Colleges sought succour in raising tuition. As a consequence tuition at public four-year community colleges did rise nine times faster than the median family income (Kirshstein, 2012; Figure 2).

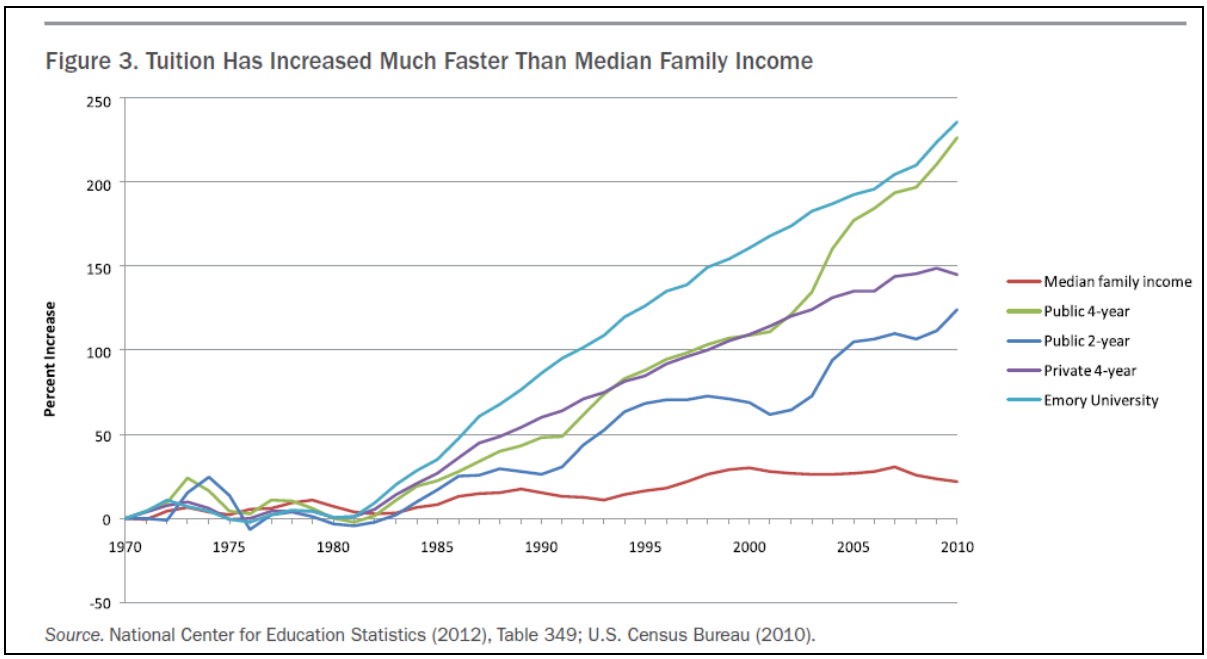

Figure 2. Tuition and family income (Kirshstein, 2012)

Looking at the demand side, investment prospects looked promising. First and foremost, because education was increasingly perceived as the only 'the only game in town', i.e. the only means for upward social mobility for all having forgone the opportunity of being born into a well-heeled family (Brown et al., 2011, p.135; Immerwahr, et al. 2010)! Human capital theory had done some spadework to creating the reality for this perception: even where role of education in skill-formation remained controversial, educational credentials were broadly introduced as screening and ranking devices. Hence the flipside of broadening access to education was that those without them were excluded from access to the labour market. It served graduates to lay (quasi-)monopolistic claims on well-paying jobs and served employers as a handy device for screening and ranking. This turned students increasingly in a *captive market*: you need a degree lest you are sent to the lower end of the job queue[7].

Still, 'urgent need' does not make 'effective demand'. Here again *capital worked on both sides*: having created a captive market (which led students in a sort of educational arms race) students need to get easy access to loans to pay for their education. Given the stagnant income and soaring tuition they had essentially two options: to combine study and work (becoming part time or distance students[8]) or to take out loans. Students used both strategies. Many had

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to take substantial loans (thus following the recommendations of the pundits in the media and in economics).

In April 2012 US student debts had run up to 1 trillion. The vast majority of the one trillion is held by Wall Street banks which securitized these loans, to sell them off with considerable profit. (democracynow, 2012) Wolff estimates that a student who accumulated $80,000 in debt for a four year BA degree would typically have to pay back $1000 a month from the sort of salary you get with a BA. (Wolff, 2009) Stripped of all consumer protection and being 'non-dischargeable in bankruptcy' the loans may drive students in a long-term debt peonage (Harvey in democracynow, 2012[9]). Business observer Bill Bonner sees a 'Student Loan Bubble' building up, set to be part two of the 'sub-prime disaster': "The feds paid for one heck of a lot of education, subsidizing students and colleges with trillions of dollars. … And they hand out hundreds of billions in loans, at low teaser rates (just like subprime!) to students, often to students who are unqualified and unlikely to get much out of it." (Bonner, 2012).

However, faced by these 'three headwinds' of raising tuition, an insecure job market, and colleges that are less able to help students (with jobs, loans or fellowships) many students blench at the prospect of a murderous debt burden (Wolff, 2012c). Wolff reports that the number of students enrolled in graduate schools have dropped by between 2 % and 3 % per year over the last two years, in spite of all the official rhetoric presenting education as a general panacea for all social ills. The figure would be substantially higher if one excludes from the sample the large percent of foreign graduate students (a sixth of the graduate student population, many of them would leave the US). If the picture of knowledge societies pitted against each other in fierce competition is correct, this indeed is a counter-productive development.

Distance education

Today distance education has lost much of the features setting it aside: Most universities for example (at least in the 'developed' world) have the technological capabilities of teaching at a distance. Hence many of the private colleges and universities, which "see the decline of public colleges and universities as competitive opportunity in a business sense", (Wolff, 2010, p.27) offer distance education courses. Since distance education lends itself particularly well to be set up as a business, the remaining section tries to point out what it means when the specific features of distance education are subsumed under the 'logic of capital'. The argument uses a diagram from Harvey (2010, based on Marx' second vol. of Capital) illustrating what Harvey calls the 'process of capital'. It is here applied to distance education.

The process starts with money to be invested in a production process. It brings labor and other necessary ingredients together to produce a commodity or a service, which is then sold, if all went well, at a profit which, in turn, is ploughed back to expand the business.

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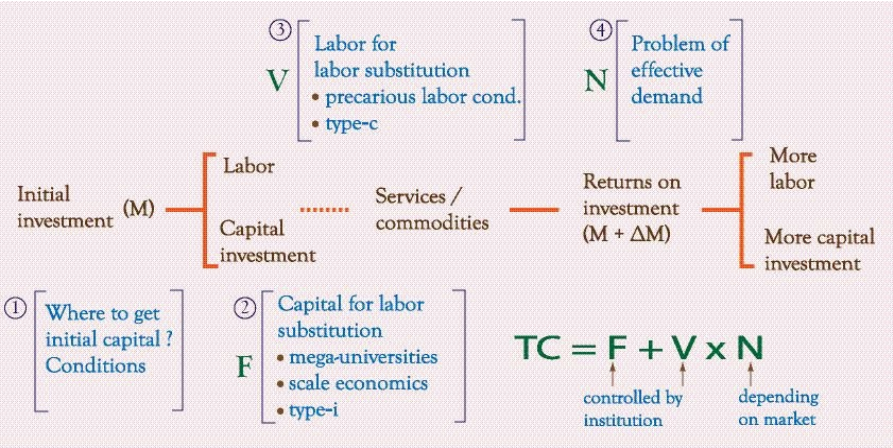

Figure 3. Distance education and the process of capital
Source: Based on http://readingcapital.org/ The distinction between type-c and type-i forms distance education relates to the acronym ICT (information and communication technologies) which comprises two different sets of digital technologies: Information technologies are akin to automation while communication technologies facilitate 'responsive communication at a distance'. (cf. Hülsmann, 2009) Using digital technologies to mainly implement traditional forms of distance education is referred to as type-i format, a type-c format focuses on interactivity. Both formats have a different cost-structure. (Hülsmann, 2006)

According to classical (and neoclassical) economics capital when operating under market conditions are subject to the coercive forces of competition which drive down prices close to the cost level. This tends to drive businesses into a profitability squeeze (Silver, 2003). The tactics businesses to escape the profitability squeeze include *geographical fixes* (such as relocation to low cost countries, which amounts to a *labour for labour substitution*) and *technological fixes* (such as automation, which amounts to a *capital for labour substitution*). That education has for long seemed impervious to market forces was due to the fact that, for obvious reasons, such tactics had not been applicable to education. Distance education has changed that. It uses both tactics: Unbundling the process of teaching allows shifting the locus of teaching to course development and hence a form of *labour for labour substitution*: Course development "is regarded as the academic teaching"[10] and remains the prerogative of a small group of tenured staff while for the 'coalface' work of contact with students is done by less costly adjuncts, hired at more precarious working conditions. (cf. Rumble, 2004). These tactics of labour for labour substitution is by no means prevalent only in distance education but a general trend in (not only) US higher education as the massive drop of the proportion of tenured faculty demonstrates[11]. The traditional claim for distance education to be more cost-efficient is based on scale economies, i.e. a form of *capital for labour substitution*[12].

If we set up distance education as a business in competitive markets profitability squeezes are hardly to avoid. Beyond the challenges already mentioned (such as deskilling, more precarious employment conditions) teachers face further challenges such as increased work load and acceleration. In the present regime of 'flexible accumulation[13]' (Harvey, 1990), the boundaries of the 'working day' are getting blurred again. The permission to 'do your work wherever you want' may really mean an obligation that you 'have to work wherever you are'. Being

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reachable all the time indicates the appropriate attitude[14]. All this produces stress: Burnout is a 'fashionable complaint' as it attests total dedication.

The Swiss economist Binswanger (2010) has nicely summarized the 'trinity of illusions' underlying the artificial construction of markets, including the education as a market: (i) the market illusion; (ii) the measurability illusion; and (iii) the motivation illusion. The illusion of an education market refers to the absence of a proper pricing mechanism; to substitute the market mechanism by indicator-led benchmarks set by rating agencies leads to distortions known from planned economies. It is predicated on the second illusion, the illusion of measurability; quality in education where it really matters cannot be captured by indicators or rubrics; in fact, it produces considerable damage by driving out good motivation by bad motivation, i.e. intrinsic motivation by extrinsic (indicator-triggered) motivation – which is linked to the illusion of motivation.

Conclusion

What we have done is three things: first we have shown that formal education since its inception was set up to prepare for the factory and the army. As such it is no wonder that it was not set up for joy but inherited the negative conceptualization of work as a disutility. Like work, learning is mainly based on extrinsic interactions leaving little room for joy. The basic conundrum identified was the problem of making intrinsic motivation work for externally-set purposes.

While this finding, valid as it is, remains rather abstract, the next part looked at the consequences of setting up education itself as a business and creating a student market. As in the economy at large, *capital worked on both sides*: creating space for the private providers and luring students in taking out large loans by chanting the mantra that education pays. Given that the student market is largely a captive market there is little choice. But *caveat emptor*: In times when "knowledge (is) a key source of company profit, … the task of business is not to pay more for it but to pay less." (Brown et al., 2011, p. 6)

Many distance educators wanted to open education for a broader base of formerly excluded people. They wanted them to develop personally and to prosper economically. What they did not want is sending them in a credentialing hamster-wheel of lifelong learning to prepare themselves for the next open job slot or ending up in a long term debt peonage.

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[1] Interestingly the calculation method of *rates of returns to education* (RORE) follows the method of depreciating machines (calculating the *internal rate of return* (IRR); Spraul, 2006). This nicely ties into the classical economic tradition where Adam Smith already observed: „A man educated at the expense of much labour and time to any of those employments which require extraordinary dexterity and skill, may be compared to one of those expensive machines." (Blaug, 1986, p.154, citing A. Smith).
[2] This decoupling of wages and productivity was due to a complex set of interrelated factors. They include the hegemonic shift away from Keynseanism to a neoclassical brand of economics (often referred to as market fundamentalism), a decline in commitments to the welfare state, the failure and collapse of communism and socialism as alternatives, technological revolutions (most importantly the revolution in information and communication technologies (ICT)), all reflected in a precipitating process of globalization. In fact, drawing 'causation arrows' between these factors makes little sense since all of them were both, causes and effects.
[3] The federal minimum wage in the US today is $7.25/hour; in 1968 it was $4/hour; but adjusted for prices it was $9.07; hence the real federal minimum wage has gone down by about 20 %. Inequalities between the average US worker (working fulltime) and the average CEOs (of the 500 biggest US companies) increased considerably: while in 1980 the CEO had 42 times as much as the average US worker the relation in 2011 was 380 times! (Wolff, 2013)
[4] "… every person in the (rich) United States has over the last 10 years borrowed about $4000 from someone in the (poor) People's Republic of China." (Brown et al., 2011, p.151)
[5] Don't miss the punch line: Capital having deprived workers from their traditional share in the rising productivity lent this money back to them for interest. (Wolf, 2009)
[6] "1 % of Americans took in 21.2 % of the total AGI [adjusted gross income] earned by all Americans." (Wolff, 2010, p.40)
[7] "What keeps students in school is the terror of facing a deteriorating job market without a degree." (Wolff, 2010, l.27)
[8] The apparent attraction for online learning does not lie so much in the attraction of technology but in coping with the requirements of the regime of flexible accumulation (Harvey): You need to be flexible; therefore you need to turn to online learning.
[9] Cf. also Antonova (2012); of particular interests are the merciless comments of many readers who just asked her stopping to "blame society for your bad decisions".
[10] "To be absolutely clear, where learning materials are produced for numbers of student ..., this is regarded as the academic teaching and is considered to be outside the framework of learner support." (Mills, 2003, p.104)
[11] Between 1980 and 2009 the proportion of tenured professors in the US fell from 57 % to 27 %. (Wipperfürth, 2009)
[12] A rather recent radicalization of scale economies-based distance education are xMOOCs (Massive Open Online Classrooms), presently offered mainly by brand name universities. Ideally course development is a spin-off from on-campus teaching and can be seen as sunk costs. The emerging business model for MOOCs seems to be based on the web 2.0 business model: offering something of generic interest for free and capitalizing on backstage deals with third parties. (Hülsmann, 2008) In this case, xMOOCs are advertised to companies to scan for talent on a global scale: „Providers of free online courses are officially in the headhunting business, bringing in revenue by selling to employers information about high-performing students who might be a good fit for open jobs", reports Young (2012). The other source of income will come from certification.
[13] Harvey (1990) distinguishes between a 'Fordist regime of accumulation' and the present 'flexible regime of accumulation'.
[14] Erpenbeck & Sauter consider the 'interiorisation of values' and attitude formation as part of competence development. To mold the ideal employee needs cracking the inner shell ('Labilisierung') and making him/her to embrace the externally set goals as his/her own.

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I FEEL LUCKY AND PROUD! THE SIGNIFICANCE OF DIALOGIC COLLABORATIVE GROUPS IN DEVELOPING PROFESSIONAL COMPETENCE AMONG AMBULANCE WORKERS

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Introduction

This paper seeks to explore education and learning related to development of professional competences among ambulance personnel, Paramedics. In discourses of adult and lifelong learning, aspects contributing or making it difficult to participate in adult learning programmes (Aspøy & Tønder, 2010) are emphasized. We know less about possible consequences of formal education on individual and organisational levels.

We want to pursue these issues by drawing on experiences from adult students in flexible and continuing education at Lillehammer University College (LUC), the National Paramedic Education (NPE, 60 ECTS). Drawing on qualitative and quantitative data, together with relevant theory on flexible and adult learning, we will analyse how the students experience the relevance of the programme. We put specific focus on a particular learning method and pedagogic principle – *dialogic collaborative groups*. This is one out of a range of learning methods in this programme. We want to highlight the focus on dialogic groups since it is a well established learning method and based on the assumption that participation in dialogues in heterogeneous groups might enhance reflection on activities, demands and challenges in students' daily work. This is relevant, since a central competence goal in the study programme is to be able to guide other colleagues and to communicate with other related professions, such as health workers, medical practitioners and so forth. Ambulance personnel are not familiar with higher formal education in general, and participation in dialogic groups as part of formal educational settings in special. We explore the relevance of dialogic collaborative groups, as it is integrated in the study programme as an obligatory element. The students are expected to participate in dialogue-groups with fellow students and colleagues at their own and other ambulance stations.

The following two questions are central in our study: How do Paramedics as adult learners experience their participation in reflective dialogues in collaborative groups across different stations (workplaces)? And how do they relate these dialogues to their own professional competence development?

Our main focus is on how students perceive their participation in terms of how they describe dialogic groups as relevant activities in terms of competence development. We highlight to what extent dialogic groups manage to connect learning in formal educational settings and the workplace as learning setting. We analyse how the students experience their participation in dialogic groups, how they manage their own learning across groups and across formal an informal learning contexts, and how their competences are being regarded and further developed in their daily work. We discuss the relevance of reflective dialogue for professional competence development. Our main intention is to suggest some criteria for analysing professional competence development by use of dialogic collaborative groups as a means.

We build on a socio-cultural perspective on learning (Säljö, 2006; Wertsch, 1998) highlighting learning as relational and as situated in social practice. By reflecting on and discussing a specific case and empirical findings within this theoretical frame we want to contribute to bridge a potential gap between formal and informal learning at the workplace. We argue that learning criss-cross formal and informal learning contexts. Hence, formal educational settings and workplace settings must be understood as connected rather than separate learning contexts, as is a widespread assumption in much educational research (Edwards et al., 2010).

We start by presenting our theoretical approach underpinning our design principles and way of arranging continuing education as teachers and instructional designers. Secondly, we briefly describe our case, its organization, the evaluation-approach and some results. We discuss the case according to the issues introduced above; opportunities and challenges in participating in reflective dialogic learning. Finally we sum up our thoughts and suggest issues for further attention and research.

Learning and reflection within a socio-cultural framework

According to the socio-cultural framework, learning is understood as relational and as occurring in participation with others in different contexts, and by using different resources (Säljö, 2006; Wertsch, 1998). In the particular study programme contextualizing this paper, such resources are dialogic collaborative groups, fellow students, teachers, books, and digital technology. The focus here is on dialogic groups. In the socio-cultural perspective, learning is not confined to the individual mind. By this we go beyond thinking of learning as occurring as a consequence of the didactic design and the arrangement of learning content (Dirckinck-Holmfeld et. al., 2009). Rather we understand learning as dependent on how the dialogic groups as resources are being used, re-negotiated and repurposed.

Dialogue, discussion and reflection have always been central in higher formal education. However, what is new, are opportunities for other kinds of interactions due to flexible arrangements and use of digital technology (Dysthe, 2001). In flexible education like Paramedics (see description below) students can arrange for self-directed and self-motivated dialogues in groups within their own workplace and across different stations. They can choose to use digital technology, like Fronter or Skype, or they can arrange for dialogic groups face to

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face. The core subject of this paper is to analyze how students experience the relevance of participating in reflective dialogic groups, that is, we focus on the learning potential of these kinds of interaction. We discuss the relevance of reflection and dialogue for their professional competence development as Paramedics. Measuring individual learning situated in an organisation is far from easy, since it is almost impossible to isolate individual learning as a consequence of specific activities (Dysthe, 2001). Hence, we focus on the *learning potential in human dialogues* according to how the individual student utilize this potential, which is dependent on a range of personal and contextual aspects (ibid.). In our context, it is for instance important how the individual position oneself and communicates within the group, but also how the employer arrange for communicative arenas at the workplace (this is an aspect we plan to study in the near future, see below).

In almost all of our study programmes we require collaboration as valuable, underpinning our arguments by building on theoretical insights about how people may learn in collaboration. Drawing on Wenger (1998), Sorensen (2003) provides some elements that are relevant to our purpose:

- People learn and become motivated in the intersection between reflection and dialogue with others.
- Collaborative learning implies a view of the learner as always being in a learning process and as being active in this process.
- Collaborative learning implies a view of the learning process as collectively constructed; it is a process that aims at maintaining shared conceptions by using language and by participating in communities of practice.
- Collaborative learning implies group discussion and interaction.
- Collaboration and interaction is a fundamental human condition and aspect of existence (p.23).

Inspired by these elements, the next sections presents how the programme in question is organized and how our students perceive and experience participation in dialogic groups.

Methods and data

We draw on systematic evaluations from three student groups representing a sample consisting of 120 students in total. Our data include questionnaires and informal talks with the students and feedback via e-mail and telephone. As for the quantitative part, we have used QuestBack, a net-based survey tool for organisation and analysis of data. The qualitative data consist of interviews face to face and by telephone. We analyse what the students tell us about the relevance from participating in dialogic groups according to the following themes: Organising groups at the workplace, use of technology, experiences from participating in groups at own workplace, experiences from participating in groups across stations, experience of competence development (knowledge, skills), and own positioning and identity in groups.

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National Paramedic Education as context for the study

National Paramedic Education is a continuing education for skilled Paramedics. A majority of the students in this case are men and between 30-39 years of age. An extensive part of all students have maximum three years of higher education. The employer covers costs in terms of tuition fees, travel costs and so on. The average time spent on studies pr week is between 1-5 hours. The most important individual motive for attending the programme is professional interest.

Figure 1. Ambulance workers in emergency vehicles (photo Jan Austad).

The study programme consists of 8 modules and provides 60 ECTS credits which corresponding with the first year in a Bachelor degree. The study program is offered nationally with students from all over the country. The main purpose is to graduate students with higher and specialized professional ambulance competence in terms of knowledge, skills and general competence, to use in professional practice as ambulance workers in the Norwegian ambulance service. The aim is that NPE provides increased competence in their future professional practice, and the education will also give the students higher ability to be responsible of professional development.

After completing the program, each ambulance-worker has developed their competence to act and evaluation skills related to their professional practice. This is based on the health legislation requirements for professional practice, and emergency medicine knowledge, skills and attitudes, based on established standards for emergency medical services outside the hospital.

The study programme model

NPE is a one-year study extending two years, and the students will be able to participate in addition to daily work. The study program is designed as a combined model which includes two teaching sessions of three days at campus, and individual- and group work during the periods between the meetings. By this, we provide a pedagogical model that helps adult students to cope with commitments in leisure time and work.

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The subject modules in the study program are as follows:

- Communication and ethics – 10 ECTS;
- Health law – 10 ECTS;
- Anatomy and physiology – 5 ECTS;
- Pharmacology – 5 ECTS;
- Emergency Medicine 1 and 2 – 15 ECTS;
- Traumatology – 10 ECTS;
- Operational ambulance work – 5 ECTS.

Working methods

Reflection and problem solving in dialogic groups are central, and are partly organized on the basis of relevant cases the students themselves bring into the programme. The groups are obligatory and they are composed on the basis of geographical location, gender and prior education. Due to geographical challenges, the students have to use technology like e-mail, Skype and the study's learning management system (LMS) to communicate. Each group consists of 4-5 students. The purpose is to enable the students to acquire subject matter and to share experiences across their daily workplace/station. In addition, the students have to attend teaching sessions at campus and read the curriculum literature. The sessions consist of lectures, practical exercises, group work, discussions and presentations. Each module has two obligatory assignments to be approved before the students may take the exam. Guidance is available mainly via LMS.

Figure 2. Paramedic-students working together in groups at campus (photo Andrew Thomas Koonce).

The students also have to work as a trainee over a period of 15 days at a relevant department in the health care service to achieve specific skills. This period can be completely or partially replaced by simulation.

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Figure 3. Students job training during education (Photo Jan Austad).

The students have to report from the visit and the report has to be approved to be able to take the exam. By passing an individual exam for each module, either at home or at Campus, the programme is completed.

Students' experiences from participating in dialogic groups

In this section we present some preliminary results from the study. We have selected some examples as relevant to highlight the research questions introduced above. A majority of the students expressed the relevance of dialogic collaborative groups at their work place to be "good"/"very good" in the survey. The same score goes for group work at formal sessions at campus, though these were more seldom arranged. Excerpts from the following students emphasize the results:

> *The significance is quite huge. You can share point of view and experiences with the group. In addition, you are given opportunities to work across longer time spans.*
>
> *It is important to help fellow students achieving a higher level.*
>
> *Very important because I was lucky to join a group that was functioning very well and I could spend time on professional matters.*
>
> *It is educative to collaborate with fellow students from all over the country.*
>
> *It is very important that all group members are devoted to the task and want to contribute!*

These comments express our purpose behind structuring collaboration and dialogue, inspired by Masons' (2003) quality criteria; to promote opportunities to express your own ideas and perspectives and encourage students to improve thoughts, ideas and arguments in their assignments. The comments also point at the importance of building knowledge together with colleagues/students.

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However, many students expressed their experiences in less positive terms, for instance that some members have to bear the brunt, and that some spent their time doing other things when attending sessions at campus. This group of respondents suggested individual assignments instead, requested more structure and facilitation from us at LUC etc. Their responses highlight the importance of composing efficient groups based on dedicated members, clear rules and structure.

Exploring the importance of group-dialogue, we have also discovered another, but not less important, consequence from participating in the NPE. This has to do with more overall effects on the organizational level, that is, the significance of formal education on professions. A majority of the students report that the educational programme has contributed to changes in their practice. In the future, we want to investigate this further to come to terms with what this is about; change in routines, ways of doing things, professional talk etc. Students report that the programme makes them feel more competent, comfortable and safe in their daily work: "*It is important that ambulance workers in Norway get a common ground*". Many students state that participating in the programme makes them: *"(…) feel lucky and proud!*" Such utterances suggest that formal education contributes to pride of the profession, an increased feeling of identity and affiliation as ambulance worker.

Discussion and conclusion

We know from research that dialogue in collaborative groups is vital in continuing education (Dirckinck-Holmfeld et. al., 2009; Dysthe, 2001). This paper illuminates the importance of dialog in such groups as learning resource among adult students. We argue that reflective dialogues in groups is vital and is enhanced by consciously building on learning theory conceptualizing learning as a collective and relational practice (Säljö, 2006). Working in groups contributes to sharing ideas, thoughts, knowledge, competence and self-reflection related to work-practice. Responses from students emphasize the importance of facilitating for efficient group work in terms of agreements, dedicated members and planning for predictability and well structured work.

More far-reaching and overall consequences from participating in formal education are the ambulance workers feelings of pride, identity and affiliation. That is, feeling happiness from being the chosen ones, to be a "Paramedic" with capitol P, and achieving formal documentation of professional competences. Our results indicate that we need further investigation into how employees and employers utilize knowledge and competences earned in formal education. This is defined as an unexploited issue in research on adult learners (Danielsen & Pettersen, 2008). Our planned study can hopefully contribute to fill this gap.

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ATTITUDES OF THREE GENERATIONS TO SMARTPHONE IMPLEMENTATION

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Introduction

The disparity between educational standards and reality outside educational institutions is increasing. Alternative learning infrastructure such as mobile technologies are becoming more common, and are challenging long held, traditional modes of teaching. Benefits of mobile learning are numerous and are expressed in different facets of education including cooperative learning, contextual, constructivist and authentic learning. Mobile-based learning enables location-based learning, among other flexible, unconventional teaching strategies. In particular, they offer knowledge-based learning tools allowing learning outside the classroom (Squire & Klopfer, 2007) as well as allowing learners to engage in activities ranging from real-time or lapsed communication and collaboration with colleagues to location-based tasks. In addition, the mobile platform offers many documentation and interaction options that allow us to examine alternative digital assessment methods.

Educator attitudes toward wireless devices are mixed. There are teachers who report that using them increases the interest and involvement of students, as well as addressing different learning and teaching styles (Lamscheck-Nielsen & Jakobsen, 2009). Wireless devices are perceived by some teachers as a threat to their authority and a distraction to the educational process. To change the perception of mobile devices as a threat, the authors propose to examine the contribution of such technology to teaching and learning. Harnessing the availability of mobile devices and mobile Internet technology for teaching and learning can empower learning anywhere and at any time as well as allowing better access to knowledge. This in turn makes learning relevant and adjusted to the information-savvy society in which we live.

Teaching in the 21st century, a time in which the ICT revolution is in full swing, requires teacher and student preparation to educational settings using relevant, meaningful and challenging teaching methods, and by leading innovative pedagogy. In a reality where students own multimedia and personal communication devices, and are constantly acquiring new skills of information sharing and communication (Sharples et al. 2007), traditional classroom models where exams are held, and content and dialogue is dictated by the curriculum and managed by the teacher do not fit in easily. Traditional schooling is very different from the wealth of interactions that students experience outside of school with use of

cellular phone calls, text messaging and virtual communities. These two worlds come into conflict when children bring mobile devices to class or share homework online. Rather than focusing on the threat of mobile technologies to formal teaching, technological changes can be regarded as a positive challenge to schools, and a means of bringing teaching into the mobile technology era.

Proper harnessing of the technological means available may facilitate flexible learning, that is, learning without the boundaries of time and place, characteristics that are becoming increasing in demand in the 21st century.

21st century skills in the school context

As a result of the accelerated technological development that occurs all around us in the digital age, we are required to adapt to frequent changes in our environment. The majority of the teaching staff in teacher training programs was not born into the digital-informational revolution, and so must undergo training themselves to prepare for digital proficiency. This generation of technology users has been called "Generation X", or "digital immigrants", and it is they who will educate Generation Y – the generation born into the information age (Prensky, 2009) and the ones who will educate and teach the "Z Generation". The education system must therefore modify its teaching methods for the oncoming wave of digitally-proficient students, their skills, experiences and needs.

Teaching in the current era requires educators to consider technological changes and to take into account the gap between classroom practices and practices beyond it. For the increased incorporation of technologies, Daggett (2005) argues that a shift in focus is necessary, from teacher-centred-instruction to student-centred learning in which the teacher takes a secondary position as director, guide and supporter of the learning process. According to Daggett this will help students develop leadership skills, teamwork and other skills necessary and relevant to challenging issues in everyday life and the needs of the future workforce. Additional skills required are creativity and ingenuity, communication and collaboration, critical thinking and problem solving (Salpeter, 2003). Training programs that take into account the technological changes must be committed to address the reform needed in teaching methods and take advantage of the potential of mobile technologies in education.

Mobile technologies, teaching and motivation for learning

Smart mobile devices allow the collecting, organizing, storing and presenting of information. They are equipped with advanced multimedia players, provide access to recently updated information, store contacts and allow for real time communication using a wide range of Internet environments. They also provide the possibility to synchronize information regularly and access it anywhere, any time.

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Many cellular tools and applications are being developed that were not intended specifically for educational purposes, but can nevertheless be used in the process of teaching and learning. One example of this is the QR Code generator. Another example is augmented reality digital information, known as "AR". These technologies bridge the gap between physical content, since they enable the accessing of digital content based on printed materials (Johnson & Adams, 2011). These features of mobile technology require attention from educators in order to harness these resources to teaching and to formulate and adopt an updated pedagogy.

One promising aspect when considering the use of mobile technologies in education is student motivation. Learning with these technologies is often perceived by students as informal, enjoyable and motivational, even if the use does not involve interactive games. Fundamentally informal learning emphasizes learners' goals and interests rather than learning goals, and therefore has the effect of strengthening the internal motivation of the learner (Sharples, 2007). Students engaging in mobile learning report that this gives them a sense of heightened control, ownership, fun, allows enhanced communication and enables learning in context (Jones et al., 2007; Sharples, 2007).

Mobile technologies offer many options that can be useful in teaching. Laurillard (2007) suggests creating learning activities that take advantage of the uniqueness of the technology. These technologies offer discovery and study of physical environments, maintaining synchronous and a-synchronous dialogue with colleagues. Mobile technologies also offer many options of information capture, access and manipulation. Enhanced feedback is also possible, as mobile platform allows for the tracking of processes.

In this context, Laurillard suggests adopting a pedagogy that promotes quality learning and is more sustainable and flexible than traditional teaching methods. It is crucial to try to understand the type of exercises required for learning complex concepts and higher-order thinking skills, and develop pedagogical applications that produce the desired learning results. Like Laurillard, Sharples (2007) also claims that in order to develop innovative educational activities, it is necessary to integrate technology and learning in a manner whereby pedagogy and learning theories are the driving forces, rather than the technology. Naismith and Corlett (2006) also provide a review of technologically-oriented pedagogies. They state that when developing mobile technology-oriented activities it is important to make use of principles of human-machine interactions. They suggest taking advantage of the unique technology affordances that can contribute to an enhanced user experience. Planning and design of learning activities must be specific, goal-driven. At the same time, the planner must take into consideration the added value of mobile technologies, to allow for teaching in the best possible way using the chosen teaching tool.

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Pedagogical Uses of Advanced Mobile Devices

Wireless devices serve as a "compass" for finding new information (Vandi & Djebbari, 2011) and enable access to location-based information on the basis of interest and personal need (Hicks & Sinkinson, 2011). Among the advantages of mobile learning are the ability to design cooperative, contextual, constructivist and authentic learning. This type of learning integrates mobile learning and flexible teaching strategies.

Mobile devices can be used to investigate new content by turning passive data sources that contain huge amounts of information to interactive objects (Vandi & Djebbari, 2011). This makes learning more relevant, allowing learners to access information at the right time and place. Providing the opportunity to interact with the learning materials enables a kinesthethic learning approach. The use of space-based technology will grow as educators become aware of the existence of free and accessible technologies, their ease of use and the level of their mobility. Mobile resources can be an ideal way to provide immediate assistance to students through the devices they own and use themselves, to provide background on what is learned and enable individually-paced learning (Chen, Teng, Lee & Kinskuk, 2011). The aim is for students to efficiently and effectively use mobile devices to enrich the learning experience (Fasimpaur, 2011). In addition, orientation-enabled mobile devices have an advantage in reducing memory load and real-time support satisfaction.

Most teachers are aware that mobile devices often constitute a distraction to students. With no additional cost to schools, and without any additional efforts of teaching new technologies, teachers can harness technology that already exists. They must only ensure lesson-focused use of the devices, and eventually mobile technology can help facilitate classroom management processes.

Incorporating mobile technology in teaching can provide a chance for educators to bridge the gap between the school environment and the extracurricular environment. Allowing learners to use technologies with which they are fluent can empower students and enrich learning, and make it more meaningful and relevant. Embracing these technologies that are broadly regarded as a nuisance, if used correctly, is certainly more constructive than the attempts to fight and resist technology in the classroom.

In conclusion, mobile phones and mobile applications offers a wide range of opportunities to educators and learners as well as the community by preparing its members for the wide range of subjects and skills necessary for the 21st century. The ubiquity of mobile devices today along with the empowering potential of these devices makes mobile technologies a great candidate for integration in learning, and useful for the skills needed for employment in the future. While it is clear what educators and pedagogues think of mobile integration in the classroom, student opinions are still underexplored. The aim of this study is to examine student and instructor attitudes toward the implementation of smartphones in education: the types of usage they suggest and whether they think that smartphones should be implemented in academia as well as in schools at all.

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Participants

This study was based on experience with three factions: middle school students, college students and their instructors. The student group consisted of 32 seventh grade students who used their smartphones in learning on the topic of Australia, and another group of 35 eighth grade students who learned a science unit using augmented reality smartphone technology. The college group comprised 42 students studying towards a Master of Education degree in teaching combined with a teaching diploma. The average age of the students was 32 years old. They came from various disciplines taught in Israeli high schools, such as science, arts, history, and literature. The college instructors, 18 in number, averaging in age of 52, were from the science discipline, math, computer education and art.

The activities implemented

As part of their eight-hour studies on Australia, the seventh grade students completed the smartphone-based activity comprising a two-hour lesson. The eighth grade students studied a science unit on Interaction, using augmented reality, which included watching animations, videos, pictures and conducting shared activities.

The college students participated in a mandatory course on innovative technologies in education through a period of one academic semester. As part of the course, students researched a given topic and either presented it to their peers in class or prepared a relevant activity in which their peers participated. Two students conducted their smartphone-based activity with their peers during a 90 minute period. To complete several sub-activities, the class was divided into 9 groups of 4-5 members. The college instructors participated in a 4-hour workshop in which they were instructed on mobile technology affordances. During the workshop, the lecturers came up with ways to implement various applications of mobile technologies in their teaching.

Instruments

Data presented in this study regarding the middle school and college students was collected before the activity through a pre-questionnaire. In addition, during the lesson immediately following the activity, a focus group was assembled in which both school and college students reflected on application of smartphone usage in their various disciplines and wrote their suggestions in the class forum. A post-questionnaire was administered after the focus group discussion, and students posted their ideas regarding smartphone implementation in class. The results of these questionnaires and the questionnaire given prior to the activity are presented in this paper. The questions focused on students' attitude toward implementation of smartphones in education and its contribution to learning. They were asked, whether they think teachers in schools should implement smartphones in schools. Middle school students were asked to suggest ways in which smartphones could be incorporated into their learning. College students were also asked whether they would implement it in their classrooms and whether they think that instructors should implement smartphones in the institution in which

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they are being trained. In addition, throughout their course college students reflected on their work in a personal blog, where they described the process of lesson planning, and shared their work and thoughts with their peers and teachers. Alongside practical topics, the underlying pedagogies were taught and discussed.

The instructors filled in a short questionnaire prior to the workshop and at the end of it. During the workshop and as part of it they were asked a few questions which they mostly answered through their smartphones.

The study was conducted through qualitative and quantitative analysis. Relevant information was collected based on the questionnaires, correspondence and personal journals and interviews.

Findings

Among the 67 middle school students, 78 % owned a smartphone and 22 % did not, among the college students who filled in the questionnaire (37), 74 % owned a smartphone and 26 % did not. Among the 18 instructors, 78 % owned a smartphone and 22 % did not.

There was a difference in the difficulties various groups face. While the middle school students almost did not experience technical problems, the college students and their instructors needed much more technical assistance during the activities.

Middle school students found the activity interesting (M=4.0) on a range of 1-5. They learned new things (M=3.5) and felt that they benefited from the shared activities (M=3.8). Students expressed willingness to conduct such activities in the future (M=3.5); they said they would recommend such activities to their friends (M=3.5) and would be excited to develop an activity of their own (M=3.8). College students were sceptical regarding the implementation of smartphones in Education. There was no significant difference between the pre-test and the post-test regarding the extent to which college students intend to incorporate smartphones in their teaching at school. There was also no significant difference in the extent to which they thought that teachers at school should implement smartphones in their lessons and in the extent that lecturers in the college should implement smartphones in their lessons. College instructors considered the potential of the tool, but felt the need more training prior to the implementation.

A difference was noted in the way the three generations relate to smartphones and mobile technology: Middle school students use their smartphones to download music, Facebook, listen to music, download applications and contact friends and family. If mobiles were allowed in class, students stated they would use them for translation, recording, taking notes, taking pictures of the board instead of copying the material, use internet to clarify issued and expand knowledge, calculator, text to voice software and spellchecking. In the post-test they suggested using their smartphones to conduct exams, to view maps in geography, learn history facts and solve math problems. Some students felt that using the various functions smartphones offered

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could save a lot of time in the classroom. College students, on the other hand, use smartphones for surfing the Internet, as a GPS, for learning management, Facebook, recording lessons, chat, watch alarm and taking notes. Most instructors use smartphones for conducting calls, time management, mind maps, keeping a calendar, and very few other applications, which they discover gradually. One instructor stated using the smartphone as a wireless modem.

As mentioned above the middle school students found the activity interesting (M=4.0), learned new things (M=3.4) and benefitted from the collaborative work. Participating students enjoyed the activity (M=3.0). For most of the students, this activity was different from the usual types of lessons they experience. They learned an innovative topic and had to participate in an activity designed by two of their peers. The students who designed the activity received guidance during a six weeks preparation phase. Following the activity, students presented their ideas regarding smartphone incorporation in class in their various disciplines giving ideas in such fields such as: History, Literature, Biology, Physics, and Communications are but a few. There was no significant difference between the pre-test and the post-test regarding the extent to which students intend to incorporate smartphones in their teaching at school. Students mentioned the fact that not every student owns a smartphone, and were concerned that students will access improper content on school time. Teachers should be aware of these possibilities.

College instructors were practical and used the workshop in order to plan projects that would benefit from the advantages mobile technologies offer. Ideas they had included using smartphone applications to collect data and pictures on bird nesting while synchronizing the information collected from various locations into a common data base; another activity planned included using smartphones for nature walks and educational tours, which are common in the Israeli education system, using layered activities to enable students to collect and access geological information, botanical information etc. For both teachers and students, participation in smartphone-based activities was eye-opening: it was more of an experiential teaching experience than any lecture could be. After the activity, students were less sceptical about the potential of smartphones in education. Students that had opposed using smartphones in schools prior to the experience changed their opinion following it, and commented on the advantages and abilities of this tool.

Further examples of activities of location-based learning implemented by the students and instructors and further findings will be presented in the lecture.

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Conclusions

Middle school students were very excited about the prospect of incorporating cell phones into their learning. College students, on the other hand, were very reluctant to implement smartphones in their classrooms. College instructors were ambivalent about integration of mobile technologies in their teaching.

One reason that the college students' attitudes did not markedly change after the activity could be that students who participated in this study are still in training. When they begin teaching in schools, they will first need to make sure they can establish themselves adequately in their new setting. Only then will they be ready to lead new changes. Similar conclusions were reached in previous studies, regarding the need to conform in order to survive the difficult first years in teaching in relation to computer use and other new technologies of the past.

College instructors need massive training and use very few applications related to their expertise. College students need to be taught the best methods, to help them recognize the value of mobile technology.

Once teachers experience the implementation of an activity with mobiles and overcome technology difficulties, they start considering interdisciplinary activities such as combining English and history lessons, exposing the students to art, music, architecture and by the by gaining reading comprehension, grammar and vocabulary.

Another reason for the students' lack of perspective shift may be that the activity in which they participated wasn't directly related to their area of expertise. Due to this, its impact on them was not as effective as it could have been. It was also short, so the opportunity for a profound reversal of student opinions was limited. Yet another reason is cultural: the Israel Ministry of Education does not regard implementation of this type of technology positively. Most current educators are also not very receptive to the changes that come with new technologies.

As for college instructors, they are not aware of the potential the technologies offer, but need more exposure to the value of technology and time to become adept at using mobile technologies before they are ready to incorporate them into their teaching. There is a gap between the three groups and in the transition period there are benefits to act side by side. One solution can be for instructors to harness the technological abilities of students: teachers can ask assistance from a small group of students in using the technologies with which they are so familiar, thus empowering the students and acquiring the help they need.

This study sheds some light on the questions that each new technology raises during its first stages. As students stated, it is important for teachers to know the affordances and benefits of this technology, as well as to be aware of the difficulties that are part of the process of implementation of a new technology. Through slow, gradual introduction of the technology into the classroom, teachers can gain pedagogical experience without being overwhelmed.

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EXAMINING THE CULTURAL COMPONENT OF PLAR: PRIOR LEARNING ASSESSMENT & RECOGNITION FOR DISTANCED EDUCATION STUDENTS IN MYANMAR

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Introduction

This paper draws on theories from the field of intercultural communication to explore cultural considerations in the implementation of a Prior Learning Assessment & Recognition (PLAR)[1] process with mature adults in Myanmar (previously known as Burma) who were seeking to earn a Canadian university credential via distance education. PLAR offers mature students the opportunity to accelerate their studies by accrediting learning gained from informal and non-formal sources. The PLAR process requires students to express such learning in terms of formal learning outcomes, either the outcomes of specific courses or broader outcomes associated with a program. This learning is typically expressed in a portfolio, which includes a narrative description of learning, supported by documentary evidence such as work samples and letters from supervisors (Freisen & Wihak, 2013).

A recent, large scale study in the United States and Canada has demonstrated that adult students who earn credits through PLAR not only complete their studies more quickly, they earn GPAs (Grade Point Averages) as high as students who do not use PLAR, take more courses, and have greater persistence towards program completion (Klein-Collins, 2010). That is, PLAR has strong potential to enhance students' motivation to persevere with distance education programs. In many countries (e.g. Australia, the United Kingdom), PLAR has become a central feature of lifelong learning policies, with close linkages to National Qualifications Frameworks (Morrissey et al., 2008).

While some research has been conducted on the use of PLAR with immigrants to developed countries (Guo & Andersson, 2006), no research exists on the exportation of PLAR to a different socio-cultural context in conjunction with exportation of higher education via distance learning. Having received little empirical attention, the cultural issue in PLAR is emerging as an important research question (Harris & Wihak, 2011). Since the theoretical frameworks commonly used in PLAR research do not address cultural issues, we drew on the intercultural communication theories to frame the research presented in this paper.

Intercultural Communication Theory

The field of international education encompasses situations where students from one culture and/or nationality engage in studying a curriculum created by another culture or nationality, as in international distance education. To understand how best to assist international students, educators have been drawing on theories of intercultural communication, which draws on theoretical perspectives from psychology, anthropology and sociolinguistics (Martin & Nayakama, 2007). By examining cultural differences, a better understanding of the challenges in intercultural exchanges can help to prepare and support educators as students from around the world negotiate a Canadian educational experience.

Hall (1976), generally considered the father of intercultural communication theory, identified high context and low context communication styles. In high context cultures, the communication is based more on body language, and shared understanding of subtle messages than on words. There is no need for many words because everyone has shared experiences and knowledge. The message may also be indirect. In other words, the audience has to consider the situation and fill in the meaning based on shared values and behaviours. Details are not important, and the inclusion of too many details could be construed as being rude because the audience is intelligent enough to figure it out on their own. On the other hand, low context cultures rely on the words and expect that the message is clear and direct to avoid confusion. While low context cultures do notice non-verbal aspects of communication, they tend to rely on words to convey meaning. They may feel a need to speak and may be uncomfortable with silence.

Hofstede (2001, 2010), another significant figure in the field of intercultural communication, developed a model and measurement tool that used a 100 point scale to rate each of 76 countries on five dimensions: power distance (PDI), individualism/collectivism (IDV), masculinity/femininity (MAS), uncertainty avoidance (UAI) and long-/short-term orientation (LTO). The resulting scores can be used to distinguish amongst cultures. Although originally intended for use in the field of international marketing, the scale has been embraced in disciplines such as cross-cultural psychology and education, as well as intercultural communication.

In addition to these theoretical perspectives, the authors brought their experience in teaching in different cultural contexts to the tasks of data collection and analysis. They were aware that even if the individuals seeking PLAR credit are fluent speakers of English as a Second Language, specific English vocabulary cannot be assumed to translate directly to conceptual understanding when the concepts are come from a very different cultural milieu (Wihak, 2005). We anticipated, therefore, that the language used in the PLAR process might pose conceptual difficulties for non-Canadian students.

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PLAR and Intercultural Communication

In creating a PLAR portfolio, the student has to communicate his or her learning in terms that make it recognizable as college level (Fiddler, Marineau & Whitaker, 2006). This articulation poses a significant challenge even when the student and the assessor are from the same culture (Conrad & Wardrop, 2010). When the student and the assessor are from different backgrounds, and particularly from Asian versus North American backgrounds, Intercultural Communication theory suggests additional complications could arise.

A Canadian PLAR portfolio can be seen as low context (Hall, 1976); the student must include specific, explicit details about acquired knowledge and skills with supporting evidence. Asian cultures, in contrast, have been described as high context (Martin & Nakayama, 2007), requiring Asian students preparing a PLAR petition to shift to a low context communication style.

Hofstede's data (2001, 2010) suggests that Western countries and Asian countries differ significantly on a number of the dimensions his research identified. North American countries tend to have lower PDI (acceptance of power inequalities), higher IDV (loose ties between individuals), and lower UAI (tolerance for ambiguity) than countries in Asia. These differences could be expected to affect the experience of Asian students undertaking a PLAR process developed in Canada. In the PLAR process, the student is asserting that his or her learning is equal to that which is transmitted from traditional authorities (i.e. college professors), which could be difficult for students from high PDI cultures. The PLAR process also requires the student to claim specific achievements as his or her own, a task that could be very hard for students from cultures with low IDV (i.e. high collectivist) tendencies. The PLAR process PLAR challenges tolerance for ambiguity (UAI) since the way to best express learning and the likely result of a PLAR petition are not highly specified in advance.

Context and Setting for the Study

The site for this research was a private Training Organization in Yangon (former capital city of Myanmar) that aims to assist people from Myanmar to acquire an international university credential, as Myanmar credentials are not recognized outside of the country. For students who wish to pursue graduate level education or a professional qualification outside of Myanmar, they must first complete an international credential, which adds even more to the cost of obtaining higher-level qualifications. Within the country, an individual has a much better chance of employment if s/he has gained an international degree.

The Training Organization served adults who had left the formal education system, providing English as a Second Language courses, computer courses, and university preparation classes. The Training Director, a Canadian living in Myanmar, who was familiar with distance education and PLAR, recognized they could shorten the time and money needed to gain an internationally recognized university credential. She therefore approached Thompson Rivers University's (TRU) Open Learning Division about a joint action research project.

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The role of the Training Director in the action research project was to serve as the PLAR Advisor, guiding her students to prepare PLAR portfolios, using TRU's format and criteria for demonstrating competency in eight areas: communication, information organization, problem solving/decision making, numeracy, critical thinking, intellectual maturity, independent study and learning skills, and applied knowledge and abilities. Using the same portfolio development materials available on-line to TRU's Canadian students, she offered an 80 hour portfolio development workshop. This support, although more than offered to TRU's on-line students, was similar to assistance given at other Western universities.

Following similar procedures to those normally used with TRU's distance education students, two PLAR assessors evaluated the students' written portfolios independently and then conducted joint interviews with each student to determine what credits might be awarded. Because of the poor telecommunications infrastructure in Myanmar, the evaluation interviews were held face-to-face, rather than by teleconference, which is the usual practice in Canada.

Method

Participants

Fifteen Myanmar students (8 males, 7 females) aged 22 to 37 years participated in the PLAR portfolio development workshop while thirteen submitted their portfolios for evaluation. Eleven completed the evaluation interviews and received credit awards towards a Canadian credential.

Data collection and analysis

Qualitative data was collected from the student participants, the PLAR Advisor and PLAR assessors through observation, interviews and questionnaires in two phases. In the first phase, the second author went to Myanmar to observe students as they worked through the PLAR training. Observations and initial interviews took place over two weekends, for a total of 24 hours of observation over four days. Immediately after the observations, loosely structured interviews were done with students, each lasting between five to ten minutes. A few weeks later the PLAR trainer was interviewed. This data collection phase occurred before to the students completed their portfolios.

The second phase of data collection occurred after the PLAR portfolio assessment process was completed. Students were given a list of questions after the assessment interview with the PLAR assessors. Individually, they responded online within one month, before being informed of the results of the portfolio assessments. The PLAR assessors also contributed their field notes concerning their experience of the assessment process.

Both authors reviewed all data collected and triangulated the different sources with the participant data being considered the primary source. Both authors identified emerging themes and supporting quotations individually that were later validated with each other.

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Findings

On the basis of their work-related learning, all eleven participants received the maximum allowable PLAR credit at the lower level (1st and 2nd year university) and some amount of upper level credit (3rd and 4th year university); three students received the maximum amount of upper level credit. With regard to the participants' subjective experience of the PLAR process, four primary themes emerged from the data analysis.

Distinguishing Knowledge from Skills

Although the students' were perceived as being high-level speakers of English, 11 of 15 students who began the portfolio process described difficulty in understanding how to distinguish between *knowledge* and *skills*, as they were required to do in preparing their portfolios. From their interviews during the portfolio development workshop, example student comments were:

> *Yes, there was a big confusion between understanding the skills and knowledge. Thus, I had to struggle to make it clear... [Student E]*

> *The word "Knowledge" seemed very wide for me to explain...it was quite difficult for me to know what I have really known, what kind of specific knowledge I have had. [Student N]*

Modesty

The PLAR portfolio requires students to make strongly stated claims about their own learning in the form of "I know this" or "I can do that". When the second author was observing the portfolio development class in progress, the PLAR Advisor informed her that the students were shy about promoting themselves. Comments taken from the students' interviews confirmed this insight:

> *[In] Myanmar culture… we are very shy and a bit ashamed to talk about ourselves. So if we talk about ourselves…a lot or always people think that we are a bit crazy… [Student B]*

> *In my culture, people never tell their own story, but others tell others' story when they have done great things. [Student G]*

When asked about the portfolio process after the evaluation interview was complete, however, it appeared that the PLAR experience might have impacted this cultural attitude.

> *I had to change the way I think about myself and the way I express about myself. I had to be confident in myself and explore myself (kind of evaluate yourself). [Student K]*

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> *I got a thought that being…low profile is not suitable for anywhere. People should show up what is their profession. It is just like…promoting a branded product. [Student M]*

Impact of Mentoring

During the training, the first author noted that students needed multiple examples and many opportunities to practice the self-reflection and articulation that needed to be evident in the portfolio.

> *I was a bit worried about that because…they would want to know, okay well, what am I supposed to say…and it's very much focused on the right answer... [PLAR trainer]*

> *… [T]hey come from a culture that is very context oriented, so that they are used to sort of telling a lot, giving a lot of background for things. But identifying what background is actually relevant and what isn't really relevant was, I think a bit challenging for them as well. [PLAR trainer]*

When asked if there were any specific incidences where students demonstrated that they had breakthroughs or particular struggles, the PLAR Advisor shared this incident:

> *We did a sample interview with a [participant] who is a teacher who said oh no I don't identify with the knowledge that you say [I] have and we said, well she has knowledge of how to communicate to people of different cultures. And she disagreed…[O]bviously, you know the difference between how to interact with a Buddhist person, a monk versus somebody else from a western culture, and she just light-bulbed at that time, she was like, ahhhh, I get it!. [T]he entire class…clicked in that moment…[T]here are things that we don't even recognize as being knowledge because it's so passive…are pieces of knowledge that are relevant to this project. [PLAR Trainer]*

Students' comments also emphasized the importance of the coaching they received on portfolio preparation:

> *Before I started the portfolio I was not so sure how it is but later on the process and after the training from Teacher, I gained clear idea that how it is like. [Student B]*

> *It was not that easy to change your own communication style. But I had to, otherwise it wouldn't work (both for the PLAR written presentation and oral interview). [Student K]*

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Difficulties with supporting evidence

For the Myanmar participants, obtaining documentary evidence to support their learning claims proved challenging. Beyond the difficulty that their documents were not written in English, they described several unexpected obstacles relating to cultural and communication and infrastructure realities.

> *[W]e have to bribe somebody to get some recommendation. [Student J]*

> *As I am from…far away from Yangon, it is a little bit difficult for me to collect within one or two months… [T]he internet connection in Myanmar is unreliable… …there are some people who cannot use internet as we live in…the remote area…[Student G]*

Discussion

In this study, we set out to explore cultural issues in the exportation of PLAR to different cultural contexts, attendant on the exportation of Western university education via distance learning. Because PLAR is a proven way for adults with learning from work and life experience to reduce time and costs of degree completion (Klein-Collins, 2010), the question of what happens when PLAR is shifted to a new cultural milieu is an important one. The findings of this study indicate that PLAR petitioners from an Asian cultural context can be successful in developing PLAR portfolios that demonstrate their learning against outcomes derived from the Canadian academic context. The second important finding is that cultural factors do impact the experience of creating a successful PLAR petition, adding unexpected challenges. These challenges have to do with understanding central concepts used in PLAR, adapting to different cultural norms, and navigating practical difficulties.

In Canada, the terms "knowledge" and "skills" are often used together in education or human resource management. Knowledge is usually understood to refer to a cognitive activity, while skills refer to physical or manual abilities (c.f. Winterton, Delamare-LeDeist & Stringfellow, 2005). Although all students were fluent English speakers, the distinction between "knowledge" and "skills" proved baffling to them. While this distinction is routinely made in Western PLAR processes, as it is in Western educational institutions and workplaces, it apparently does not have a counterpart in Myanmar culture. At a minimum, the participants' difficulty in this regard raise a strong warning flag about taking PLAR concepts from one cultural setting and applying them unproblematically in a different one. Whether this represents a de-valuing of culturally different knowledge (Guo & Andersson, 2006) is a moot point. The study participants were eventually able to grasp this foreign concept and use it successfully to express their learning. Nevertheless, they may indeed have possessed other, culturally specific learning that could not be expressed in these terms.

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The question of the inhibition against self-promotion in Myanmar is another clear example of how cultural factors impact PLAR. According to Hofstede (2010), Asian cultures exhibit a much more collectivist tendency compared to Western cultures, which have strong individualist tendencies. Individualists are more likely to be comfortable standing out, as opposed to collectivists whose orientation is toward group effort. This cultural difference is reflected in the strong reluctance of the Myanmar students to make explicit statements about their accomplishments.

The PLAR Advisor role, played by the Canadian, Myanmar-based Training Director, was key in assisting the students to overcome the difficulties discussed above. The mentoring she provided supported these students to meet the challenge of shifting from high context to low context communication style (Hall, 1976). She also helped them understand the open-ended nature of the PLAR process, which conflicted with their desire to avoid uncertainty, a characteristic found in Asian cultures to a higher degree than in Canadian culture (Hostede, 2010). Indeed, the strength of the students' comments on the importance of the mentoring they received, as well as the observational data, suggest that mentoring from a person familiar with both Canadian educational expectations and local culture will be a highly desirable feature for successfully implementing a PLAR process in conjunction with exportation of Canadian higher education via distance learning.

The Myanmar students encountered practical difficulties in obtaining supporting evidence for their portfolios. While the difficulties (e.g. poor internet access) may be specific to Myanmar, they serve as a reminder of the importance of ensuring that necessary infrastructure supports are available when migrating a distance delivery program to a new location. Cultural acceptance of bribery as a common practice would also need to be addressed in designing PLAR implementation.

In conclusion, the results of the pilot project did demonstrate that students from an Asian cultural context were able to succeed in using a PLAR process developed for Canadian distance education students. The research also showed that Intercultural Communication theory was useful in highlighting difficulties stemming from cultural differences that the students encountered in preparing their PLAR petitions. It is encouraging for future implementation of PLAR for distance education students in a non-Canadian culture that these difficulties could be overcome through providing assistance from a guide familiar with both cultural contexts.

Afterword

Several of the students who participated in the pilot have gone on to complete distance education courses through TRU. They are also exploring how Open Educational courseware could be combined with existing challenge exam programs to reduce even further the cost of acquiring an international credential.

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[1] PLAR is known by many different acronyms. The European Commission has adopted the term *VNFIL* (Validation of Non-formal and Informal Learning). RPL (Recognition of Prior Learning) is also widely used.

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THE JOY OF LEARNING IN LATER LIFE – THE AP(P)TITUDE OF TABLETS FOR SENIORS

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Seniors, Learning and Tablet-PCs

In Europe a large number of citizens are still not eIncluded because they lack the necessary eSkills. The digital divide is especially true for the third agers. According to Eurostats (2011) about a quarter the EU-27 population aged 16 to 74 years old have never used the Internet, the 55 to 74 old group only 40 % have at least once a week access to the Internet and for example in Germany the group of older users above 70 years, only 28.2 % use the Internet regularly (Initiative D21, 2012). The main reasons for this situation are lack of awareness about the potentials, as well as economic and technical barriers. Seniors lack the necessary eSkills; they fear the high technological requirements for the handling of standard devices to access the Internet and in some cases they are not aware of the chances the Internet can give to them. The advantages Internet access can provide for people have been largely documented and each of us can identify a large number of these, but for seniors the opportunities are even greater. In a study of White et al. (2002) new Internet users showed compared to a control group trends towards more autonomy, less loneliness and depression and a more positive attitude towards computers. The use of internet and e-mail also seems to have a positive effect on quality of life, mainly because of the new opportunities for social interactions (Schweiger & Ruppert, 2009). In this study the users rated their age as more positive and less harmful than non-users. This goes in line with activity theory, a well-known gerontology theory which states that active aging and the continuous involvement in meaningful activities has a positive impact on life satisfaction and aging (Neugarten, 1964). That this effect can be produced by teaching older adults how to use a computer is shown in the study of Shapira, Barak & Gal (2007). One group received computer and internet training and showed significant improvement in life satisfaction, depression, loneliness and self-control after four months compared to a control group. This effect might be even bigger when ICT can be used on more occasions.

The popularity of Tablet-PCs throughout Europe is increasing very fast. For the first time 2012 more Tablet-PCs were sold as standard PCs including notebooks (Spiegel, 2013). Price, mobility and usability issues are the main reasons for using a Tablet-PC. Tablet computer usage is growing very fast. For example in Germany, 13 % already have a Tablet-PC, in the

group of 60 years and older, 6 % use a Tablet-PC (Bitkom, 2012). These facts have motivated us to design a field study to identify the potentials of Tablet-PCs to support older people to engage with ICT and discover the joy of learning by using these inspiring devices for accessing the Internet and discovering the collective memory and knowledge on the Internet. The study we designed is aimed at discovering the potentials of Tablet-PCs for promoting the acquisition of eSkills amongst the older generation; for supporting the development of learning models and programs using tablet-PCs.

Research on the use of Tablet-PCs by seniors show some promising results sustaining the hypothesis that tablet-PCs can create a motivating opportunity for their first contact with the Internet (e.g. Werner et al. 2012; Digitale Chancen, 2012). The reasons are various. According to a usability study on the use of iPads by senior citizens by Werner et al. (ebd, p.184): "An essential advantage to conventional PCs proved to be the non-complex, less technical and less daunting look and easy handling of the device…. Additionally the touch screen interface and the lower amount of features enabled even Internet newcomers with low technical interest to use the device".

Tablet-PCs are very supportive to overcome initial motivational barriers, the intuitive user interface can be handled after a very short training time and the first successful tasks can be experienced in a very short time. Tablet-PCs can cope best with age-related impairments such as visual, auditive, sensory and motor impairments. E.g. seniors with diminishing senses and or those with hands, wrists, and fingers are twisted with arthritis can handle a Tablet. Seniors with visual impairments can simply expand the type to a size and make it easy to read. Tablets are a great opportunity to support seniors to access the Internet in a fast and personalized way. Unlike a desktop or even portable notebook computer, Tablet-PCs largely bypass the numbing computer learning curve. There's nothing to connect or plug in, its sensitive touch screen gives access to programs and features by touching prompts on the screen.

For these reasons it is essential to develop comprehensive Tablet-PC training dedicated to the very heterogeneous group of senior citizens, which are still off-line. In this sense, it is absolutely crucial to explore new innovative paths to support the older generations to actively take advantage and participate in the information, communication and social Internet world. The social and economic advantages are extremely high: supporting active aging and ICT competence development also means to give individuals to stay longer in an independent living situation and relieve some pressure on the social security systems across Europe. And; it also contributes enormously to feeding back knowledge and experiences of a life to society in general.

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MobiSen: Field Study on the Potentials of Tablet-PCs for eInclusion of Seniors

In the scope of the European Year for Active Aging and Solidarity between the generations the Innovation in Learning Institute at the University of Erlangen-Nuremberg in Germany had the opportunity to design and conduct a research study on the potential s of Tablet-PCs for involving the older generations in the knowledge and information society as a vehicle for promoting active aging and also the exchange across the generations. The MobiSen study was funded by the Federal Ministry for Families, Seniors, Women and Youth and took place in 2012.

The key research questions in our study are:

- Can Tablet-PCs motivate seniors to access the Internet and engage in the information and knowledge society?
- In comparison with standard PCs, which are the advantages of Tablet-PCs for motivation, Internet access and eLearning?

Study Design

In order to investigate the potentials of mobile tablet PCs two field research strategies were applied:

- **Pilot-Study:** During social and information events dedicated to the target group in 2012, seniors had the possibility to test a tablet PC. Aim of this study was to assess the motivational potentials for the older generation for accessing the Internet. Afterwards they were asked about their experiences. After a short introduction on the handling of tablet-PC (iPad3) seniors had the opportunity to choose one out of three possible exercises: (1) sending an e-mail, (2) Internet search and (3) download and reading of an iBook. Each exercise had duration of about 20 minutes. As support materials the participants watched first a 3-4 minutes video explaining how to perform the task, afterwards they head the opportunity to read on a website the information provided by the video and finally perform the exercise. After the exercise participants were interviewed about their experience.
- **Comparison Study:** To get a deeper insight in barriers and motivational aspects of tablet PCs also in comparison to standard PCs/Notebooks a second study with two matched groups was established. Both groups (iPad-group, Notebook-group) went through a course including four weekly sessions with duration of three hours. Participants learned basics about the use of the devices, the use of internet and different communication possibilities (E-Mail and Skype), which were also described in printed learning material. Additionally participants had access to an eLearning environment with learning material, exercises and a closed discussion forum supervised by a tutor and supported by telephone. Participants of both groups were selected and matched according sex, age and pre-experiences with ICT. Due to

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financial reasons (of the university and its funding through the Federal Ministry) and in order to get as many participants as possible, the university provided 15 Tablet-PCs and 7 notebooks to participants, all other participants brought their own device with. 18 participants per group took part in the investigation.

Participants

Participants of the Pilot-Study are at a mean 67.14 years old (range 50 to 85 years), there were two male and ten female participants. All of them had already experiences with PCs, two third of them had no experiences with Tablet-PCs or Smartphones.

Participants of the iPad-group in the comparison-study are at a mean 71.72 years old (range 65 to 80 years). Participants of the notebook-Group are at a mean 71.17 years old (range 63 to 79 years). Thirteen of the iPad and 6 persons of the notebook-group did not have any experiences with ICT before the training. All participants are already retired (see also Table 1).

Table 1: Socio-demographic data of study participants

Pilot-Study	**sex**		**Age**	**Use of ICT**
	female	**male**		
	10	2	M=67.14 years (range 50 to 80 years)	Yes: 12 No: 0
Comparison-study	**sex**		**Age**	**Use of ICT before MobiSen**
	female	**male**		
iPad-Group	10	8	M=71.72 years (range 65 to 85 years)	Yes: 5 No: 13
Notebook-Group	10	8	M=71.17 years (range 63 to 79 years	Yes: 12 No: 6

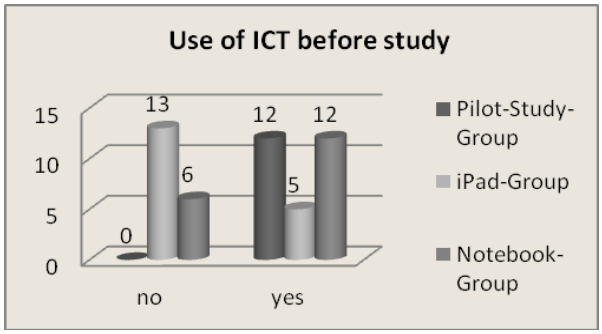

Figure 1. Participants' use of ICT before the study for pilot and the comparison study (n=48)

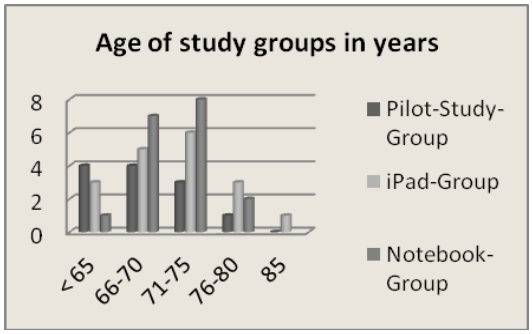

Figure 2. Participants' age for pilot and comparison study (n=48)

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Evaluation Instruments

Measures were taken by quantitative and qualitative analysis of pre-experiences, experiences during the exercise (pilot-study and comparison-study) and 6 month after course (comparison-study) using online (pilot-study) and paper-based (comparison-study) questionnaires with a five items Likert scale and interviews (comparison-study). Courses in the comparison-study were documented by video and participants were asked to describe their learning activities at home using a learning diary. Due to the small number of participants quantitative measures were analysed as descriptive dates. Qualitative analysis of given answers was done by clustering and counting equal answers to main topics in order to identify trends or general value of each device concerning difficulty in use, easiness of use, confidence of use and motivation. Analysis of video documentation focused on the observation of learning progress, difficulties and observed motivation during the session. Again observations were clustered and counted to detect trends.

Results of the Pilot Study

All participants of the pilot study (randomly chosen) stated to have previous experience with traditional devices like PCs or Notebooks, but two third did not have contact to any newer devices like tablet PCs or Smartphones (Figure 3). The participants were asked to report on their current ICT use in order to have a first impression on the main areas seniors are interested with. They appreciate especially the communication possibilities through the devices, followed by writing; digital photography and information seeking (further details Figure 4). The areas of use indicate that many of senior's requirements of ICT devices are easily met with tablet PCs.

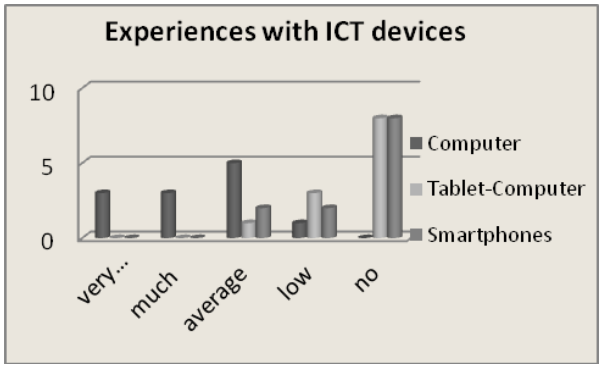

Figure 3. Experiences with ICT devices (n=12)

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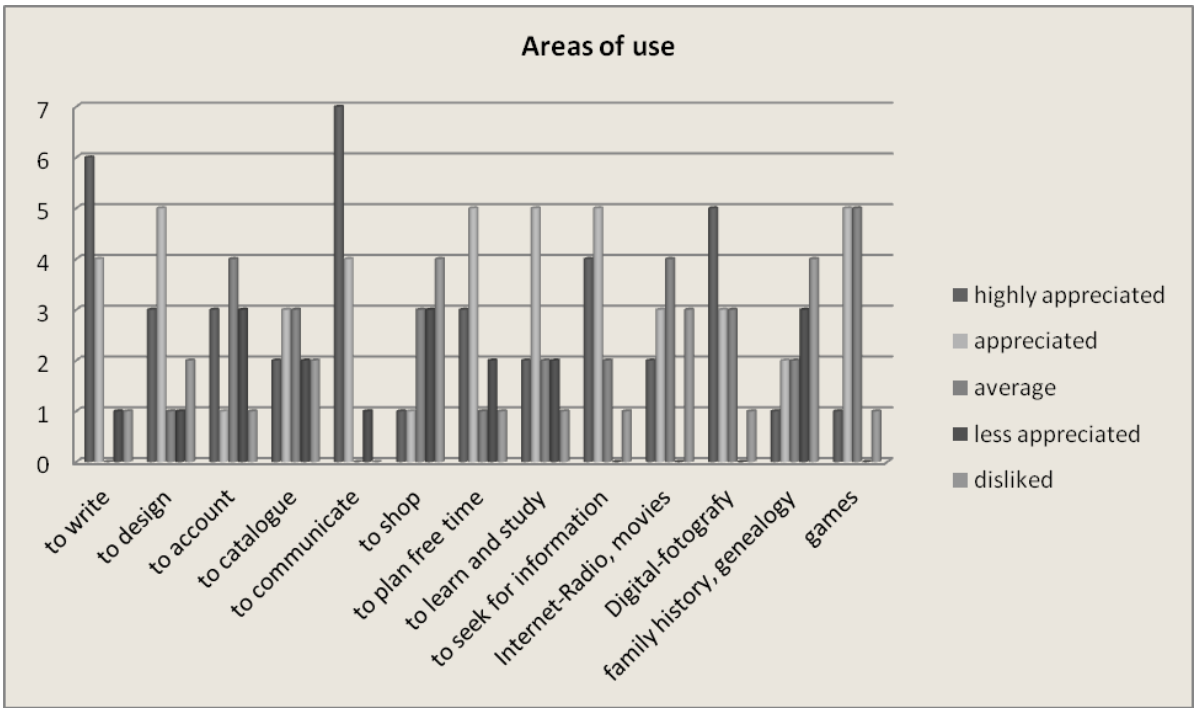

Figure 4. Areas of ICT use (n=12)

After the tablet-PC exercise participants were asked to assess user friendliness, joy of use, satisfaction, interest to learn more about tablet PCs and preferences in learning with a notebook or a tablet PC.

- User friendliness: five participants said it was very easy to handle, four assessed it as easy, two thought it was in parts easy and one person rated it as very difficult.
- Joy of use: six persons enjoy very much the use of the tablet very, 4 appreciated it and two appreciated it in parts.
- Satisfaction: five participants felt completely satisfied by the use of the tablet PC, three persons felt satisfied and again three persons felt in parts satisfied.
- After the first contact with a tablet seven users are very much (5) to much (2) interested in further use, two users are "in parts" interested, while only two users are less or not interested.
- Interest to learn more about tablet PCs: Six out of 11 wish definitely to learn further, two say no and two maybe
- Preferences in learning with a notebook or a tablet PC: They would rather prefer to further learn with a PC (6) and only 3 would like to learn with a Tablet-PC.

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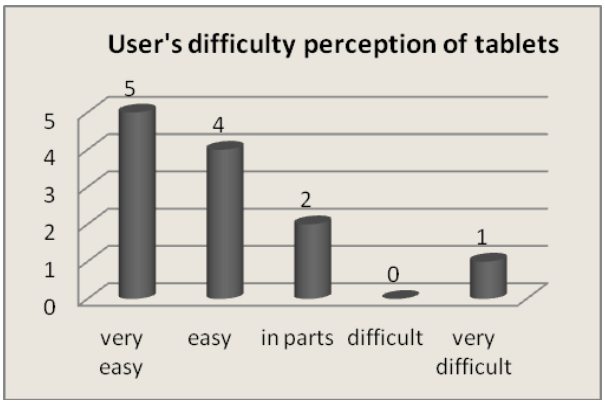

Figure 5. Assessment of the use's difficulty (n=12)

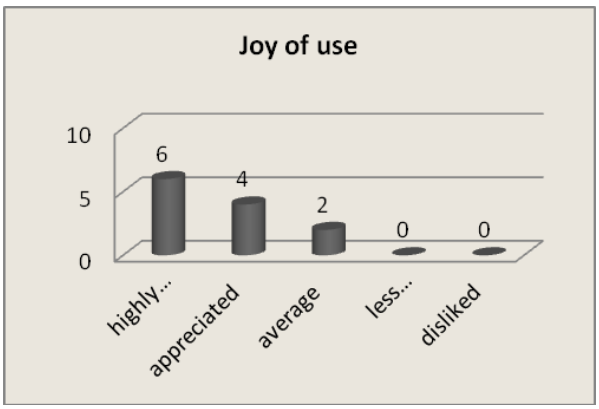

Figure 6. Assessment of the joy of use (n=12)

Figure 7. Satisfaction with the result of the exercise (n=11)

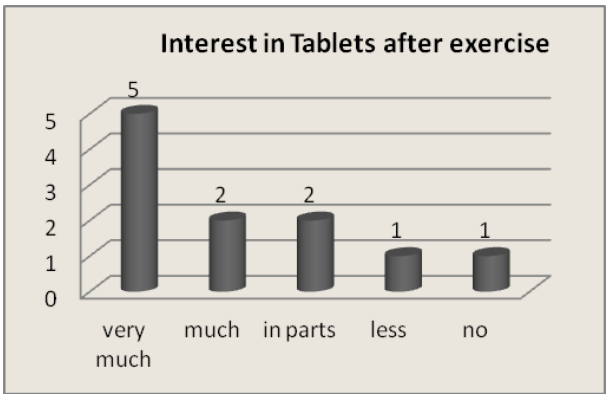

Figure 8. Interest in using a tablet-PC after the exercise (n=11)

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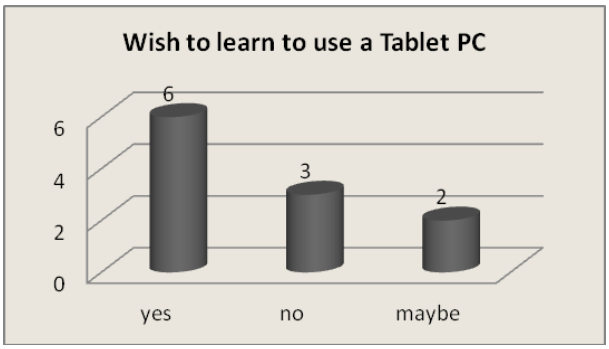

Figure 9. Interested in learning how to handle a tablet-PC (n=11)

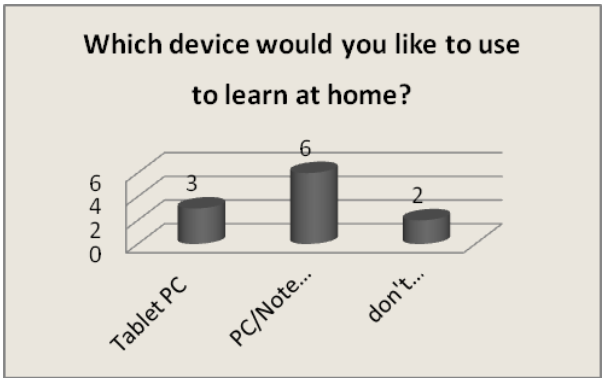

Figure 10. Use of Tablet at home (n=11)

Conclusions and indications after the Pilot study

The pilot study was source of inspiration and knowledge for the development of the comparison study. Out of the pilot it was clear that Tablet-PCs can be a very motivating and easy to use device for seniors to get online. In a very short time participants were able to conduct the pre-defined exercises to the end, they handled well the device and were motivated to further learn about and explore Tablet-PCs.

Results of the Comparison Study

The comparison study took place in July 2012. A group of two trainers and four assistants ran the courses. As above mentioned two equivalent learner groups were built. One user group used an iPad and the other use group a notebook (NB). The training was focused on supporting senior citizens to acquire eSkills for accessing the Internet, sending and receiving e-mails and use of Skype for Internet telephony. The focus was also on making the participants competent enough to handle also difficult aspects (e.g. W-LAN or UMTS connection) and make them able to setup an e-mail and Skype account. The focus was on developing competence.

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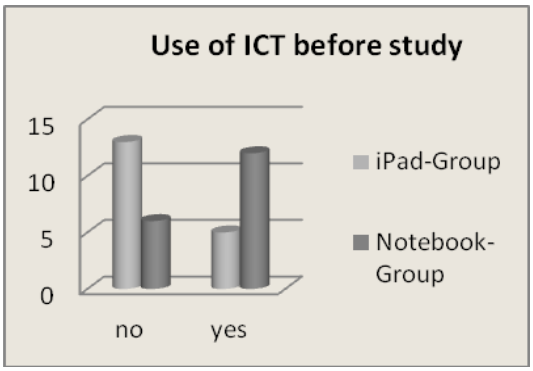

Figure 11. Use of ICT before the study by groups (n=36)

The level of pre-knowledge and familiarity with the device was much higher in the notebook-group as in the iPad group. 13 persons in the iPad-group did not have any ICT experience while in the Notebook-group 12 had already experience. Additionally the device was for all iPad participants new, while in the Notebook-group 11 participants were using their own and very familiar notebook.

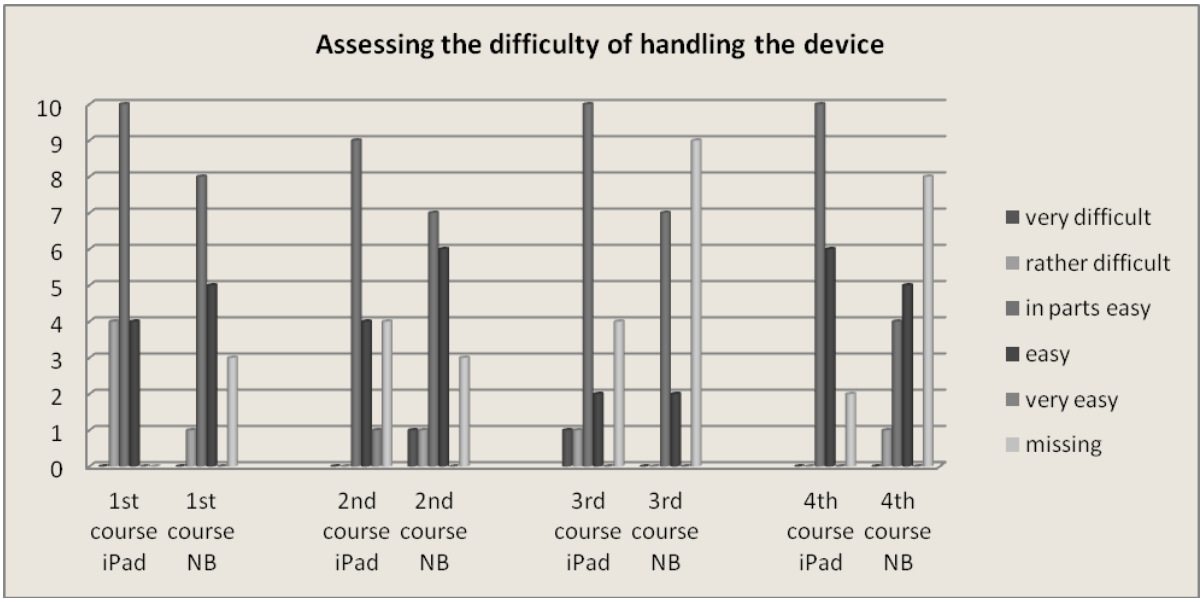

Figure 12. Participants reported on their difficulty perception. Group analysis (n=36)

In the progress of the course the iPad-group assessed the perception of the level of difficulty similar from the first to the last session with a trend to assess it as more easy at the end. At the beginning 10 persons assess the use of a tablet-PC as "easy in parts" also at the beginning and at the end of four training courses, but whereas four people thought it is "rather difficult" and four it is "easy" at the beginning of the courses, six persons assessed it as "easy" in the last session.

Within the Notebook-group it seems to be mentionable that there appear more silent drop outs in the time course. Participants took take place in the courses but were less willing to answer the questionnaires. There are still several persons who assess the use of the notebook as "easy" (5 to 6 persons), which might be due to the existing pre-knowledge of some participants of the notebook group. But there are fewer participants who assess it as "partly

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easy" at the end of the Study (four persons) and nearly 45 % of missing answers which might be interpreted as a sign of frustration.

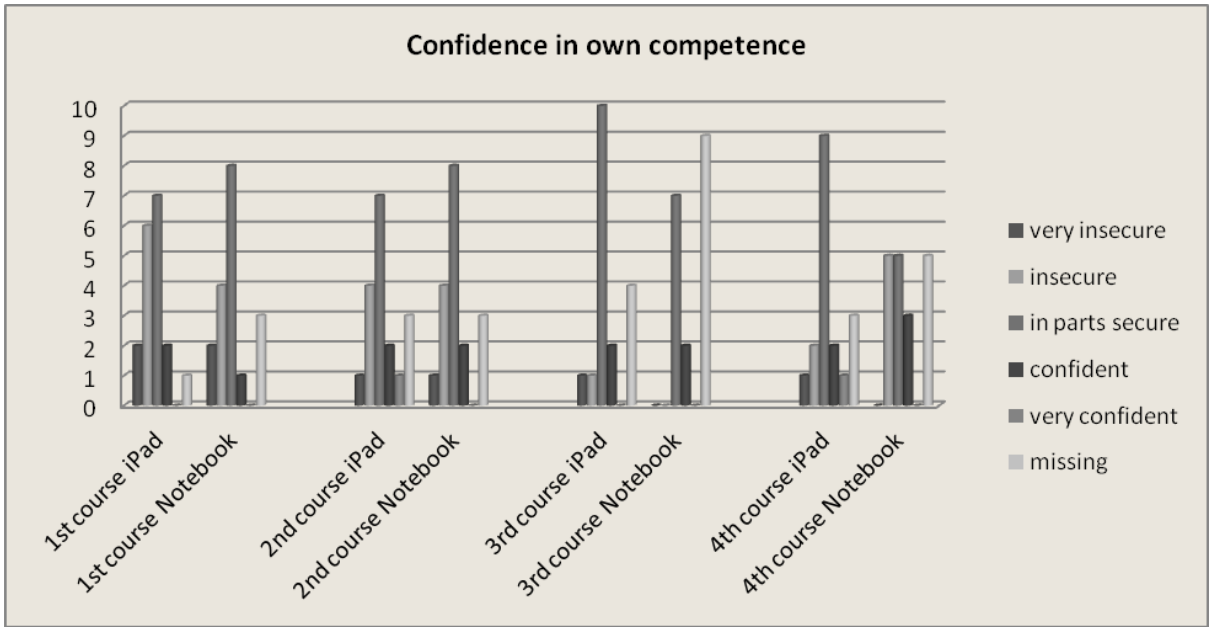

Figure 13. Evolution of the level of confidence in the own competence (handling the device and performing tasks) in the course of the 4 sessions. Analysis by group. (n=36)

Whereas during the first two courses the ratings in the both study-groups seem to be comparable. The iPad-group stated more often being "in parts secure" as "insecure" at the end of the training. In the course of the training the security in using the device increased for the iPad group. After the third course the ratings within the iPad-group staid stable and in some cases got better, while the ratings within the notebook-group declined. And again many notebook-group participants didn't provide an answer to the question.

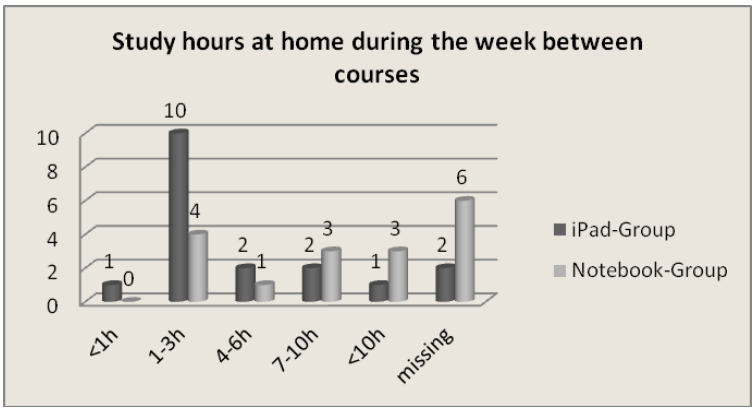

Figure 14. Number of learning hours between the training sessions. Analysis by group (n=36)

The level of competence at the end of the training was for both groups comparable although the number of learning hours per week between the training sessions was much lower for the iPad-group as for the notebook group. It seems that the notebook-group needed to exercise more in order to develop a reasonable level of eSkills.

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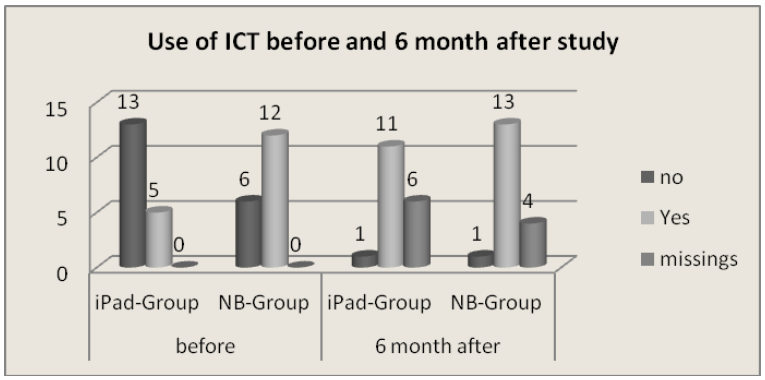

Figure 15. Use of ICT before and after the training. Group analysis (n=18)

Six months after the training the participants were contacted for a telephone interview in order to evaluate the sustainability of the motivation and eSkills. In the iPad 11 persons were using the ICT at a regular basis, 9 persons even bought a tablet-PC. This numbers sustain the statement that motivation and use after the training stayed at a high level. The notebook-group improved slightly, since the majority of the group had already some skills before starting the training.

In addition the analysis of the participants' answers of the open questions in the questionnaire allows the following conclusions:

- The iPad-group showed a greater motivation, which became obvious in some single comments and also in the amount and length of the comments in general.
- Nearly all participants of the iPad-group reported as beneficial the fast and simple access to a variety of information (e.g. maps, Wikipedia) on the internet.
- Also communication via E-mail was rated very positively by the iPad-group
- Furthermore for the iPad-group the portability and the possibility to easily take notes are rated very positively
- Participants in the iPad-group appreciated explicitly the touch-screen; they describe it as easy and user-friendly.
- Some members of the iPad-group found the device self-explanatory and easy to handle especially notable in the course of the time from the first to the last meeting.
- The course helped to overcome the inhibitions of most participants to access the Internet or use a computer in more often and in skilled way.

Discussion and Outlook

In general participants of the iPad-group reacted more frequently and more in detail than participants of the notebook group. Observation and video documentation also detects more silent drop outs of participants in the notebook group, also underlined by the high number of missing answers in the questionnaires. The joy of learning with a tablet-PC seems to be high.

The first indications regarding high level of satisfaction, motivation and rapid learning progress that could be identified during the pilot-study was confirmed by the comparison study afterwards. Despite the fact that the factors pre-knowledge, familiarity with the device

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and number of learning hours in-between the training sessions were much lower in the iPad-group, still the iPad-group managed to overcome the differences, develop the same or higher level of eSkills as the notebook group. At the end the iPad-group was higher motivated to proceed. These are indeed astonishing results that give a first indication on the potentials of tablet-PCs for the target group. The reasons are various:

- Simplicity: There are few things to care about in order to start using a tablet-PC
- Mobility: Easy portable and always ready to use due to low starting time.
- Easiness: With a relatively low level of eSkills users are able to perform high impact tasks such as taking a picture and sending it vie e-mail to relatives.
- Ap(p)titude: The app concept supports to accomplish tasks and it is more user friendly in general. The handling of an app is easier if compared with "all-integrated" programs in personal computers.
- The easy to understand and use touch screen approach is highly motivating, especially if compared with the mouse concept of standard computers.

We can conclude that Tablet-PCs have a huge potential for supporting less motivated and technique-related senior citizens to access the Internet and enjoy learning in later life.

This paper has presented the first outcomes of the MobiSen project. Further data analysis is taking place and will support the recognition of necessary features to be included while designing training for senior citizens for promoting their eInclusion and the use of Tablet-PCs for learning in later life.

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REIMAGINING AND REINVENTING DEMOCRACY THROUGH DIGITAL STORYTELLING – GLOBAL CITIZENSHIP EDUCATION IN THE "RIGHTS" PROJECT

Monica Fasciani, Università degli studi Guglielmo Marconi, Italy, Birte Hatlehol, The Norwegian Public Roads Administration, Terje Mølster, Hedmark University College, Norway

Abstract

This paper presents the objectives and first results of the RIGHTS project (pRomotIng Global citizensHip education Through digital Storytelling). The main aim of the RIGHTS project is to promote the Education for Global Citizenship (EGC) by enhancing interactive teaching in secondary schools in Europe through the use of Digital Storytelling (DS). Based on a research made by the partners, the project has developed an e-learning course for teachers in EGC. The main focus of the project and the course is to promote the teachers and students ability to *reimagine* and *reinvent democracy* through the implementation of an innovative didactic methodology by using digital storytelling as the main method in a global citizenship education.

The RIGHTS project is funded with support of the European Commission under the Lifelong Learning Programme – Sub-programme Comenius. Eight partners (schools, non-profit organisations, universities, cultural organisations) are involved in this project and they come from 7 different European countries Italy, Bulgaria, Spain, Portugal, Turkey, Switzerland and Norway[1]. The Italian university "Guglielmo Marconi" is the leading partner of the project.

The paper describes the educational, pedagogical, cultural and motivational benefits deriving from the applied methodology. The basic idea of the project is that allowing the students to have a voice and to actively participate in democracy both in school and in society, is a powerful way to support their development to become active citizens.

Introduction

Democracy is a fragile form of government, in the need of competent citizens that vote but not at least is engaged in politics. At least the last two decades there have been concerns about, and a focus on, the future of democracy not only in emerging democracies but also in the more established democracies. In addition we are facing great social and political changes, caused by globalisation, immigration and the implications of new media. For instance, new media has led to new patterns of participation in democracy. On the one hand there are

worries about the level of political participation and political understanding; on the other hand there are worries about the levels of apathy, ignorance and cynicism when it comes to public life, especially amongst the younger generation. It is claimed that the role of the people is being transformed from that of citizens, to that of consumers (Buckingham, 2000; Østerud, Selle & Engelstad, 2003).

Concerns about the future of the democracy have led to a worldwide interest in issues pertaining to education and citizenship, from the views of both the educational institutions as well as from the politicians. A key question is how to include young people into politics and how to create an education that supports their development to become active citizens. Citizenship is a pivotal concept nowadays and brings with itself rights, duties and multifaceted meanings: this importance was also stressed by the European Commission that selected the year 2013 as the European Year of Citizens. The Council of Europe indicates the primal goal of Democratic Citizenship Education as "not just equipping learners with knowledge, understanding and skills, but also empowering them with the readiness to take action in society in the defence and promotion of human rights, democracy and the rule of law" (GDV/EDU/CIT 2003).

However, despite this, most of the civic/citizenship education still has to be characterised as voter education in the sense that we socialise our students into voting in particular. In Europe there is a great variety of civic/citizenship education but much of this education is *about* political systems, *about* democracy, *about* formalities and above all *about* voting (Solhaug, 2012). It could be claimed that the education may be characterised by socialising the students into the current political order. There is a need of new thoughts and methods when it comes to civic/citizenship education.

The innovative project RIGHTS "pRomotIng Global citizensHip education Through digital Storytelling, tries to echo the Millennium Development Goals objectives. But first and foremost the project promotes the teachers and students ability to *reimagine* and *reinvent democracy* through the implementation of an innovative didactic methodology by using digital storytelling as the main method in a global citizenship education.

RIGHTS is a two-year Comenius project co-funded by the EU Lifelong Learning Program which started in October 2011 and will finish in September 2013. Global Citizenship Education, which includes and deepens Sustainable Education and Development Education, inter alia, is meant to be a comprehensive approach to the different challenges of the present globalized world, with an emphasis on individual and social responsibility and consequent capacity of action. New generations should become innovative agents of change and social transformation! Therefore we are in need of teachers who are able to promote an active global citizenship.

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Based on a research made by the partners, there has been produced *an e-learning course for teachers*, focusing on Education for Global Citizenship issues and digital storytelling techniques. The project's specific target groups are secondary school teachers and students in the seven partner countries involved in the initiative: Italy, Bulgaria, Spain, Portugal, Turkey, Switzerland and Norway. The main objective of the project is to implement an innovative didactic methodology that can help promote the Education for Global Citizenship (EGC) through the use of Digital Storytelling (DS), by enhancing interactive teaching and learning across countries and cultures in secondary schools in Europe. The innovative aspect of the RIGHTS didactic methodology is both related to the use of the digital storytelling approach, and to the contents related to Global citizenship education issues. The RIGHTS project aims at implementing and testing this methodology since it can support:

- promoting Global Citizenship Education in the EU secondary schools curriculum;
- delivering innovative ICT- based approaches to enhance teaching and learning thus fostering initiative, innovation and creativity;
- allowing teachers and students to acquire new skills through the production of Digital Stories;
- empowering students and stimulating their creativity and critical thinking.

Global citizenship education

Citizenship has two dimensions; a political dimension and a participating dimension. Being a citizen is about having the opportunity to actively participate in society, and about being influential in political processes. The citizenship perspective is useful because it recognizes the fact that not only will young people be citizens in the future, they are also important members of society – citizens – in their youth. The political dimension of citizenship, demands a wide understanding of politics. Politics include traditional political activities but more important in this context are diverse activities that have political or social agendas or consequences (NOU 2011). In the traditional way of understanding education and citizenship - citizenship is often conceived as outcome, and this places young people in the problematic position of not-yet-being-a-citizen (Biesta & Lawy, 2006). Young people are often seen as 'citizens in the making'.

Several definitions of Global Education or Educations for Democratic Citizenship can be found at a European level, while Global Citizenship Education (GCE) is a relatively new term, which still cannot be found in European regulations or official documents.

- As highlighted in the RIGHTS project research phase, Global Citizenship Education does not have an official definition. It is a practice, which has been developed in Europe, and in several non-European countries starting from the need to grapple with some common challenges. These include the changing international social and political situation, the globalization of the economy, information and transportation, the increase in migratory flows to richer countries, which has brought about the

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growth of an increasingly multi-cultural society, the economic crises, and the problems linked to climate change, to name only a few.

- At the European institutional level the North-South Centre[2], provides this definition of Global Education: "Global education is understood to encompass Development Education, Human Rights Education, Education for Sustainability, Education for Peace and Conflict Prevention and Intercultural Education; being the global dimension of Education for Citizenship", therefore it provides knowledge about universal concepts of humanity and about communalities and different lifestyles, cultures, religions and generations.
- Educating for global citizenship has become a shared goal of educators and educational institutions interested in expanding their own and their students' understanding of what it means to claim or to have citizenship in the twenty-first century. A strong message in this direction was given by the UN Secretary General, who launched the Education First campaign in September 2012: one of the priorities of this campaign is promoting global citizenship. Global education is intertwined with the contemporary movements that push for curriculum innovation in different countries that encourage a more flexible and open perspective by applying new content and using active methods and new resources.
- Global education is not just concerned with different perspectives on globalised themes and what you teach and learn about them. It is also concerned about how you teach and learn and the contextual conditions in which you teach and learn. In fact there is a necessary unity between the content, form and context in which the learning process takes place[3]. In a global education learning process students and educators go deeper into the roots and causes of events and developments and share ideas on possible solutions in a dynamic exercise of observation, analysis, reflection and exchange of information that creates a new circle of knowledge and interests. The content is therefore a result of a constant interrelation between abstract knowledge of theory and concrete experience of everyday life. According to Solhaug (2012), there is an international trend in teaching and research in the social sciences; the criticism of the formal facts and knowledge orientation. This orientation is partly irrelevant and the effect on the student engagement and participation is debatable.
- Solhaug asserts that school has some options in civic learning; they could turn their focus towards the current political problems, the current conflicts in their countries and try to encourage students in their political participation. School should become cleverer in becoming an arena for dialog and discussion between the students. This is particularly important in democracy, and also a way for students to learn to make themselves political effective (Solhaug, 2006). The global citizenship education should increase the student's knowledge about the possibilities they have to influence society, and to enable them to participate and influence political processes both through media and through "real-life" participation.

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Biesta and Lavvy (2006) argue that there needs to be a shift from teaching citizenship to learning democracy. The key question is how do young people actually learn democratic citizenship and how can teachers develop this? According to Biesta and Lavvy democracy is not confined to the sphere of political decision-making but extends to participation in the 'construction, maintenance and transformation' of all forms of social and political life. The focus on learning democracy allows us to show the ways in which this learning is situated in the unfolding lives of young people. It also allows us to make clear how these lives are involved in a wider cultural, social, political and economic order. It is ultimately this wider context that provides opportunities for young people to be and to become democratic citizens and to learn democratic citizenship. In other words – citizenship as a practice.

In this context we can see the pivotal role of Digital storytelling, which is an important media tool for involving people. It belongs to media education that is directly related to global education. In global education an educator using the media may encourage learners to become aware of global problems, to be a critical audience for any form of given information, to deconstruct stereotypes, to develop a culture of understanding and to be active citizens. Learners using the media in a global education learning process can be active researchers of information and collaborative participants in a process towards discovering knowledge. Using the media is a challenging way not only of getting, but also of spreading information from the group to the local or global community, if the group goes on from the learning activity to action in the real life or in cyber space. The spread of social media is described as a new infrastructure for participation and mobilization, which promotes adolescent's power and influence. There is an increased importance of digital citizenship of youth. Therefore it has become more important than before to promote the development of the student's "voices". Biesta and Lawy (2006) emphasizes the importance of teaching children and adolescents to speak with their own voice, so that they can break into the world and respond, and thereby be constituted as responsible subjects. Digital storytelling promotes development of the student's voices and has the potential to enhance the student's as active citizens.

Learning democracy is about letting the children and adolescents experience democracy, and through the experiences learn and understand how to navigate in a democracy and thorough that also grasp the notion of the common good like hospitals, libraries, music schools etc. This is a precondition to understand the notion of democracy and consequently to be an active citizen.

If learning democracy is situated in the lives of young people, then citizenship education should also facilitate a critical examination of the actual conditions of young people's citizenship. David Buckingham's research (2000, 2003) shows that young people are mostly alienated, or at least disconnected, from traditional forms of politics and civic participation. Children's' and adolescent's voices are often not heard. They have achieved status as consumers, but to a very limited degree status as citizens. This means that we have to include children and adolescents in the democracy. With other words; there is a need to democratize democracy!

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Educational uses of digital storytelling

The use of digital tools can give alternatives to traditional education and offer the chance to use different communication codes at the same time (Tavangarian, Leypold, Nölting & Röser 2004). ICT have great potential for an effective learning and for the implementation of more successful teaching approaches. Despite rapid advance in today's technology, many educational institutions in Europe are not experimenting with digital tools in a creative or innovative way. As reported in the OECD survey (OECD 2009), almost all EU countries report shortfalls in teaching skills and difficulties in updating them. Shortages relates to the lack of competence to deal with new developments in Education especially in preparing learners to make the most of ICT.

Digital Storytelling is the practice of using digital technologies to tell a short story (Robin 2008). The rights project focused on the use of DS, as it has proven to be a powerful and effective learning tool in stimulating creativity and critical thinking through the combination of the ancient art of telling stories with different digital tools. Over the last fifteen years DS has been applied to many different contexts and has encountered a wide range of possibilities. According to the CDS – Center for Digital Storytelling (Lambert, 2003), a digital story is a short, first person video-narrative created by combining recorded voice, still and moving images, and music or other sounds. CDS experience has largely demonstrated that the project-based learning within the context of personal narrative greatly accelerates the learning process of multimedia technologies. Such projects not only reinforce writing and research skills, but help students to work together, critique one another's work through discussion and help students gain 21st century literacy skills by utilizing today's latest technologies. In doing so, educators are not only engaging their students on multiple levels, but also preparing them with the skills for the world beyond their secondary school education. By teaching to apply the digital techniques to standard writing techniques such as narrative and screenplay, Digital storytelling allows both teachers and students to approach different subjects in a creative and interactive way and at the same time to develop different transversal competences for lifelong learning such as digital competences, social and civic competences and cultural awareness and expression.

The RIGHTS project

As mentioned above the RIGHTS project wants to promote the Education for Global Citizenship (EGC) by enhancing interactive teaching in secondary schools in Europe through the use of Digital Storytelling (DS). EGC is a comprehensive approach to the challenges of the present globalized world, with an emphasis on individual and social responsibility and consequent capacity of action. It points out to the empowering of the individual, not only to the transmission of notions.

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RIGHTS will allow both teachers and students to approach EGC in a creative and interactive way, and at the same time to develop transversal key competences: civic competences and cultural awareness thanks to the topic treated i.e. EGC; digital competences thanks to the use of multimedia materials and tools. RIGHTS didactic methodology will be firstly tested through the delivery of an online training course to teachers, and secondly through the organization of workshops with students and teachers. They will be supported by facilitators in producing their personal digital stories.

The main project results are:

1. E-learning course for teachers, focussing on EGC issues and digital storytelling techniques.
2. The digital stories on Global Citizenship Education.

The research

The RIGHTS consortium carried out a research activity with the aim to compare the experiences/expectations of seven European partner countries around Digital Storytelling (DS) and Global Citizenship Education (GCE). The idea was to help to map out the main methods guiding GCE in the 7 countries involved, with a focus on the activities of those schools attended by 12 to 16 year-old students. The main research activities were:

- analysis of the national documentation on the subject and definition of key concepts on the topic of citizenship;
- European Union regulations;
- Facebook page experiment;
- interviews with secondary school teachers.

The research produced by the Rights project's partners delineates a highly varied portrait of the concepts, practices and objectives attributed to GCE. The overall picture of the standards and specific educational contexts of the seven countries covered presented some similarities. First, in none of the countries there is a specific teaching called "Global Citizenship Education". However, all the countries provide for one or more variously named types of teaching which refer to teaching about citizenship and human rights. Furthermore, it was noticed the amount of systems that, in defining the objectives and contents of the teaching, make clear the need to give it a "global" scope.

According to the researchers' analysis, the use of the DST method is still in its initial stages. Although in a couple of the involved countries some projects, entirely revolving around DST as the core of students and teachers' educational activities are allegedly being carried out, in other countries DST is mainly used in a synergy with other, more traditional educational and teaching activities. More precisely, DST is part of an education scheme, a useful tool in the introduction and/or final stages of workshops or learning activities actually based on other techniques and tools. In these contexts, DST is used as an instrument for fixing and preserving

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an education project on a digital support. It is, however, broadly acknowledged that the huge potential of DST should be developed in several and diverse educational contexts and according to different perspectives, due to its strong impact on adolescents, youth, and, last but not least, children, who were actually born in a highly technological social context.

The e-course

The RIGHTS consortium designed an e-course addressed to high school teachers and focused on Global Citizenship Education and the use of Digital Storytelling as learning tool in secondary schools of the partners involved. The course requires participants to be active at least a total of 30 hours on theoretical and practical aspects during a 3 months period. It also includes the development of digital stories produced by their students.

The RIGHTS E-course will be based on approximately 150 pages of educational material comprising a diversity of interactive individual and group activities with coached assignments, a virtual library and a glossary. It is structured in a total of 7 sequential including a set of initial modules introducing the course and Global Citizenship Education, followed by modules focusing the competences needed to address GCE in active ways and ending with the production of a Digital Story on the issues of Democracy and Citizenship.

The RIGHTS E-course appeals to the intrinsic motivation of secondary school teachers and students to learn, to do a better job, and to enjoy doing it. The web-based learning environment is designed to be as interactive as possible, taking into account that interactivity is not simply clicking on buttons, watching animations or video, or listening to sound clips. Frequent learning checks and appropriate and timely feedback by tutors are important motivational elements.

The Experimentation

In order to effectively test and assess the project's didactic methodology the project consortium is carrying out an Experimentation action, in the secondary schools of all the seven partner countries. The Experimentation is split in two main parts: the first part is the e-learning course and around 10 teachers in each country were selected to partake in it. The second part is a practical session: upon completion of the modules of the online course teachers will take the newly acquired skills and knowledge into their classroom. As part of their training, teachers will coordinate the production of digital stories on GCE related topics in one of their classes. To this end they will organise some workshops (24 hours) involving students. Students will be introduced to all aspects of GCE and of digital storytelling from script writing, narrative techniques, voice recording, images, acquiring transversal skills (such as writing and verbal skills, technical skills, creativity, critical thinking, teambuilding etc.).

Some of the results of the experimentation will be presented during the EDEN conference.

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Conclusion

In conclusion RIGHTS project wants to embrace the best of the new possibilities offered by modern multimedia tools as a support to education in order to break down the barriers between formal and informal education. The DS technique can facilitate the process of awareness raising, through practical experience, of the issues related to Global Citizenship Education. The pedagogical model provides the students with inputs and tools: the students are then called to be actively engaged giving voice to their own perceptions and feelings about the chosen topic. In doing so they have to work together, respect each other and allow space for others.

The current global situation requires new ways of thinking and the key competences needed in the future have to reflect more than before, flexibility, risk-taking, creativity and innovation. This is a challenge for formal education in general and lifelong learning in particular.

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[1] The Italian university "Guglielmo Marconi", the Italian NGO C.I.E.S (Centro Informazione e Educazione allo Sviluppo onlus), the Bulgarian Gender Research Foundation (BGRF), the Portuguese NGO APS (Associação de Professores de Sintra), the Istanbul Provincial Directorate of National Education (ILMEM), the Norwegian University College of Hedmark (HUC), SEED association from Switzerland and TRÀNSIT Projectes from Spain.
[2] North-South Center, officially named the European Centre for Global Interdependence and Solidarity, is a Partial Agreement of the Council of Europe whose mandate is to provide a framework for European co-operation designed to heighten public awareness of global interdependence issues and to promote policies of solidarity complying with the Council of Europe's aims and principles, respect for human rights, democracy and social cohesion.
[3] See the aims of global education in "Global Education Guidelines – a handbook for educators to understand and implement global education-, North-South Centre of the Council of Europe, Lisbon, update version 2010, pp. 18, and 19.

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EDUCATIONAL ROBOTICS AND SOCIAL INCLUSION

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Introduction

During the past few years, new technologies based on the use of artificial environments and technological artifacts (educational simulations, microworlds, robots) that radically changed the traditional methods of education and that promise to change them even more, have been developed. The design of these tools was inspired by Piaget's theory of cognitive development, later revised by Papert (Strollo, 2008). In particular, technological artifacts that are becoming increasingly popular and affordable in school contexts are robots.

Nowadays, robotic applications affect different areas of our life and are gaining increasing importance in the scientific, economic and cultural field. Despite that, there is still a lack of disclosure of robotics, also due to the fact that it is a young science, while the literature and science fiction films have anticipated the scientific work itself (Caracciolo et al., 2009). Europe is trying to rise in the robotics field, even if it remains in a secondary position compared to other countries like the U.S. and Japan, countries that are heavily investing in this field, not only in economic terms (Caracciolo, op.cit.). This means that to bridge the gap a great creativity is needed, to create training and dissemination activities that involve social, cultural and economic sectors, to attract and direct resources to motivate the new generations. This is the reason why, during the last few years, many countries are trying to use robots in education, with the belief that making children aware of developments in robotics is increasingly important for citizens' training and in maintaining commitment to lifelong education.

In any case, robots are nothing new in education, they are an evolution of LOGO (Calabretta, 2010), a language based on turtle's movements in a virtual microworlds, developed by the children themselves with a computer. The main difference lies in the fact that the microworlds are virtual reality, whereas with robotics is possible to create and move small robots in a real space. This is the reason why robots can have an important impact on education, in particular on curricula, in organizing and managing the educational environment, representing a useful tool to stimulate learning motivation.

This article focuses on the impact of these applications in educational world, paving the way for the birth of a new field of research called Educational Robotics. It aims to highlight how the scholastic integration of disabled children can be improved through the introduction of

interactive robotics. Through an experiment, has been verified as robots and computer can be combined as a very useful tool to improve social and educational inclusion, enriching and stimulating the teaching and learning activities, optimizing teachers' pedagogical practices.

Educational robotics: a methodology to negotiate different points of view

There is not a universally concerted definition of educational robotics. Some authors underline the use of robots as a tool of learning, in particular in scientific fields (Calabretta, 2010; Caci et al., 2002; Jormanainen, 2006[1]), whereas others authors underline the multidisciplinary aspects that characterize this research field (Garbati, 2012; Strollo, 2008). Generally speaking, it is a common understanding that educational robotics is a methodology that foresees the use of robots in learning activity, combining innovation, education and inclusion, involving students of different age (Micheli & Urschitz, 2011).

As above mentioned, the educational framework of educational robotics refers to the learning theory developed by Seymour Papert, i.e. constructionism (Papert, 1984). This theory is based, in turn, to Jean Piaget's constructivism, according to which the process of understanding the world is constructed into the relation that is established between an active subject and the objects of his/her experience (Mooney, 2000). Papert enriches the constructivist perspective emphasizing the need to move the knowledge acquisition process toward the practice, underlining how the effectiveness of the knowledge construction process finds its highest expression in the production of concrete products and materials. This is also supported by Jonassen, who points out how

> *"learning is activity-based, not content-based. Learning is situated in the problems they are solving, so the learning issues are emergent from those problems. Those issues cannot be predicted or prescribed in any curriculum. Learning are solving problems in the real world rely on the knowledge distributed throughout a community of practice" (Jonassen, 2002, p.2)*

From this point of view robots offer the possibility of learning experiences where learning and practice are closely linked to each other, where unexpected situations often arise, challenging both teachers as students, in a perspective where education is seen as research (Malaguzzi, 1995; Resnick, 2002), i.e. a path made of many doubts, in which no one can say to have discovered the definitive method. In addition to this, educational robotics offers the possibility to create several interdisciplinary connections (Resnick et al., 1998), encouraging creative problem solving and cooperative work, providing an environment where students can experiment in group different solutions to the problems proposed, coordinated by the teacher. As highlighted in the "Educational Robotics against social isolation" project[2], the robots are mates of playing and training, that help "Learning by doing and involving" (Digital World Foundation, 2012).

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From this point of view, robots offer students and teachers a method through which to learn to negotiate their own point of view with the others, taking into account many differences in opinions. In this way, the learning path offered by educational robotics is not the result of an individual, but is rather the result of a set of processes of social interactions that take place while collaborating in groups, thereby creating more positive attitudes towards learning, paying more attention to emotional and social aspects of learning and moving to a competence-based approach that enhances learners as well as their prior experiences (European Commission, 2008). In particular, through educational methods that make use of robots, it is possible to develop key competences in science and technology, as well as social and civic competences, which all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment.

Robots and school integration

In Italy, the process of school integration has been ongoing for many years, but proceeds slowly, because it requires changes and adjustment in teachers' attitudes, teaching methods and practices, as well as changes in the materials and equipment used.

The increasing number of children who need special education, (students with physical deficiencies, cognitive, emotional and social impairments), in short, requires an increasing amount of resources from teachers and a rethinking of educational resources. In this ongoing and challenging situation, educational technology (assistive technologies, communication technologies, and learning software) has been one important element facilitating integration. As pointed out by many researches (Kärnä-Lin et al., 2006; Sutinen et al., 2005), the introduction of robotics in special education, has been promising for addressing these special needs.

Two main concepts are the basis of educational robotics: "Edutainment" (Educate playing), and "Learner centred" (learner-centred learning). For this reasons robots are a powerful tool, since it is possible to create fun activities in which students are the protagonists, and that helps to support students' motivation. However, working with robots is not just a game; to carry out the proposed activities it is necessary to invest in attention, collaboration, organizational capacity and build on more specific skills related to the tasks to be performed. It is the path that is done to achieve a specific goal that gives educational value to the activity, not just to build a robot or to program it.

Educational robotics not only provides a learning environment rich of problem solving situations, but it requires students to work in groups. It is often the discussion among peers, in small groups, that allows reaching the problems' solution encountered during the activity (Merlo, 2010). In this context the teacher has to help students to gather ideas, rework or organize them in a coherent way to achieve their goals, without replace their thought with its. Hence, robotics can become a way to break with the traditional teaching, since it allows discovering new ways for organizing the relationship between teachers, students and knowledge (Nappi, 2010).

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Therefore, teachers, with robots, have a tool that allows active learning, in constructivist-style, in which learning is stimulated and motivated by "doing" as opposed to the immateriality of computer software, that represents a valid support to study both scientific and humanistic subjects.

Furthermore, robots represent an important tool to facilitate the integration of pupils with special educational needs (Mattioli, 2012). "Disabled" pupils, but also students with learning difficulties, can get substantial benefit from educational robotics activities, since they foreseen the involvement of different "intelligences", that every student has: it is not privileged linguistic intelligence or memory, to carry out the activities it is necessary "emotional", "motor-praxis", "musical" intelligence (Rocco, 2012). Working in heterogeneous groups, each student should engage his/her competences, trying to improve them, sustained by the skills of other classmates: it is the group that, at the end, obtains that result (often students know how to "teach" to their peers more effectively than teachers). The disabled student must be evaluated for his/her potentials: if s/he meets difficulties in programming and using software, s/he can be a leader in robot assembly, to start it, or to drive the robot during its movements (Rocco, op.cit.).

Following these ideas, an experiment to investigate whether and how educational robotics can increase social inclusion in secondary schools was put into place, taking account of the way educational robotics can change the learning experiences of users to make them more inclusive, involving different students in the process, and encompassing cultural heritage and learning style. Most talented students and those with learning difficulties were involved in the design, construction and programming of small robots, working as a team, pooling their talents and their different intelligences, in a way that recognizes the fact that the intelligence of the others is the first step to a full integration of foreigners and students with special needs (Micheli & Urschitz, op.cit.).

Develop key competencies and social inclusion: an experiment

The activities proposed into the experiment aimed to sustain a process of integration and social inclusion into a secondary school class, without excluding students with special needs. For this reason, special attention was paid to the organizational and methodological aspects, trying to use not only the robot technology, but different strategies to improve the integration and therefore the involvement of disabled pupils in the robotics activity, conducted in laboratory, both in small group and individually.

Method and sample group

The experiment involved a class of secondary school, primary level (12-13 years old), in different activities, using LEGO Mindstorms NXT Robots. The class consists of 20 students, 6 females and 13 males, two of whom are foreigners and two with special needs (a pupil hyperactive and a student with cognitive delay).

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"What is a robot", "how it can be represented" and "how we can tell it" were the starting points of this work, composed of different activities that involved students for 5 hours spread over different days.

Through a drawing or a short story, the students had to tell what a robot was for them. Each student was able to express themselves freely, trying to represent their thoughts, their prior knowledge, through words or painting, and using their imagination. After that, it was important to show to the whole class the results of this activity, discussing with pupils their productions.

Before starting the task with robots, videos representing various fields of robotics application were showed to the class; videos that drew the pupils' attention and their curiosity, as well as showed the dissemination of this technology, often unaware from the students, who still see it as a pure science fiction.

Then, the class was divided into groups, each of which, using a maximum number of pieces made available by teachers, was required to construct a component for a LEGO Mindstorms NXT robot. In addition to this, each group was divided into two subgroups, one of which had to describe the component realized, while the other to program the component itself, through the software NXT-G of LEGO Mindstorms (in this phase was importance to emphasize collaboration and shared responsibility). This activity was concluded with the work sharing, stressing the importance of dividing big tasks and to be able to collaborate, in order to reach goals that alone would be difficult to achieve.

The possibility to realize learning environments divided by small groups had the fundamental prerogative to constitute a model of dynamic learning, able to allow the pupils with special needs to develop their potential, as well as the plasticity of their identity, reaching objectives and activities containing the seeds of social inclusion, as a prelude to their autonomy. One member of the group assumed the role of mentor, encouraging his partner, giving him information or an explanation of the task, suggesting strategies, helping to reason together, being attentive to his difficulty, reading nonverbal behaviour, being able to see his difficulties.

Objectives

The activities described above aimed at developing not only basic competences in science and technology, but also competences in linguistic, artistic and expressive field as well as social and civic competences.

With reference to the "Key competences for lifelong learning – European Reference Framework" (European Commission, 2006), the main competences that the activities try to develop are:

- Basic competences in science and technology,
- Social competences,
- Civic competences.

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The pupils have to listen and talk with peers when they work in small groups, when, after building their component for NXT robot, they have to explain inside their groups how put together all the pieces of their component and how to program it; finally, they have to explain to the whole class what they did.

The discussion around issues concerning building robots, how particular components work and how program them, stimulates the production of conjectures and arguments. These skills are also important in mathematics and it is possible to strengthen them only in contexts in which students have to solve real problems, to take up challenges and resolve cognitive conflicts. Robotics offers a lot of situations like that (Merlo, op.cit.).

Hence, as it is possible to guess, the class discussion is the strength of the proposed activities: to overcome difficulties and solve problems the students have to explicit their ideas and share their knowledge. In addition to this, it is important that the construction activity is placed side by side written productions (Merlo, op.cit.). The students' productions during the different activity phases are important documents, because in drawings and texts students express meaningful ideas and thoughts, connected with their experience. The invention of "robotic" stories, drawings of imaginary robots, building robots with LEGO, show a great invention capacity, that should be exploited and encouraged.

Results

The analysis of the test and post-test showed that the students have gained a new sense of: leadership, collaboration, involvement, sharing, reciprocity, creativity, negotiation, constructive and proactive participation.

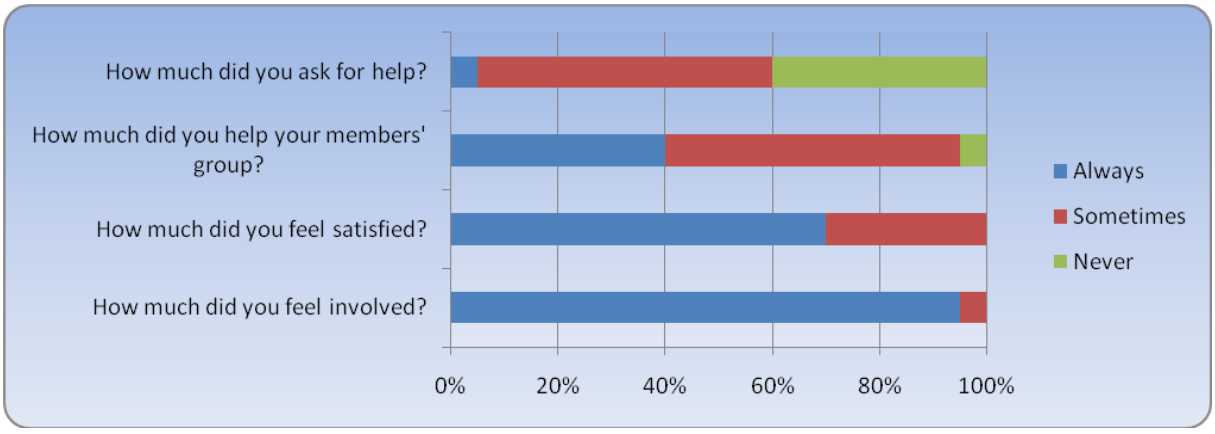

Figure 1. Proactive involvement and satisfaction index

Concerning competences that the activities tried to develop, they can be identified as follows

- Basic competences in science and technology
  - The ability to use and handle technological tools and machines to achieve a goal

    "I learned how to build and program (9 students) – what is a robot (12 students) – what can be used to create one (10 students)" – "I learned that creativity does not need of great things, just of a little/great idea" (Tatiana).

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– The ability to communicate the conclusions and reasoning that led a scientific inquiry;

"I appreciated the explanations of the group's members and the exchange of data to reach the conclusion of the work" (Samuel).

– Critical appreciation and curiosity

"I discovered new and interesting things" (Elena) – "I discovered things I never imagined even existed" (Tatiana).

- Social competences
  – The ability to communicate constructively in different environments

  "I learned to work in groups" (9 students)

  – Show tolerance – express and understand different viewpoints

  "We exchanged ideas and points of view" (Julia) – "I loved our sharing of ideas" (Julia), "Among a group, you can get more ideas; the work can be better realized" (Simone).

  – The ability to create confidence, and to feel empathy;

  "We tried to learn having fun and feeling a group" (Tommaso) – "Although there have been some difficulties, I did not get down and I lifted the mood of the group" (Samuel) – "I had fun and I felt in tune to work in group" (Simone) – "Every decision was taken by the group, because we felt very much in tune" (Muslum).

  – Attitude of collaboration, assertiveness and integrity

  "I loved that we all worked together" (Julia) – "I could build something with a friend of mine" (Muslum) (Christian) – "Even though I was not entirely agree with the decisions of the group, I participated collaboratively" (Elena) – "The collaboration has been useful for the significant contribution of all ideas" (Sofia) – "While everyone was led to rely only on his own, the choices were the result of collaboration" (Tatiana) – "All took part in decisions, in order to work in accordance" (Simone) - "We could compare our ideas" (Oliver).

  – Value diversity and respect others, and be prepared both to overcome prejudices and to compromise.

  "Each of us has different points of view, but knows how to respect each other" (Julia) –"We always decided as a group, exchanging ideas and opinions, so that everyone could express their idea" (Julia) – "I appreciated the work of the group, because we were able to overcome the diversity of points of view" (Evan) – "I enjoyed the group work, because we could have different ideas and more creativity" (Christopher) – "Even though I was not entirely agree with

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the decisions of the group, we come to a compromise" (Elena) – "If you want to work well, you have to give space to all" (Beatrice) – "All we have tried to bring forward our ideas, then we have reached a compromise" (Sofia).

- Civic competences
  - The ability to engage effectively with others

    "I changed the way I work, leaving it to other" (Beatrice)

  - Display solidarity and interest in solving problems affecting the community

    "We helped each other" (Julia) (Elena) – "If you are working in a group, you must help and be helped" (Mattia) – "With a strong will you overcome difficulties and reach the common goal" (Eleanor) – "We have adapted to change roles to meet the needs of the other members of the group" (Beatrice) – "All we decided together, and if someone did not agree, we looked for a way to solve the problem" (Tatiana).

  - Constructive participation

    "I helped my classmates" (Julia) (Evan) – "I helped everyone, forever" (Thomas).

  - Readiness to respect the values of others

    "I accepted and considered the ideas of the others, without wanting to do everything alone", "We worked putting together all our ideas" (Giulia) – "When you are working in group, you have to think to a plural way and not in a singular one" (Beatrice).

Hereafter, the students' considerations concerning the metacognitive awareness developed through the work:

"I felt the protagonist" (Muslum) – "I felt involved and valued" (Muslum) – "Initially I felt disoriented, because I did not know all aspects of the topic" (Eleanor) – "I felt satisfied with my accuracy and reliability, but worried that my skills could annoy someone" (Beatrice) – "I felt capable" (Elena) – "I felt interested and excited about a new work" (Julia) – "I felt involved, like any good programmer" (Mattia) – "I felt involved and entertained" (Evan) – "I felt expert" (Thomas) – "I felt amused to work with others" (Simone) – "I felt excited about learning new things" (Matthew) – "I felt exalted and enthusiastic about an idea so innovative and unusual" (Samuel).

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Conclusion

The use of educational robotics as a teaching method has proven to be very useful to establish a dialogue between different disciplines and to develop core competencies. In particular, it increases the students' motivation to learn and helps to develop the ability to work in groups, the use of language and the spirit of initiative.

The research findings highlighted how "reciprocal teaching" improved the integration and the involvement of students with behaviour disorders in robotic activities, demonstrating how the use of robotics may represent a valid support to teachers and students alike. The role of the tutor created an atmosphere of respect for each pupil, improved self-concept, created a greater capacity for interpersonal relationships, inspired assertiveness and pro-sociality and taught to have less fear of difference. Moreover, students with behavioural disorders (namely, attention deficit, hyperactivity, emotional disturbances) found a source of low-impact autonomic self-control and self-fulfilment brought about by the interaction with the adults. It was the error in robot operations to act as such a source, governing time and the sequence to be followed.

Notwithstanding this, it is not possible to generalise the findings of a single experiment. Activities with secondary school students confirmed that educational robotics support social inclusion, and the adoption of methodologies that involve the use of robots allow both teachers and students to develop digital and collaborative skills, stimulating creativity and innovation in the process.

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CARER+: TOWARDS A DIGITAL COMPETENCE FRAMEWORK FOR CARE WORKERS IN DOMICILIARY CARE

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Introduction

This paper outlines the conceptual background, methodology, and evidence-based results of the research carried out to inform the development of a Carer+ digital competence framework for care workers in the domiciliary care sector. This research has been conducted within the Carer+ project that aims to develop the digital competences of care workers to improve the quality of life of older people.[1]

Today it is possible for almost everyone to receive the care they need at home, even if they suffer from multiple chronic illnesses. Yet frail older people still move to assisted living facilities or nursing homes. For many, that transition is driven by a lack of qualified caregivers, an absence of basic services such as transportation, no access to appropriate housing, and loneliness. Recent research has shown that a large segment of the growing number of older people in Europe can be encouraged to use technology-based services, and that modern ICTs (Information and Communication Technologies) and AAL (Ambient Assisted Living) technologies can radically improve their quality of life by supporting ageing well in the community and at home. The key mediator between these ICT-based opportunities and their integration into older people's lives stands in the available human resource represented by the domiciliary care workers and the set of competences they possess.

In recent years a number of initiatives and projects have reflected on the need to map the role of digital technology in the elderly care sector by investigating phenomena found at the interface between ICTs and care work. The CARICT project has illustrated the diversity as well as complexity of this domain. Within the project they selected and analysed fifty two ICT-based initiatives for caregivers in Europe (Schmidt et al., 2011) and from the evidence gathered they concluded that ICT-based services empower both care recipients and carers and improve their quality of life at affordable costs and without the feared dehumanising effects (Carretero et al., 2012).

Two inter-connected areas can be identified where the increased proximity of technology and care has advanced significantly: first telemedicine/telecare, and health monitoring systems and

second assistive technologies. Telecare, understood as remote assistance enabled by digital technology, has already gained wide recognition in the professional care sector, although international comparative analyses indicate persisting economic as well as political limitations (Kubitschke & Cullen, 2010). The area of assistive technologies covers an extensive range of solutions from simple alarm buttons, vital signs monitoring and self-diagnosis devices to complex systems known as smart homes. As these technologies become more commonplace in care provision then increasing levels of digital competence are likely to be to be expected in the near future in the care workers and caregivers across Europe (cf. Hjalager 2009).

However, technically clear-cut and specific application scenarios such as telecare and assistive technologies are only one of the drivers towards an examination of the digital competences of care workers and care working sector. The research described here to inform the Carer+ digital competence framework for care workers is based on the assertion that being digitally competent transcends mere technical dexterity and cannot be reduced to instrumental knowledge and skills such as operation of specific software. Rather, digital competence is to be understood as part of the:

> *"… essential life skills and assets in the information society. Developing digital competence should be considered as a continuum from instrumental skills towards productive and strategic personal competence. Mastering basic tools and computer applications is only a first step towards advanced knowledge, skills and attitudes," (Ala-Mutka, 2011, p.5).*

On one hand digital competence, as one of the key competences for lifelong learning (European Parliament and the Council, 2006), contributes to determining our overall capacity to engage with present-day social, cultural and economic settings. Yet, the theoretical notion of competence manifests itself in practice only through application in a specific context. Therefore, the central research question has been formulated as follows:

- How is the transversal or non-domain specific aspect of digital competence manifested, supplemented and modified through its contextualisation in care work?

Our approach to the concept of 'competence' and the underlying notion of learning outcomes is clarified below, before proceeding to the methodology for collecting empirical information on the components of digital competence in care work.,.

Competences and learning outcomes

The adoption and implementation of a 'learning outcomes' approach to educational interventions can be considered among the most significant developments in educational policy and practice worldwide in recent years. Within the framework of the European policies in education and lifelong learning, learning outcomes are understood as "statements of what a learner knows, understands and is able to do on completion of a learning process, which are defined in terms of knowledge, skills and competence," (European Parliament and the

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Council, 2008, p.4). However the definition and in particular the related implementation mechanisms remain far from unchallenged.

The literature in this domain covers a wealth of academic and practice-oriented debates on learning outcomes. Summarising these debates is beyond the scope of this paper but by way of illustration it is enough to state that the main objections to the concept of learning outcomes have been towards the reductionist implications in the behaviouristic conviction that all learning outcomes can take form of observable performances (Cedefop, 2012; cf. also Lassnigg, 2012). This is related to another line of critique that points to the danger of confusing the *sign* (a learning outcome statement) and the *signified* (the reality of learning it described), that therefore creates the illusion that the sole act of describing learning outcomes automatically implies their validity (cf. Souto-Otero, 2012). The misappropriation of the use of learning outcomes as a self-sufficient managerial instrument has been well demonstrated (Hussey & Smith, 2002). These critiques have been reflected in changes to European policy documents where the previously un-reflexive approach to learning outcomes prevalent in early EU policy documents (Cedefop, 2008) has been superseded by a more refined stance in later policy outputs:

> *"Contemporary accounts of learning outcomes emphasise their diversity and suggest that, where learning outcomes are tacit, context-bound or applied in combination with one another, then inferential rather than behaviouristic approaches will be more appropriate (...). Learning outcomes are no longer conceptualised as self-evident performances," (Cedefop, 2012, p.33).*

Related to this understanding of learning outcomes is the question of competence which situates itself as a key concept informing the Carer+ conceptual background. Some educational and training discourses use the terms learning outcomes and competence interchangeably (Cedefop, 2012), yet a conceptual distinction between the two allows for more clarity as well as it brings about a sound analytical strategy:

> *"Competences usually refer to practices in the workplace and, by extension, to wider social and personal practices. Learning outcomes refer not directly to work practices but to competences. Accordingly, learning outcomes are validated by their connection to competences which are understood as part of the world of work (as their source),"*

whereas learning outcomes are therefore part of the educational design. Thus, it is useful to distinguish:

> *"some systematic way of identifying competences and translating them into learning outcomes. (...) The conceptual separation of learning outcomes and competences allows us to see that learning outcomes can communicate between the status quo of competences in the world of work and competences*

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> *(specific to individuals) that enter the employment market in the future," (Cedefop, 2012, p.35).*

Rather than start at the level of inductively defining learning outcomes in terms of knowledge, skills and competence Carer+ chooses to start at the level of competence. This is deductively defined as a dialectic of knowledge, skills, attitudes and purposes, where broader competence areas derive from the socio-economic context and are translated into learning outcome *examples*. This approach has been inspired by the conceptual logic of the forthcoming European Digital Competence Framework, currently finalised by the EC Joint Research Centre, Institute for Prospective Technological Studies (Ferrari, 2012), which will serve as a structural model for the Carer+ digital competence framework for care workers.

Methodology

Four research phases were implemented to investigate the relevance of digital competences in the care sector, as well as to identify the digital knowledge and skills likely to emerge within care workers' activities in the near future: document analysis; expert focus groups; semi-structured individual interviews with experts; a questionnaire survey to care workers and caregivers.

Nine project partners in seven European countries participated in the research:

- 3s Unternehmensberatung GmbH (Austria) as the work package leader,
- Arcola Research (United Kindgom),
- EOS – Educating for an Open Society (Romania),
- Iperia L'Institut and Fédération des Particuliers Employeurs de France (France),
- Istituto per la Ricerca Sociale (Italy),
- LIKTA – Latvijas Informacijas en Komunikacijas Tehnologijas Asociacija and LSA – Latvijas Samariesu Apvieniba (Latvia), and
- TELECENTRE Europe (Belgium).

Focus groups and interviews with experts took place in all seven countries (AT, BE, FF, IT, LV, RO, and UK) in line with the research design, while the desk research and questionnaire survey were limited to countries where the pilot testing of Carer+ outcomes will take place in the next phase of the project (FR, IT, LV, RO).

Phase 1: Desk research – document analysis

The objective of this research activity was to identify and analyse accessible educational and occupational documentation in the care sector, examine how digital competence is reflected, and report examples of digital learning outcomes found. In particular, the following types of documents were consulted:

- Curricula of initial vocational training programmes for care workers;
- Curricula of continuing vocational training programmes for care workers;

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- National Qualifications Frameworks / Systems / Registers;
- Qualification standards;
- Assessment standards;
- Europass Certificate Supplements;
- Occupational standards;
- Job descriptions and job advertisements.

Phase 2: Expert focus groups

Within this phase of research, focus groups in all partner countries were organised, that brought together 5 to 10 national experts in various fields related to the project scope. In Phase 1 the outputs depended, in principle, on the quality of information available in external sources and thus turned out to be of miscellaneous relevance. But in Phase 2 the aim was to ensure that specificities identified within the scope of the Carer+ scope were addressed. In other words, the focus groups were expected to provide information on topics of direct to Carer+ around the interface between care work and digital competence.

For the objectives of the focus groups to be met, it was of great importance that the participants were selected according to the project rationale but also with regard to the diversity of views and fields of expertise. The participants in the expert focus groups thus included:

- leading personnel in care providing organisations, both public and private;
- leading personnel in charities, care worker associations and elderly associations;
- academics and researchers in the field of elderly care, eHealth, Ambient Assisted Living (AAL);
- medical and nursing professionals;
- experts in national as well as European policy of social cohesion, welfare and active ageing;
- entrepreneurs and technical experts in the field of assistive technologies;
- experts in digital literacy and e-learning.

The three principle areas of inquiry discussed in each focus group were:

- What is the current situation? What digital skills do care workers currently need and utilise? To what extent is ICT relevant in the field?
- How can ICT be further used to support both care workers in their work and care recipients in their daily lives?
- What new digital skills will care workers need? What should be included in a carer's digital competence list?

Phase 3: Semi-structured expert interviews

By interviewing selected experts individually, Phase 3 aimed to gain deeper insight in the research area, and to add more detail to information collected through Phases 1 and 2,. Each partner invited 5 to 10 experts for semi-structured interviews. The respondents may or may

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not have been members of the focus groups established in Phase 2, yet they were recruited from the same categories of respondents as in the case of focus groups.

Three themes were addressed during each interview, with the following inquiry logic and elementary questions:

- **Theme 1.** Current experience with implementing digital competence and ICTs in care work:
  - In general, what do you think about the relationship between digital skills/ICT and care work?
  - If you were to describe a care worker's typical day, how would the use of ICT occur in it?
- **Theme 2.** Care recipients' needs:
  - What, in your opinion, are the care recipients' needs that could be met using digital technology?
  - How you think care receivers will react to services involving digital technology?
- **Theme 3.** Digital competence for care workers and caregivers:
  - Presently, how are digital competences incorporated in care workers' qualifications?
  - Which digital competences would you name as substantial for care workers?
  - Which additional digital competences would you regard advantageous for care workers?

Phase 4: Questionnaire among care workers and caregivers

While Phase 1 derived information from official documentation, and Phases 2 and 3 investigated expert opinion, Phase 4 complemented the research with information from practitioners, i.e. care workers and caregivers. This was done through a multiple choice questionnaire filled in by care workers and caregivers either in hard copy or via an online interface. The project partners were asked to collect 40 completed questionnaires in each of the four countries involved in this phase, thus arriving at a total of 160 questionnaires. This would then provide a pool of data on practitioner's current digital skills and related views and preferences for the next research steps..

For the sampling methodology, the selection of respondent samples was non-random in two ways. First, the partners did not build representative samples of the whole population but selected respondents from the narrowly defined groups of care workers. Secondly, these groups tended to vary according to their member features and average profile among countries, for example, the probability of a typical care worker having a migrant status was significantly higher in Italy than in Romania. Legal provisions regulating the conditions for access to care professions also differed from country to country, not to mention the unofficial caregivers who were often reluctant to be surveyed due to their unofficial economical or migrant status. Therefore it was impossible to define common sampling quotas for all

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countries involved in the survey. The partners were advised to apply their judgement based on knowledge of their national situation to build as representative samples as possible. Professional organisations, foundations, care associations and other stakeholders with good overview of the field were consulted regarding the profile of the respondent sample in each country.

The questionnaire was divided into four sections:

- **Pre-section.** Category of respondent:
  - 4 questions on respondent's job, level of formal education, experience in care work, country of origin.
- **Section A.** Respondent's current level of digital competence:
  - 10 questions on (mostly instrumental) ICT competences; self-assessment on a scale from 1 to 10.
- **Section B.** Relevance of digital competence and technology in care work:
  - 7 statements assessed against a self-anchoring scale from "not at all" to "very much so" or its variants.
- **Section C.** Assessment of clients' needs:
  - 4 statements assessed against a self-anchoring scale from "not at all" to "very much so" or its variants.

Selected results

The following table summarises the outputs delivered as compared to expected:

Table 4: Research outputs

Research phase	No of countries involved	Outputs per country, planned minimum	Outputs total, planned minimum	Outputs total, delivered
1: Document analysis	4	not specified	not specified	**57**
2: Focus groups	7	1	7	**8**
3: Interviews	7	5	35	**46**
4: Questionnaires	4	40	160	**156**

Questionnaire survey to care workers and caregivers: selected evidence

The following tables demonstrate selected evidence provided by a quantitative analysis of the questionnaire survey conducted in four partner countries (Ziegler, 2012). Table 2, 3 and 4 contain some information on the sample, Table 5, 6 and 7 show respondents' answers to selected questions concerning their current digital competence and views on its future development.

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Table 2: Number of care workers and caregivers surveyed in each country; absolute numbers

France	Italy	Latvia	Romania	**Total**
55	19	40	42	**156**

Table 3: Distribution of respondents according to the type of involvement in care work; % of total

Freelance care worker/caregiver (hired directly by client)	Organised care worker/caregiver (hired by an agency, social service, etc.)	Care worker-to-be (currently in training)	Family member / relative	Other	**Total**
45	34	9	7	5	**100 %**

Table 4: Distribution of respondents according to the length of experience in care work; % of total

Less than 2 years	2 to 5 years	6 to 10 years	More than 10 years	**Total**
25	25	22	28	**100 %**

Table 5: "How would you assess your overall digital competence? (1= no skills at all; 10= top expert)"; % of total

1	2	3	4	5	6	7	8	9	10	n/a	**Total**
12	7	6	5	14	16	21	14	5	1	**1**	**100 %**

Table 6: "To perform your job well, the level of your digital competence is..."; % of total

Not relevant at all	Negligible	Fairly important	Very important	Don't know	**Total**
27	18	34	17	7	**100 %**

Table 7: "Do you think your elderly clients would appreciate additional services supported by digital technology?"; % of total

Not at all	Unlikely	Possibly	Likely	Very likely	Don't know	**Total**
18	24	19	10	13	16	**100 %**

Discussion

At this time the Carer+ project has conducted a qualitative analysis of the outputs of 8 focus groups and 46 semi-structured interviews with experts, and a quantitative analysis of 156 questionnaires filled by care workers. The following section outlines the preliminary findings.

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Expert views on digital competence in the care sector

A cross-referential analysis of the reports from focus groups and individual interviews (Valenta, 2012) allowed for identification of several areas where recurrent views were expressed across all, or in some cases, most countries. The more frequently expressed opinions can be divided into three thematic areas:

- views on the changing attitudes of the elderly (care recipients) towards ICTs;
- views on the ways care workers can support the elderly in this process of digital emancipation;
- views on how carers themselves can further utilise digital competence in various aspects of their work.

The majority of experts agreed that notion of digital competence can already be seen as useful and needed in the elderly care sector, and that it will gain a more central position in care work in a near future. This will partially be due to rapid developments in eHealth, tele-care and assistive technologies that are being translated from cutting-edge experiments into commonplace practical solutions that are affordable to a growing number of care services as well as care recipients. As importantly, every-day digital technologies such as personal computers, tablets and smart phones are becoming more pervasive and entering the lives of the elderly. The stereotype of elderly people opposed to digital developments and unwilling or afraid to engage in ICT-based services can no longer be taken for granted. A number of experts have acknowledged that recent experience shows that older people are increasingly open to digital technologies provided they are user-friendly and adjusted to specific user need. They are now more often losing their timidity and becoming willing to learn about the possibilities afforded by the use of ICTs.

However, many experts warned against exaggerated digital optimism and indiscriminate futurism. In the area of telemedicine, traditional solutions such as alarm buttons or self-diagnosis measurement devices are widely used by the elderly in home care, but more sophisticated arrangements such as video monitoring and other features of *smart homes* cannot yet be seen as standard. With regard to more widely available technologies, several interviewees pointed out that non-smart phone and television remain by far the most often used digital devices in the lives of the elderly. According to the experts, this fact should be acknowledged and ways should be explored to capitalise on the care receivers' familiarity with phone and television e.g. by extending TV functions to online connection or introducing to the elderly alternative ways of making phone calls via internet-based services such as Skype.

The area most frequently raised was the potential for ICTs' to improve the social aspects of elderly life. The majority of interviewees as well as focus group participants were convinced that online communication should be regarded as the primary benefit brought to home care recipients by digital technology. Easy messaging, video calls and chats can facilitate and intensify an older person's contact with his/her family and wider social circle. Online networks and communities can help an isolated person (re)establish relationships and get

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(re)involved in local affairs as well as remote ones. According to the experts interviewed, online interaction should no longer be considered dehumanising or inferior to "real" relationships. In their view, the avenues for online participation are now no longer cryptic code-based hideaways but allow for direct inter-personal contact, audio-visual communication, inclusiveness and productive togetherness. Yet there are risks with online participation and include the safety and privacy of the user. These are factors that older people might be particularly vulnerable to and this was often mentioned as one of the areas where the care-worker can step in.

When asked about the current average level of digital competence among care workers, most experts agreed that it is generally low and needs improvement. However, due to the heterogeneity of the target group it is difficult to draw universal conclusions. Qualified professional care workers are more likely to have a basic to average level of digital competence than unofficial caregivers. Normally, qualified care workers have completed a certain level of formal education and be in official employment with a care organisation. This tends to involve systematic training and CPD as well as require day-to-day work with ICTs for the purposes of administration, planning and reporting of care work.

Caregivers are often challenged by their lower social background, language barriers and lack of access to further learning. It was also reported that some caregivers are recruited from economic migrants coming from Eastern Europe, where they may have held qualified jobs and used ICT on a daily basis but chose to relocate and accept non-qualified jobs in Western Europe - in response to the difficult living conditions in their countries of origin. A good level of digital competence can be found among these caregivers (reported in Italy in particular). In conclusion, most experts agreed that further training in digital competence for care workers as well as caregivers is desirable, promising and appropriate with regard to future developments in the sector, and in society.

In the view of the experts the role of the carer as a guide and mediator who facilitates the care recipient's gradual adoption of digital technology was central. The presumption here was that the care worker who becomes digitally competent will allow him/her to encourage the care recipient to explore the advantages of digital technology, and guide them through various aspects of its usage. Experts agreed that the care worker should not be expected to perform the role of a "technician" who would be responsible for setting up equipment or for repairing tasks but instead should mediate the client's dealing with services such as internet providers, equipment sellers, etc. With more advanced levels of digital competence, the care worker should be able to assess a care recipient's individual needs, interests and preferences and recommend corresponding digital services. A digitally competent care worker will also be able to help ensure client's security in digital environments.

Often mentioned was the inter-personal merit of "learning together", i.e. strengthening social bonds between the care worker and the care recipient through purposeful interaction in exploring digital technologies and services.

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Apart from applying digital competence in their work with care recipients, the care worker is expected to utilise technology in supplementary organisational and administrative tasks. According to the experts, there is great potential in the portable modern device such as smart phone and tablet. Because geographic mobility and time flexibility are among the key principles in care work, the technology that allows for mobile connectivity should be seen as highly adequate a work tool for care workers. Planning, tracking, recording and monitoring visits to clients through smart mobile devices in real time was seen by the experts as beneficial to both care workers and the care services that employ them. Another area where digital competence was reported as increasingly relevant was care administration and management. Many care services either use special software already or see the adoption of one as a necessary next step. The ability to engage in digital administration was also reported as a precondition for care workers' career growth within their organisations.

Finally, e-learning and peer communities were repeatedly mentioned as highly advantageous for care workers. Digital platforms for the exchange of professional experience can potentially help care workers quickly consult immediate problems with peers, as well as enhance their overall care work competence in the long term. Also, caregivers who tend to be more liable to social isolation (for example due to language or cultural barriers) can overcome this predicament by joining a network of fellow caregivers or finding online new clients interested in their services.

Next steps

In the progress towards the development of a Carer+ digital competence framework for care workers, the complete research findings will be complemented by an analysis of literature on digital competence modelling. The Carer+ framework will take into account major developments in the area: the ECDL framework focused on instrumental skills (cf. ECDL, 2007); and the European e-Competence Framework that brought about a major conceptual advancement by defining broad ICT competence areas (Marinoni & Rogalla, 2010). The project is also likely to draw heavily on DIGCOMP – a comprehensive European digital competence framework that has re-defined the approach to digital competence in order to reflect its multi-dimensionality (Ala-Mutka, 2011) as well as to map, reconcile and integrate previous efforts in this expansive domain (Ferrari, 2012).

The matrix that combines the DIGCOMP-defined structure of general digital competence with research on the specifics of digital competence in care work will be published in mid-2013. It will provide the care sector with a comprehensive tool for the mapping and further development of care workers' competences to improve, in effect, the quality of life of older people.

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[1] See http://www.carerplusproject.eu. The project has been co-funded by the European Union, under the Competitiveness and Innovation Framework Programme: ICT Policy Support Programme.

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ASSESSMENT THEORY AND PRACTICE IN THESIS SUPERVISION: A STUDY OF INFORMATION AND COMMUNICATION TECHNOLOGY ENABLED SYSTEM (SCIPRO) FOR EFFECTIVE EVALUATION

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Abstract

This paper discusses Information and Communication Technology (ICT) support for thesis supervision assessment from a theoretical point of view. A case study methodology was selected due to the qualitative nature of this research and data collected through the observations and development team discussions. Formative and summative assessment methods were selected from the literature for the main discussion from the thesis supervision assessment point of view. Thesis supervision is a special type of pedagogy, which creates a flexible learning and teaching environment. Students and supervisors collaboratively work for designing a learning process to accomplish objectives of the thesis. Although the academic institution provides a general structure for the thesis supervision process, students and supervisors are in an unstructured environment, which can easily deviate from the study plan and hence, continuous assessment is highly required. Formative assessment methods provide a continuous feedback to both supervisors and students to take necessary actions to re-align the process. Summative assessments are used to assess the overall quality of the product in a particular point. When compared with traditional classroom teaching assessment practices, implementation of summative and formative assessment in thesis supervision process is a challenging task. Although both, formative and summative methods contribute to produce a quality thesis, implementation of formative assessment methods are more complex than summative methods. "SciPro", a web based thesis supervision information system was observed as a critical case. The observation of the selected case confirms that, facilities in "SciPro" have implemented formative and summative assessment principles and we argue that ICT enabled thesis supervision is highly supportive for implementing assessment theories in thesis supervision process.

Objective and methodology

The main objective of this research is to study theoretical suggestions for thesis supervision assessment and observe how ICT supports thesis supervision assessment in practice.

Considering the qualitative nature of the research, a case study methodology was selected to conduct this study. McCaslin and Scott define a case study as "Investigations of 'bounded systems' with the focus being either the case or an issue illustrated by the case(s)" (McCaslin & Wilson Scott, 2003). The thesis supervision process was selected as the boundary of this case study and tried to emphasis the characteristics of a qualitative case study research as defined by Merriam and discusses three characteristics of qualitative case studies as particularistic, descriptive and heuristic. The particular phenomenon in this case study is the assessment function in an ICT enabled thesis supervision system. Assessment theories, thesis supervision and ICT support for thesis assessment are the description of this study. The heuristic character is going to illuminate our understanding of how ICT supports implementing theory in practice. Creswell (Creswell et al., 2007) discusses three variations in case study that exist in terms of intent: the single instrumental case study, the collective or multiple case studies, and the intrinsic case study. We selected single instrumental case study, and in a single instrumental case study (Stake, 1995), the researcher focuses on an issue or concern, and then selects one bounded case to illustrate the issue.

The selected case

"SciPro" is a web based information system that was implemented at the Department of Computer and Systems Sciences, Stockholm University with the purpose of enhancing the quality of the thesis process using technology (Hansson, 2011). "SciPro" provides informational and communicational support for the overall thesis supervision process (Aghaee et al., 2012). A brief statistical overview of "SciPro" is given in Table 1.

Table 1: Number of Users and Projects in SciPro from 2010-2013

Period	Number of supervisors	Number of students	Number of projects
2010-2011	81	311 (Master) 390 (Bachelor)	300 (Master) 220 (Bachelor)
2011-2012	46	175 (Bachelor)	95 (Bachelor)
2012-2013	77	113 (Master) 229 (Bachelor)	113 (Master) 120 (Bachelor)

Thesis supervision process

Thesis supervision is one of the most complex and problematic pedagogical methods (Connell, 1985). Student and supervisor collaboratively work for designing the learning process to accomplish objectives of the thesis. Thesis supervision has features of Problem Based Learning (PBL) and Self Regulated Learning (SRL) methods. PBL is an instructional and learner-centred approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem (Savery, 2006) and there is a significant difference between traditional course work based learning and problem based learning (Jacob & Cherian, 2012). It aims to enhance students' application of knowledge, problem solving skills, higher-order thinking, and self-directed learning skills (Hung, 2009). The academic institution provides a general structure for a thesis

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supervision process, but supervisors and students are not restricted in the process of designing and executing their individual theses. Although a supervisor's guidance lives on actions, a student independently studies in a flexible environment. Hence, students are studying in an unrestricted environment, which can easily deviate from the objective of the process. According to the complexity of the thesis supervision, measurement and evaluation process is more challenging than traditional classroom teaching methods.

Literature review

Assessment is seen as a rather important and challenging part of education. The Quality Assurance Agency for Higher Education defines assessment as, 'Determination of students' skills, knowledge, understanding and abilities is used to promote learning as well as to ensure that students meet the intended learning outcomes' (QAAHE, 2006). In general, assessment refers to two activities (Astin, 2012): (a) gathering of information (measurement) and (b) using the measurement for institutional and individual improvement (evaluation). Mainly, two types of measures are important in thesis supervision; measurement of quality of the product and measurement of the process. Thesis report is the main product and, sometimes there may be additional artifacts according to the nature of the thesis. However, assessment methods are in many forms in literature, based on the nature of the case we selected to study of formative assessment and summative assessment methods. Formative evaluation concentrates on ways of improving a project or a programme while it is still on-going. Summative evaluation is undertaken after the project or programme has been completed and judges its overall effectiveness in a specific point. A useful distinction is that formative evaluations are usually intended for the project / programme participants while summative evaluations are intended for an external audience. Bob Stake, quoted in Scriven this as; "When the cook tastes the soup, that's formative; when the guests taste the soup, that's summative" (Scriven, 1991, p.169). Especially a thesis in the Information technology discipline is going to produce an outcome to be tasted by the industry, hence both types of assessment are important.

GPA or grade is an output of the summative assessment and, Astin (2012) argues that an interesting aspect of the GPA is that it tells very little about what a student actually knows. Although summative assessment seems very straightforward, it is a challenging task in thesis supervision context due to the special characteristics of the thesis process. In addition to the assessment of the final outcome, there may be interim summative assessments points. Black and Wiliam (1998) define formative assessment broadly to include all activities that teachers and students undertake to get information that can be used diagnostically to alter teaching and learning. Formative assessment is more complex than summative assessments in nature (Thiel & Feeney, 2005), and in a thesis supervision context it is more complex than traditional course evaluation. Formative assessment lies in the sequence of two actions. First a learner makes a perception of the gap between a desired goal and the present state. Secondly, a learner takes an action to close that gap in order to attain the desired goal. As discussed in "Thesis

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supervision process", thesis supervision is a complex, unstructured and problematic process and should employ both types of assessment methods to maintain the quality of the process and product.

We selected two previous studies in formative assessment, and they suggest a framework for implementing formative assessment in a learning process. The first study recommends seven principles of good feedback practice (Juwah et al., 2004). From the conceptual model and the research literature on formative assessment Juwah et al. (2004) identify some broad principles of good feedback practice. A provisional list might include the following seven items:

1. Facilitates the development of self assessment (reflection) in learning.
2. Encourages teacher and peer dialogue around learning.
3. Helps clarify what good performance is (goals, criteria, standards expected).
4. Provides opportunities to close the gap between current and desired performance.
5. Delivers high quality information to students about their learning.
6. Encourages positive motivational beliefs and self-esteem.
7. Provides information to teachers that can be used to help shape the teaching.

The second study identifies three processes with the different agents (teacher, peer, learner) and suggests the framework shown in Table 2 (Wiliam & Thompson, 2007), indicating that formative assessment can be conceptualized as consisting of five key strategies:

1. Clarifying and sharing learning intentions and criteria for success;
2. Engineering effective classroom discussions and other learning tasks that elicit evidence of student understanding;
3. Providing feedback that moves learners forward;
4. Activating students as instructional resources for one another; and
5. Activating students as the owners of their own learning.

Table 2: Five strategies for formative assessment (Source: William & Thompson, 2007)

<table>
<tr><th></th><th>Where the learner is going</th><th>Where the learner is right now</th><th>How to get there</th></tr>
<tr><td>Teacher</td><td>1. Clarifying learning intentions and criteria for success ...</td><td>2. Engineering effective class room discussion and other learning tasks that elicit evidence of student understanding.</td><td>3. Providing feedback that moves learners forward.</td></tr>
<tr><td>Peer</td><td>... understanding and sharing learning intentions and criteria for success ...</td><td colspan="2">4. Activating students as instructional resources for one another.</td></tr>
<tr><td>Learner</td><td>... understanding, learning intentions and criteria for success.</td><td colspan="2">5. Activating students as the owners of their own learning.</td></tr>
</table>

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Discussion

This section describes theoretical assumptions and suggestions of assessment inline with the thesis process. Although the summative assessment methods in thesis supervision are more complex than traditional classroom summative assessment methods, it is still a straightforward task. Hence we mainly focus our discussion on formative assessment. Steps in "Scipro" (practice) are discussed from beginning to end with related research findings (theory) as discussed by William and Thompson's aspects of formative assessment and Juwah et al.'s principles of good feedback practice in formative assessment. In addition to these two research findings, summative assessment and other research findings will be discussed accordingly.

From the formative assessment point of view, a Watson box is the first milestone in the thesis supervision process. Students send their ideas to the matching system in a short overview format. SciPro uses a template suggested by Watson (1994), referred to as "Watson's box", see Table 3. A Watson box helps to implement the strategy 1, 5 and to follow the principal 1. This format provides a holistic picture of the general idea, and this implies where the learner is going (process 1). Supervisors also use a Watson box for publishing their ideas and, hence when students select supervisors' ideas the same effect will continue. An activity plan tool can also be classified as an implementation of strategy 1 and principle 1. An action plan is a schedule of activities agreed to do by the students, and it guides the student as to where he is going, how and when? A sample action plan shows in Figure 1.

Table 3: Structure for student's project idea ("Watson's box")

What?	**Why?**
What puzzles and intrigues me? What do I want to know more about, or better understand? What are my key research questions?	Why will this be of enough interest to put it on the library shelves or present to my organization? Is it a guide to practitioners or policy makers? Is it a contribution to knowledge?
How – conceptually?	**How – practically?**
What models, concepts and theories can I draw upon? How can I develop my own research, questions and create a conceptual framework to guide my investigation?	What research methods and techniques shall I use to apply my conceptual framework (to both gather and analyse evidence)? How shall I gain and maintain access to information sources?

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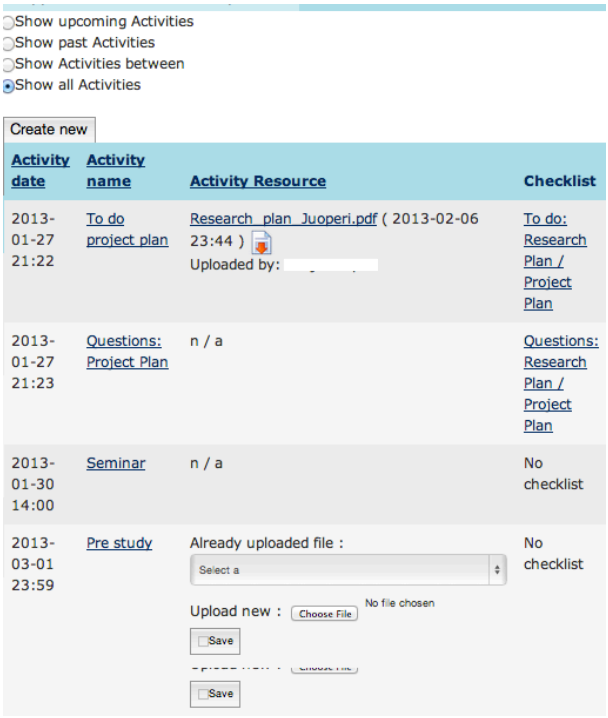

Figure 1. Screen shot of Activity plan

The peer portal and forum tools build a peer portal system and build infrastructure to implement strategy 3 and principle 2. The forum tool or public communications platform for students and supervisors or between students and their peers enhances knowledge transference. Figure 2 shows a screen shot of a peer portal, which facilitates students to communicate and quickly view the history. Two peer reviews are mandatory for all students and it activates students as instructional resources for one another. The online peer review system organises hundreds of students, so that they can receive and give feedback on each other's manuscripts in various stages based on prepared checklists. This changes the problem of supervising many students from a time-consuming disadvantage into a timesaving and quality improvement resource. The peer-review system is completely student driven, however, supervisors can access reviews and assess their quality if they want.

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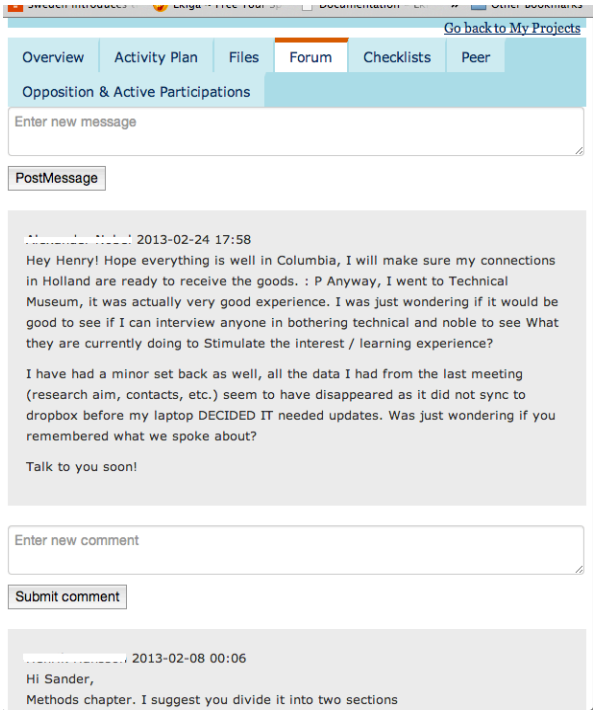

Figure 2. Screen shot of Peer portal

The checklist is a very important tool for formative assessment, and it implements principles 1, 2, 4, 5, 6, 7 and strategy 3, 4. A checklist is a collection of questions that focus on a specific task and each question has an indicator to express the view of a student, supervisor, peer or reviewer. A checklist is created by the student or supervisor and can be sent to others in the thesis project. Then both students and supervisors can set a colour for each question that represents the status of the inquiry. As it is, a traffic light system makes it possible to get quick attention from both students and supervisors. A sample checklist was given in Figure 3. Checklists with instructions for each phase in the scientific process guide students with information of what to do and when and how to review others' work. These checklists consist of several hundred screening questions the student needs to consider, and the supervisor, reviewer, examiner, and opponent need to ask the student. Since they are built in, the supervisor saves a lot of communication time and possesses an extensive pool of assessment questions.

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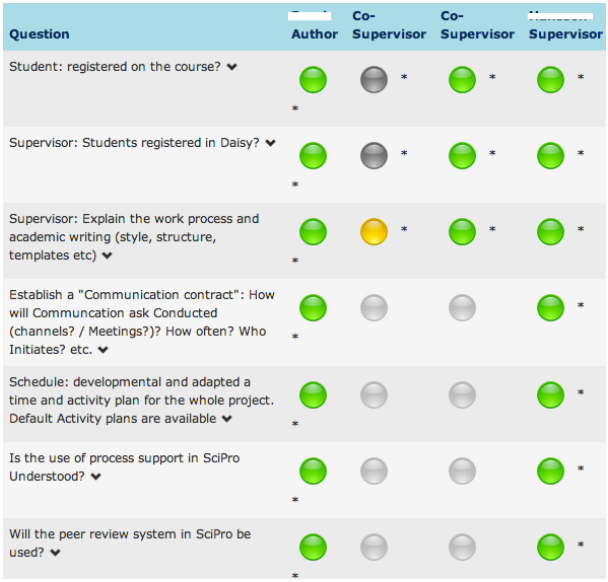

Figure 3. Screen shot of Check list

The overview tool provides a summary of useful information in a way to motivate students and it is equally important for all the principles and strategies (see Figure 4). An overview shows the current status of the thesis project at a glance with a traffic light and it indicates the progress of the thesis. If the indicator (bubble) is green, it implies the thesis is in progress and yellow represents attention needed but not urgent and red indicates the thesis is behind schedule and immediate attention is needed. All other information is also equally important and provides rich feedback to the student as well as supervisors. One more suggestion is if this view can be shared in social networks (Facebook/Twitter etc.) so that students can get attention very often. Principle 3 helps clarify what good performance is (goals, criteria, standards expected) and is implemented using a collection of rich web pages that are necessary for motivation and good performance. An enhanced video tutorial was recently launched, which would be useful for students to provide a clearer view of the thesis process. A screen shot of the information site (resources) is given in Figure 5.

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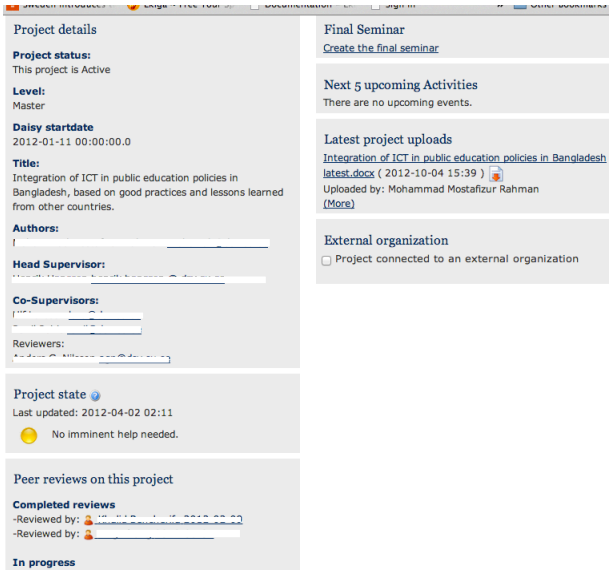

Figure 4. Screen shot of Overview

The "SciPro" workspace provides the necessary environment for summative assessment in any given point. The system has tracked and stored all the necessary resources for assessment, and evaluators can easily track the history of the thesis supervision process. As an example when the forum tab opens, the history of communication is displayed and when the files tab opens, it shows which files have been uploaded to the workspace. All these are vital evidences for assessment and can be used for assessment by the evaluators. A sample screen shot of the files tab is given in Figure 6.

Figure 5. Screen shot of Resource Site

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Figure 6. Screen shot of Files (part of workspace)

Conclusion

Formative assessment methods can be utilised to enhance the quality of thesis supervision throughout the entire process and summative assessment methods measure the quality of thesis in a specific point. There is a lack of specific research on thesis supervision assessment, and we selected two related research suggestions of formative and summative assessments for discussion. The thesis supervision process of "SciPro" was observed and studied with the suggestions made by the selected studies. As discussed in this paper, we argue that "SciPro" is significantly supported for implementing findings of assessment theories on the thesis supervision process. The main limitation of this study is we did not cover all the relevant assessment theories, and we suggest conducting a study of assessment theories and thesis supervision in detail to shape up a specific model for thesis supervision assessment.

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EXAMINING AT A DISTANCE – HOW DOES IT WORK?

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Abstract

The Open University of Israel (OUI) is a distance education institution which offers undergraduate study programs in a variety of disciplines, and masters programs in some disciplines. The course material, which is especially developed for OUI students, is distributed by 'snail mail' or via the internet. Tutorials, which are not mandatory, are held in study centres, and assignments are submitted via the internet according to a predefined schedule. The only time students are required to come to a study centre is when taking exams. The logistics underlying the exam system is complex, as is the academic aspect of the system. In this article we describe how the system works, first for the OUI as a whole, then for the Mathematics and Computer Science department specifically.

The Open University of Israel

From its inception, the Open University of Israel (OUI) has been a distance teaching institution. In the academic environment in Israel, the OUI differs from other universities in its organizational structure, teaching methods and in that it has no entrance requirements whatsoever.

The OUI offers a variety of study programs, mostly undergraduate programs. A detailed description of the undergraduate and graduate programs can be found on the OUI website (http://www-e.openu.ac.il). About 46,000 students are currently studying at the OUI, most of them in Israel and a few hundred abroad.

The OUI study method is a blended-mode which combines two methods of distance education: traditional distance education and web-based teaching. Both modes are based on the many years of experience accumulated at the OUI in the undergraduate and graduate programs.

Traditional Distance Education

Studying at the OUI is primarily a self-study process based on written materials and not on sitting and listening to lectures. Courses offered by the OUI are based on scholarly printed volumes, written by renowned experts in their field, and produced or especially selected for OUI students.

The process of developing course material is a very intensive and demanding task, which includes an extensive review process. Each course has a course coordinator who is responsible for the implementation of the course, including the recruitment of tutors. The coordinators and tutors are those who provide the contact between the student and the OUI. A faculty member supervises the academic aspects of the implementation.

The following describes the components of traditional distance education based on written material.

- Course books which are especially written or adapted for self-study, containing guidance questions, exercises and self-assessment questions.
- Optional face-to-face tutorials in the form of small group tutorials led by a tutor, and held at about 40 OUI study centres throughout the country. The tutorials are offered in a "regular" mode – nine two-hour meetings every other week – or in the "intensive" format, which includes fourteen to fifteen weekly three-hour meetings.
- Assignments and exams: In order to pass the course successfully, students must submit assignments, during the semester according to a predefined schedule and at the end of the semester they must pass the final examination, held at the study centres.

Web-Based Distance Education

All courses at the OUI have course websites that provide an interactive learning environment. The websites offer two types of communication channel: an administrative channel, that includes the course schedule, office hours and e-mail addresses of the teaching team and a list of students in the course with their e-mail addresses; and an academic channel that includes:

- Message board with notices posted by the course coordinator throughout the semester about the study material (e.g., clarifications, emphases, guidance) and about administrative issues (schedule changes, tutorial session changes, etc.).
- Discussion groups which provide group interaction among students, tutors and course coordinators.
- A personal activity schedule tool which gives the student a monthly view in the form of a calendar that shows all activities related to the course, such as the material that has to be covered every week, assignment submission dates, tutorial dates and exam dates.
- A personal notebook enabling students to gather and organize selected information from course websites and to add their personal comments.
- Enrichment materials: supplementary information on study units, exercises and exams for self-evaluation, sample exams, feedback on assignments, videotapes and recorded lectures, demonstrations, presentations, students' papers, references to current topics, links to databases and websites, etc.
- An online assignment system enabling students to submit assignments and receive feedback from the tutor online. The procedure is efficient and enables students, tutors and the course coordinator to monitor assignments. The system serves all students and is especially helpful to students who prefer to study at home or who live abroad.

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Assessment at the OUI

As already mentioned, in order to complete a course, students have to submit assignments throughout the semester and pass the final exam. The exams are held in the OUI study centres throughout the country, and for those who study abroad, exams are held in embassies worldwide. The duration of each sitting of each final exam is three hours.

The OUI offers three different exam sittings in most of its courses. The "A1" and "A2" sittings are held on two different dates, and students may choose between them. We let the students choose because most of our students are in employment, so they can choose a date according to their other commitments. Students who fail in the "A" sitting have a second chance in a later "B" sitting. The course team strives to ensure that the standard is the same in all the exams.

The assignments are written by the course coordinator and graded by the tutors. Since the exams are taken at a distance, the procedure of writing the exams is complex and meticulous. The course coordinator writes the first version of the exam and the solutions for each question, sometimes with the assistance of some of the tutors. A senior faculty member supervises the procedure by going through the exam questions and the solutions, approving the final version.

The exams are kept in a safe until the day of the sitting, and a few hours before the sitting they are distributed to the local study centres. In each study centre there are classrooms, where the exams are taken. In each classroom students from different courses sit, supervised by two or three supervisors. If students have questions about the exam, they write them on a special form and one of the supervisors calls the course coordinator at OUI headquarters. The supervisor then writes the answer and gives it to the student. Sometimes, if an error is detected in an exam by the course coordinator or someone else, a message will be sent out to all centres.

At the end of the sitting the exams are collected and sent back to OUI headquarters, then distributed to the course coordinators of the courses, ready to be graded.

All the exams for all the courses are held on the same day at the same time (16:00-19:00), with the exception of the exams held abroad. Because of different time zones the exams are held at different times, thus different exams are written by the course coordinator for the students who take the exams abroad.

Because of this complex logistics, the process of developing an exam is meticulously handled. Great efforts are made to avoid corrections of typos or mistakes during the sitting of the exam.

A special unit at the university is responsible for the logistics of the exams. In each Autumn and Spring semester, 1,500 exams for different courses are written and administered. In the summer semester, which is a short semester, "only" 750 exams are written. In every semester there are 16 different appointed times for exams.

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The exams are graded by the course coordinator. The final grade of the course is made up of the assignment grade (up to 30 %) and the examination grade (up to 70 %). In some of the courses a final project is submitted and in these cases the final grade also takes into account the project grade.

The MATMON System – Assignment and Exam Management

The MATMON system was primarily designed to improve preparation and checking of assignments and exams. The system helps the teaching staff to design and assess exams and assignments, and create an exam and assignment database as well as an item bank for each course. The database affords easy and efficient retrieval by characteristics, and serves as an archive. It includes statistical data on exams over the years. Designed with an advanced and user-friendly interface, the system includes a security mechanism that provides, for each coordinator, access to his or her courses only.

The database contains, for each course, all the exams for every semester and each sitting. For each exam the database keeps the number of students who took it, the average grade and the standard deviation. In addition, for each question in each exam the database includes its average grade and its standard deviation. It also includes the number of students who answered this question. The course coordinator, when retrieving this data, may add to each query some criteria, such as the topic with which the question deals, the course unit number where this topic is taught, the difficulty level of the question etc.

The information that can be retrieved from MATMON can be used for analyzing the various exams, providing insight and helping tutors to compose better exams.

The CS1 Course

In the previous sections of this paper we described the OUI in general and the method of assessment at the OUI. As members of the Mathematics and Computer Science Department, we now concentrate on analysing the final exams in CS undergraduate courses, especially the CS1 course, entitled "Introduction to Computer Science using Java".

Course Description

The CS1 course is based on 20 videotaped lectures. The lecturer is Prof. Jeffrey Rosenschein from the CS department of the Hebrew University of Jerusalem (Gal-Ezer, Vilner & Zur, 2009).

The series of lectures which are placed on the course website contain all the material covered in the course. In addition the students get a booklet with the slides used by Prof. Rosenschein, a specially developed study guide containing additional explanations, as well as exercises and solutions (in Hebrew), and the book "Java Software Solutions" by Lewis and Loftus (Lewis & Loftus, 2012), which is used as a reference book. We teach Java, using the BlueJ environment (http://www.bluej.org).

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The course does not require any previous programming knowledge, and even students with no background at all can achieve a high level of success in the course. Since we have an open admission policy, and this is usually the first course students take towards an undergraduate degree program in CS, the students are very heterogenic in their level of knowledge and skills when they enter the course. Some students have studied CS in high school, some are already programmers in the high tech industry, and some have no knowledge at all.

Along with the course material we provide eight assignments; the students are required to submit at least five. The assignments are graded, and contribute to the final grade of the course. Each assignment, except the first one, includes questions that require writing Java programs and relate to various theoretical subjects.

Like all the courses at the OUI, the CS1 course has a website which serves as an interactive learning environment, and provides an administrative channel and an academic channel as described above. The website also contains sample exams from previous semesters. For some of the exams we provide their solutions.

Final Exams

Final exams are supposed to reflect the material covered in a course and which is expected to be understood and internalized by the students. Exams are also intended to be fair, in the sense that students who studied the written or videotaped material and submitted assignments throughout the semester should be able to pass with a reasonable grade. Anyone who has ever composed an exam is aware of the complexity of this mission.

In the CS1 final exam the students may use only the lecture slides booklet, and the reference book "Java Software Solutions". The exam is written on paper only. No use of the computer is allowed during the exam.

The CS1 Final Exams

Over the years, we have composed some tens of exams, and collected related data in the MATMON system. In the following we show how we used MATMON to analyze the difference between exams from three different sittings, and for different types of questions, for the sake of ensuring the same standard in all three sittings and fair questions. We examined 3,918 individual exams collected from 30 final exams taken from 2007 to 2012.

Three Different Exam Sittings

Most of the students in the CS1 courses prefer to take one of the first two sittings, the "A1" or the "A2" sitting. Most of the students who take the third sitting (the "B" sitting) are the students who failed one of the A sittings, and this is their second chance to pass the exam. Therefore, we can assume that these are generally weaker students, hence we were not surprised to find that there was a substantial difference (7 points) between the average of the grades of the "A" sittings and that of the "B" sitting. The average of the grades of the "A"

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sittings was 58.01 (out of 100) while the average grade of the "B" sitting was 51.04. This result was found to be statistically significant ($p < 0.0001$).

Table 1 shows the results of the T-test.

Table 5: T-Test Results, regarding the difference between the grades in the first two and the third sittings.

Sitting	Students	Mean	Std Dev	Equality of Variances	Degree of Freedom	t Value	Pr > |t|
two A sittings	2853	58.01	24.58	Equal	3916	7.86	<.0001
B sitting	1065	51.04	25.10				

However, we also noticed that there is a difference of about 3 points (out of 100) between the average grades of the two first sittings, A1 and A2. The average of the grades in A1 was 59.79 (out of 100) while the average grade in A2 was 56.60. Though this is not such a big difference, it is statistically significant ($p=0.0006$), because of the large number of participants. We therefore attempt to explain it. We have noticed, over the years, that those students who are not quite sure about their knowledge usually prefer to take the A2 sitting, which is held 3-14 days later than the A1 sitting, thus giving them more time to prepare for the exam. We believe that this is the reason for the difference, and not the level of the different exams which was our concern and the reason for checking it.

Table 2 shows the results of the T-test.

Table 2: T-Test Results, regarding the difference between the grades in the first two sittings.

Sitting	Students	Mean	Std Dev	Equality of Variances	Degree of Freedom	t Value	Pr > |t|
A1	1264	59.79	24.07	Equal	2851	3.45	0.0006
A2	1589	56.60	24.98				

The rather low average grade of the final exam is due to the fact that our university has an open admission policy. Thus the first courses, and CS1 in particular, help students to find out whether they are capable of coping with academic studies, especially the CS undergraduate program. Many students, unfortunately, fail.

Different Types of Questions

Based on MATMON's data we can not only differentiate between different exam sittings, but also find out how students coped with different types of questions, and check the way we composed the exams, trying to be fair while maintaining the high level of the exams.

The exam normally contains 5-7 mandatory questions, of which 2 or 3 are questions which require writing code in Java. The other questions do not require writing but rather reading and understanding given code. In some of the questions the students are asked what the code executes, in some the students are asked to write the output, and in some of the questions the

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students are required to respond to various concept questions related to the given code. Following Bloom's taxonomy (Bloom, 1956) which is demonstrated by Thomson et al. in their paper (2008), and the Solo taxonomy (Biggs & Collis, 1982) used for example in (Lister et al., 2006), some of the questions test knowledge and comprehension, some of the questions are application questions which require the students to solve problems in new situations by applying acquired knowledge, and some of the questions require analytical and synthesis skills.

In each exam we usually have five different categories of questions according to the topics the questions deal with:

- Recursion
- Efficiency
- Linked Lists
- Binary Trees
- Inheritance and Polymorphism

Table 3: Averages of grades according to the different topics

Topic	**Average grade**
Recursion (writing)	48 %
Recursion (understanding)	52 %
Efficiency (writing)	48 %
Efficiency (understanding)	62 %
Linked lists (writing)	55 %
Linked lists (understanding)	63 %
Binary trees (understanding)	60 %
Inheritance and Polymorphism (understanding)	62 %

For the first three topics, recursion, efficiency and linked lists, we had three different kinds of questions. One kind required writing code and the other required understanding written code which we provided. For binary trees and inheritance and polymorphism we set only questions that required understanding code.

Table 3 shows the average grades for all the questions we examined. Notice that we did not include the standard deviation – our group of students is very heterogenic due to the open admission policy of the OUI, so the standard deviation is very large.

It can easily be seen that the average grade of the questions that required writing code is lower than the questions requiring comprehension of code. We came up with this result after analyzing the data provided by MATMON in line with the professional literature (Whalley et al., 2006).

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Discussion and Summary

The challenge of finding fair assessment tools is a crucial issue discussed in the professional literature. When referring to distance education this becomes even more crucial since the exams are taken at a distance. In this paper we describe the way assessment is carried at the OUI, and especially how a data base especially designed to help improve preparation and checking of assignments and exam scan help the teaching staff to check the exams after they have been taken and graded, analyze the results, and accordingly prepare better and fairer assessment tools.

After examining the differences between the grades achieved in the three different sittings, we decided that the most important thing is to maintain the high and consistent level of the exams. In addition, the exam has to test different types of skills, such as writing code and comprehension of written code. These skills are very important in CS students' training. Thus, we do not intend to change the level or structure of the exams. We will certainly keep monitoring the grades of the exams in general and each question in particular, and not repeat the questions which were found to be problematic.

The logistics of the exam system is complex, the alternative nowadays is of course that of web-based exams. At the moment, because of the known drawbacks, we are not considering shifting to web-based exams. There is one critical element though we would like to change, this is the way of asking questions during a sitting. Technology can no doubt assist here and we are considering a number of options.

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AUTOMATISED EXAMINATION OF PROGRAMMING COURSES – DESIGN, DEVELOPMENT AND EVALUATION OF THE AUTOEXAM ONLINE SYSTEM

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Abstract

Traditional hand-written exams are still the main assessment method in programming courses at Swedish universities. Several conducted research studies indicates that computer based examination is a more natural environment for student examination and that the most authentic form of examination for programming courses should be to solve problems at a computer. The aim of this study is to describe the development of the web-based *AutoExam* system and discuss how the software system might contribute to modern programming education. AutoExam is designed and deployed as an online system and the artefact is constructed by using the Python programming language and the *Django* framework with a three folded *Model-View-Controller* division. As a main approach for this study methods defined in Design Science to be able to cover all the phases in the design, implementation, evaluation and communication of the AutoExam software artefact. The implemented automatised assessment system was evaluated in test examination by students with basic skills in the Python programming language. Semi-structured interviews were conducted with two programming teachers at the Department of Computer and Systems Sciences at the Stockholm University. Answers from the students' tests were analysed by using the *One-Way Anova* analysis method. The results were insignificant but showed a slightly better result for answers that were generated in the AutoExam environment. Both the interviewed teachers posit that there are positive aspects of computer generated examination answers both from the teachers' and the students' point of view. Our recommendation is that the kind of automatised examination of programming skills that is described in this article ought to be tested and evaluated in larger student groups and during longer time than what has been done in this limited study.

Introduction

Amongst Universities and Technical institutes in Sweden, there is still common practice to examine programming courses at introductory level with traditional hand-written exams as the main assessment. This is normally accompanied by several assignments with more practical programming exercises that are submitted separately during the course, before the

final written exam. To have this kind of dual headed setup is motivated by the fact that programming courses should assess two different things, programming skills and theoretical knowledge. To assess the students' knowledge on Computer Science and Programming theory has seldom met any objection, but the fact that the skills in code construction are tested by paper programming in written exams have been questioned several times in several countries.

> *"Having to produce working code during the final exam exhibits the student's actual programming ability" (Medley, 1998)*

> *"In general we can still see that programming courses have examination on paper instead of computer-aided exams. The laboratory work is done at the computer. Why not the exam? The most authentic form of examination for programming courses should be at the computer" (Jonsson et al., 2002)*

Despite the suggestions from researchers where it has been posit that a change of environment, from teaching and practicing to examination, creates unfair conditions for the examining students (English, 2002) there are still few sign of changes at Swedish universities

Paperless Examination

A study done by Medley (1998) indicates that examinations performed in an online environment tend to mitigate the unnatural setting of writing hand-written exams even if there were no statistical differences regarding the results between the compared environments. Cassidy and Gridley (2005) states that an examination performed in an online environment generates less examination related anxiety and lower levels of perceived threat regarding an examination situation if compared to an examination written by hand. This was especially the situation for the top 25 %-rated in the studied student group.

In other parts of the world like China, the use of web based examinations is widespread and has been so for some time. One reason seems to be the campaign in education of basic computer skills that was launched in the country (Zhemming et al., 2003).In China the term Paperless Examination is an accepted and widely used term. Paperless Examination can be applied to any kind of examination or assessment taking place in a computerised and often online environment. In this approach paperless and automatised examination with auto-grading is developed to be an effective solution for mass education (Zhemming et al., 2003). This study will explore if the same basic approach to design and develop a tool for automatised assessment and finally evaluate if this might contribute to improve the quality in modern technology enhanced assessment.

Aim

The aim of this study is to describe the design, implementation and evaluation of the web-based AutoExam system and discuss how the software might be useful in programming education.

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Constraints

This study has a focus on the development and evaluation of the AutoExam tool. There is no analysis done on web security issues or the online authentication process which both must be taken care of before the system can be used in real course examination contexts.

The AutoExam System

AutoExam is designed developed and deployed as an online system (AutoExam, 2012). The artefact is built in the Python programming language by using the Django framework, with a three folded **Model-View-Controller** approach (Django Project, 2013) and the description of the system below will also be divided into these three parts or layers.

Model

The model layer of the AutoExam system consists of two separate model classes where one separate Question-class holds the questions of the actual examination which facilitates the scalability of the artifact. Furthermore this enables the usage of examinations in other programming languages simultaneously, since each instantiation of the Question-class can be reached and manipulated independently. The questions used in the examination, are stored as UTF-8 encoded strings in a Django model text field.

The other part of the model layer is the examination-class, named Tester. An object of this class is instantiated each time a volunteer uses the randomly created disposable password to log in to the system. This functionality keeps the workload of the database to a minimum since no unused data is stored and the workload of the facilitators is kept to a minimum as well.

View

In the view layer of a Django application HTML-templates display results from the systems Python sections. The AutoExam artefact uses these templates to display the questions and the data saved from the test examinations stored in a database. Every submitted answer is stored as a simple text string in the database. This string is fetched as a Python variable which is loaded as the value parameter of the textarea intended for editing the examination answers. If the examinee wishes to save their changes, the save button triggers a function that converts the entered input into an UTF-8 encoded string and simply replaces the previously saved submission.

Controller

There are a total of six functions in the controller layer of which two are used only to handle user authentication and logout. Two other functions handle the cookie controlled time frame. The *startScreen-function* creates the HTML form used to submit the email address to which the authentication credentials are sent. This function also instantiates new user objects in the

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database and assigns randomly created passwords to them. The *q-function* handles all the interactions between the examinee, the AutoExam software and the database holding the stored data. After writing and editing the code the examinee can use the button labelled *Save* to store changes to the database.

JavaScript

The AutoExam system uses several JavaScript functions that need to cooperate in order to make the artifact perform satisfactorily. Of these functions the most central ones are the functions controlling the syntax highlighting used to simulate the features in Pythons integrated development environment **IDLE**. In the AutoExam early prototype this was handled in the controller layer and only returned each time the source code was saved at database level with a subsequent page load or reload. To be able to update the syntax highlighting instantly it has to be carried out as close to the users view as possible which makes a JavaScript solution the natural choice. To connect the syntax highlighting functions to the source code entered by the examinee, the built-in event onKeyRelease is connected to the text area designated for entering code. This arrangement calls the syntax highlighting functions every time a key on the examinees keyboard is released.

Methodology

The main approach in this study has been the use of methods defined in Design Science since the AutoExam project is about development and evaluation of a software artefact. There is nothing contradictory between the choice of Design Science and the use of Social science research methods. Interviews, observations and surveys can be used to produce a specification of requirements and to support the evaluation of artifacts (Johannesson & Perjons, 2012).

Design Science

Design Science is a scientific research method based on the idea that problems can be solved using artifacts, where artifacts may be physical items or entities such as blueprints or digital systems. (Johannesson & Perjons, 2012) Design Science should try to enhance human and organisations' possibilities by designing and developing new and innovative artifacts (Hevner et al., 2004). This is an approach that originates from engineering (Simon, 1996) and contains methods for developing and evaluating artifacts iteratively and incrementally (Johannesson & Perjons, 2012).

A set of guidelines for how Design Science should be applied to develop artefacts has been created by Peffers et al. (2008). The main idea is to use a process model consisting of six firmly defined activities:

- Problem identification and motivation
- Define objectives of a solution
- Design & Development

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- Demonstration
- Evaluation
- Communication

To collect data for the first two steps semi-structured interviews were conducted with two programming teachers at the Department of Computer and Systems Sciences at the Stockholm University. Based on the initial data collection a software prototype was designed, developed and demonstrated during October – December 2012. For the evaluation a total of 30 examinations were performed during December 2012 and January 2013, where 18 of them were executed in the AutoExam system and the remaining 12 examinations were conducted as traditional pen and paper exams. Informants and software testers in the evaluation sessions were students from Stockholm University, Umeå University and Linköping University in Sweden. The final sixth communication step will be implemented as a series of articles, a thesis and written feedback to the informants.

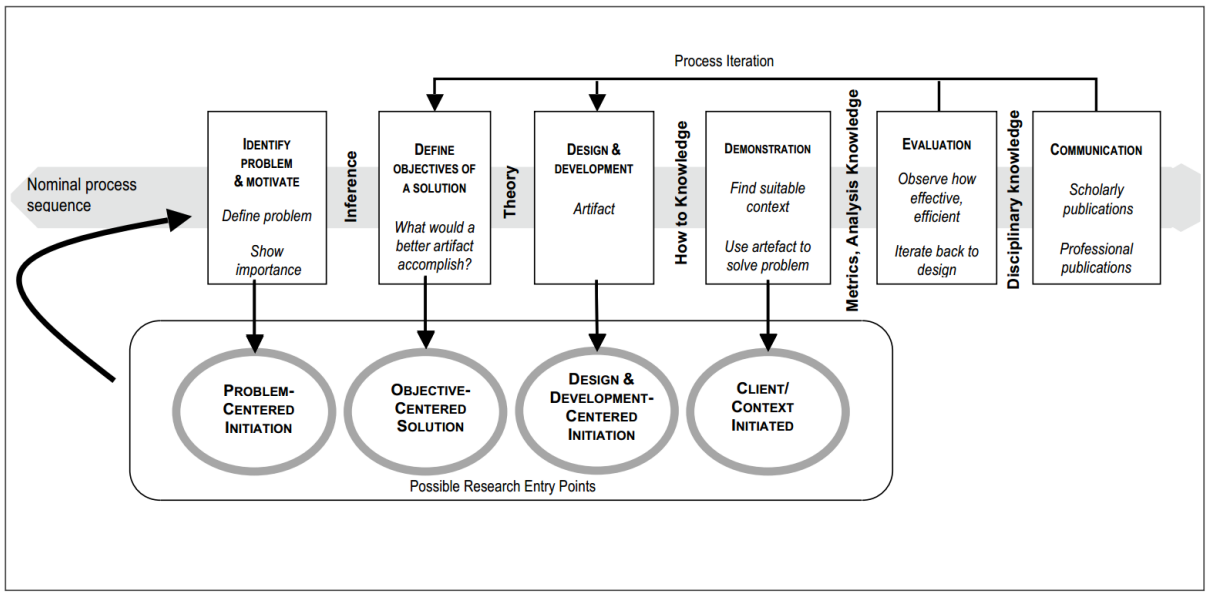

Figure 1. The steps in the iterative *Design Science Research Method* model by Peffers et al.

Questions for the Test Examinations

Test examinations consist of three separate questions, with a basic level of difficulty fitted for student's taking their first introductory programming course at university level. These questions should be answered either by editing the existing Python source code, or by creating new source code. Our aim was to cover as wide scope of knowledge as possible in the constraint of only using three questions. Both the early prototype and the fully implemented *AutoExam* artifact only use questions in Swedish. The translation to English is done to increase the readability of this article.

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Question 1: Extend the list below with two more items of any type. Print out the length of the list.

```
list = [‘one’, 2]
```

Question 2: Print all of the given variables, var1, var2, var3, in one print statement.

```
var1 = ‘string’ var2 = 123 var3 = 345.7
```

Question 3: Iterate over the given tuple and print the values, one value per line.

```
tup = (1,2,3,4,5)
```

Test Examinations

To evaluate the AutoExam system as an assessment tool test examinations based on the questions in the previous chapter were conducted with selected students. Exactly the same questions were given in both test environments.

Paper based examinations

The primary aim when designing the paper-based examination and the surrounding environment was to recreate the settings given during a traditional pen and paper examination. A secluded room was arranged so that disturbing surrounding elements was kept to a minimum. The students were presented the general outlines of the examination beforehand before they randomly picked one of the sealed envelopes containing the exam and a questionnaire to assess their previous programming experience. There was a time-limit set to 30 minutes in total starting when the students opened their envelopes. One of the authors was present as a supervisor to monitor and to answers any questions that might arise.

Examinations conducted in AutoExam

The students who had volunteered to take the examination in the AutoExam environment were given a randomly generated identification number with an accompanying password which gave access to the system. Once the student had used their password to access the system, a timer counting down from 30 minutes of disposable time started. After the time had expired students were still able to navigate within the system, but could no longer save any changes in their answers. The main reason to deploy the AutoExam prototype online was to simplify for students to be able to do the examination anytime from anywhere.

Test Examination Results

Answers from the test examinations were analysed by using the One-Way Anova analysis method. The results were insignificant but question one and question two showed a slightly better average score for examinations taken in AutoExam. Question three on the other hand showed a slight advantage for examinations conducted by hand with pen and paper.

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Findings, Conclusions and Recommendations

Findings show that there is no significant difference between the automatised examination and traditional pen and paper assessment of the tested programming skills. Since several studies indicates that computer based examination is a more natural environment for students (Medley, 1998; Jonsson et al., 2002; English, 2002), our recommendation is that assessment of programming skills should be conducted as close as possible to the programming situation used in the programming courses.

Both interviewed teachers mentioned that it sometimes is hard to read the handwritten answers when the exams are corrected and that it happens that sentences paragraphs are classified as unreadable. The male teacher mentioned the *halo effect* (Sutherland, 1992; Michelioudakis, 2011) and that there might be a risk that bad handwriting might create a general negative attitude towards the examinee. The female teacher thinks that computer generated answers could save time for the correcting teacher and avoid misunderstanding. None of the interviewed teachers finds automatised computer assessment to be an issue starting with *Generation Y* (Mozelius, 2012) or the *Nintendo Generation* (Guzdial & Soloway, 2002) since this matter has been discussed at the Department of Computer and Systems Sciences at the Stockholm University since the 1990s.

Before the introduction of a system like AutoExam authentication and multi-user security problems must be investigated, but these issues might be solved in the same way as online bank systems and web shops have been made secure. There will initially be some costs for the implementation of systems for automatised examination but in a longer perspective they will be cost effective, especially if the software will be enhanced with auto-correction and auto-grading. Our recommendation is that automatised examination of programming skills should be tested and evaluated on programming courses in larger groups and during longer time than what has been the case in this limited study.

Future Work

An interesting next step would be to implement a fully automatised grading feature in the system. Other fields to investigate are the examination related web security and online authentication of AutoExam users.

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COMPETENCES AND RUBRIC ASSESSMENT

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Abstract

Over the last years there has been an increase in the number of measuring tools that allow, by establishing criteria and standards per levels, to determine the quality or the efficiency on specific tasks performed by students and to assess the level of competence achieved.

One of the most well-known is the rubric that is an assessment matrix which establishes the criteria and performance indicators through a scale to determine the quality of student performance in specific tasks within a continuum which typically ranges between 1 and 10.

In this paper we will point out the steps to be followed for the design of an assessment rubric, bearing in mind that its ultimate goal is to test its efficiency and effectiveness for the assessment of a specific competence. To do this we have carried out a non-experimental research design with a descriptive and interpretive purpose and we have used typical instruments in a process of qualitative research: content analysis of discussion groups and the forum of the subject used by the students.

Theoretical Framework

In recent years there has been a significant increase in the number of measurement tools that allow, through the establishment of criteria and standards by levels, the performance or quality of specific tasks performed by students to be determined and assessments of the level of competence achieved.

The assessment rubrics or matrices are one of the instruments that most publications address.

According to Díaz Barriga (2005), rubrics are assessment guides or scales in which progressive levels of control are established regarding a person's performance shown with respect to a specific process or production. Furthermore, rubrics consist of a wide range of criteria that allow a progressive evaluation so that the performance of the task assessed can be checked, with a range from poor to optimal performance.

This instrument has many advantages. Those described by Mertler (2001) are shown below:

1. They are a powerful tool for professors because they are able to make more objective evaluations since the measurement criteria are explicit and made known in advance to all students. They cannot be modified once they are published and all students are assessed equally based on them.
2. They promote positive attitudes towards learning since they clarify the professors' objectives with respect to a particular competence and how it can be achieved.
3. They allow professors to qualitatively describe and determine the different levels of achievement that students are expected to attain.
4. They allow students to do a self-assessment and make a final review of their work before handing it in to the professor.
5. They clearly indicate to students the problems or gaps in the competence area being developed and this information provides constant feedback about the teaching-learning process.
6. They provide professors with feedback about the effectiveness of their teaching process.
7. They provide students with feedback about their strengths and weaknesses in the areas that need to be improved.
8. They minimise the subjectivity of the assessment.
9. They encourage students to take responsibility for their own learning.
10. They provide specific criteria to measure and document student progress.
11. They are easy to use and allow the performance achieved through doing the proposed task to be explained in detail.

Therefore, the rubric becomes a very versatile tool which provides students with feedback which allows them to improve their work immediately, and it also provides professors with the opportunity to express their expectations about the learning objectives (Mertler, 2001).

However, not all rubrics are useful or reliable, or allow the acquisition of knowledge, skills or abilities by students to be assessed (Jonsson & Svingby, 2007). Popham (1997), in an article on the trend of assessing through rubrics, warns about their dangers. The author observed that one of them involved using this instrument when it is not directly related to the ability to be measured. Hence, during the design of a rubric, we should consider its purpose and use standardised procedures that allow us to determine its validity.

The recommendations on creating rubrics for assessing WebQuest, developed by Pickett and Dodge (2001), should also be reviewed.

The aim of the rubrics designed in this experience is to monitor student progress through continuous and educational evaluations, a retroactive process that should allow feedback and monitoring of the whole process of teaching and learning in order to detect ¡difficulties in building strength in different content areas and acquiring competencies as soon as possible

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(Nicol and Macfarlane-Dick, 2006; Heritage, Kim, Vendlinski & Herman, 2009; Stull, Varnum, Ducette, Schiller & Bernacki, 2011). Obviously, the professor actually observes the performance for each of the suggested competency-building tasks and activities suggested (Ferreras and Wamba, 2008).

Method

Considering that the final goal is to test the efficacy and effectiveness of a rubric for assessing a specific competence, a non-experimental research design was carried out with a descriptive and interpretive purpose and typical instruments were employed in a qualitative research process: content analysis of discussion groups and forums on the subject used by the students (Báez Pérez de Tudela, 2007; Flick, 2007; Osses, 2006, Taylor and Bogdan, 1987). The authors avoided arbitrariness, subjectivity and generalisation by systematically categorising responses according to previously established criteria.

First, a discussion was held with professors of the subject to determine in detail what competence the students should achieve and what components define it. This task allowed us to realise that the components of the competence "Implementation of the scientific method in a research project" were: Style of written communication, introduction, theoretical framework, methodology, data collection and analysis of results and conclusions and discussion) and four levels of proficiency were established (Excellent (9), Good (6), In Progress (4) and Poor (2)).

The 12 professors of the subject do not teach in the same program. They were chosen because they teach a subject called "Research Methods and Techniques Applied to Different Fields of Knowledge". This course is for undergraduates in four cases and masters students in eight cases and the professors are on the faculty at the University of Vigo (4) and National University of Distance Education (UNED) (8).

Based on the work carried out by Cadenato, Martínez, Graells and others (2010), the steps in the process of rubric construction were as follows:

1. Defining the components of the specific competence.
2. Setting competence levels for each of the components.
3. Planning activities to gradually master the competence.
4. Suggesting correction rubrics for each component and describing the level of proficiency.
5. Checking its validity comparing it with a multiple-choice test and an assessment by expert judges.

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Results

The most important aspects are summarised below, organising them into three categories of analysis:

Problems detected during the validation process

All professors have noted two difficulties. On the one hand, the difficulty in relating the specific indicator with the ability intended to be measured and on the other, the difficulty in determining which activities are best suited to develop the different indicators of the competence to be assessed.

To counteract this difficulty, the purpose of the rubric was always kept in mind during its design, and professors of other subjects were asked to explain the meaning of each indicator.

Advantages of using rubrics

From the professors' perspective, it is agreed that the rubrics give rise to:

- Analysis and reflection on the teaching-learning process, which allows a critical explanation of what is supposed to be assessed.
- Relating marks very specifically to the level of knowledge acquisition of each student.
- Evaluation of the difficulties students had in the learning process and establishing the progress criteria that every student should make.

From the students' perspective:

- Rubrics allow advanced knowledge of the criteria used for assessment, allowing learning to be adapted to these criteria.
- They provide constant feedback so that errors can be corrected during the process itself.
- They provide a detailed explanation of the acquisition levels of each component of the competence through various indicators.

Validation

In order to validate the rubric after its design, it underwent an assessment by expert judges, all of them university professors of other subjects, who were asked to explain what they understood each of the designed indicators to mean.

Based on their suggestions, one of the indicators was redrafted, others were removed because they did not correspond to the marked component and others were explained in a greater detail with the aim of making them easier for students to understand.

Moreover, this task was also used to add indicators to some of the elements assessing the competence.

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Students were also assessed on the subject content using a multiple-choice test and the designed rubric. It should be kept in mind that in the multiple-choice test is based on a continuous numerical score while the rubric on a discrete numerical score. But the average of the two techniques was similar since the average for the multiple-choice test was 7.88 and the average for the rubric was 8 among the twelve groups of students.

Conclusions and Discussion

Considering the results obtained, we can conclude that the rubric is valid for evaluating this competence, but it also allows educational evaluations to be made, since students are informed which competence components they have totally mastered and which need improvement.

The assessment is obviously one of the basic components of the teaching-learning process; hence planning is required to do away with improvisation and arbitrariness. Moreover, the assessment should be consistent with the objectives and contents of the course and should measure the level of competence achieved using indicators that are truly related to these skills (Del Moral & Villalustre, 2009).

The use of rubrics allows professors to analyse and reflect on the teaching-learning process, since they are required to determine and agree on the activities and tasks that develop different skills (Sanmartí, 2011), specifically define the assessment of the acquisition level of the learning achieved (Pérez et al., 2008), assess the difficulties that students had during the learning process and establish the progress criteria that every student should take into account (Iglesias et al., 2010).

According to García-Ros (2011) the implementation levels provide a detailed explanation of what the students should do to demonstrate that they had reached a certain level in a certain skill, ability or criterion. For one criterion, different degrees or levels of quality are defined, such as: inadequate, basic, adequate, or excellent. Their main purpose is to make a distinction between good and bad answers, both for assessing the work and providing feedback to the student (Reddy & Andrade, 2010).

In this context, the professor's role will clearly focus on guiding and promoting self-regulated and collaborative learning through the implementation of different methodological and communicative strategies through both virtual and in person classes (Mingorance, 2001).

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EARLY TESTING OF E-EXAMS IN CALCULUS AT UNIVERSITY LEVEL

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Introduction

Having lectured on the MA-128 Calculus course (now MA-154 Mathematics I) at University of Agder (http://www.uia.no) in 2009, it was clear to me that I would make big changes in relation to how the course was presented. In 2009 I took over the course at short notice and did not have any time to change course arrangements from previous years. The earlier scheme was not bad but it was taught in the traditional way (board education, compulsory exercises and assignments). After working with eLearning for more than 10 years through a former project called parAbel (Aas, 2005), I wanted to use and exploit the advantage of PC-tools in the best possible way. I also have good experience in applying computer technology to my teaching. With the election of MyMathLab Global (http://www.MyMathLab.com/global) I have a tool that satisfies most requirements for eLearning. Here I can give students assignments, tests, quizzes and exams. Questions can be randomised, so that students can get a new question if they want to practise more. The test module allows me to give a test that immediately gives students feedback on their scores. I can allow them to take a test again and again with randomised questions, so they can improve their score. Student feedback indicates that this is motivational. Students can also get step-by-step help to solve problems. All in all, I have many opportunities to control the programme so that my students get what I think is best for them. In this paper I will describe the work performed in MyMathLab. I will also comment on the results and whether MyMathLab is a suitable tool for electronic exams on computers, from now on referred to as eExams. Can MyMathLab set the right grade for the students? Will students get a grade on eExams that is appropriate in relation to what they have achieved? Students get access to MyMathLab via an access code provided when purchasing the textbook Calculus: A Complete Course by Adams and Essex, Pearson (http://www.pearsoned.co.uk), but from 2012 our Faculty has a site licence so students get access from us. MyMathLab works just like any other Learning Management System (LMS). I set up the page in a way that gives my students all the important information they need to progress on the course. By entering 'Homework and Tests' students get an overview of what to do. Assignments are either 'Homework', 'Tests' or 'Quiz'. I can choose to randomise these questions so that each student will get the same type of questions with different values. I can also choose different aids allowed to help students solve the problems. As an instructor/lecturer I have many possibilities to tailor-make my own educational setup in

MyMathLab. There are still a lot of options I have not yet had time to try out, since the focus so far has been to implement and try out an eExam. My ultimate goal is to fully implement this assessment system so that exams are taken and graded electronically by the end of 2013. Autumn 2010 to 2012 were used to do the first testing of this system.

Innovation and relevance

My previous research in this area (Brekke, 2009) and (Brekke & Hogstad, 2010) suggests a number of improvements in how to implement the student use of computer-aided programmes and different learning arenas. I have a lot of experience in using computer-aided programs in my teaching so the next step was to let my students also take their exams on computers. Students must be familiar with the tool to be able to complete an online eExam. It was therefore required that they got enough training using MyMathLab. Each week I gave students one set of 'Homework' tasks and one 'Test'. The test was a summary of tasks that were given in the 'Homework'. A large database of different questions makes it easy to pick out the appropriate questions to set as homework, assignments and tests. As an instructor, I can create and build my own questions in Norwegian too. When inside the question editor there are lots of options for creating new questions. MyMathLab gives me a full overview of my students' performances. So then it was time to test out eExam on my course. First I wanted to see if it was possible to grade the result of the exam electronically. This would save me a lot of work since I have more than 400 students on my course. Then I wanted to see if it is possible to handle 400+ students conducting the eExam at the same time on our campus. This was my plan:

- Autumn 2010: test out the eExam on a limited group of students, and compare results of the ordinary grading against electronic grading by MyMathLab.
- Autumn 2011 and 2012: try out the eExam on a large group of students. The main focus here was to see if everything would work; laptops, power supply, wireless network etc.

Results

The most important work in this project is to determine if it is safe to implement online examination on the course MA-154. There is still some work to be done and more data that must be reviewed before any exact conclusion can be made on this but it looks promising. Table 1 shows the number of students, the number of users of MyMathLab and shows median time spent on MyMathLab per student.

Table 1: Registered students and MyMathLab users and median time spent on MyMathLab.

Year	Registered to exam	Sat exam	Sat eExam	Registered MyMatlab	Average total time per student	Total time on course
2010	296	280	14	237	21:52:01	4982:27:57
2011	416	387	279	397	20:23:30	8095:18:30
2012	469	425	329	469	21:51:25	10250:54:25

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As we see, my students spent over 8,000 hours in MyMathLab over the 15 weeks of my course in 2011 and over 10,000 hours in 2012. I think these 20 or more hours per student comes very much on top of those hours they would put into the course if there was no eLearning tool provided to them.

Throughout the semester tests were given each week. In 2010 and 2011 every test was voluntary. In 2012 three digital tests were mandatory. This meant that I was fairly confident that the exam in MyMathLab would go without any serious problems. In 2010, 14 students volunteered to take the eExam in MyMathLab along with their ordinary written exam. This exam took place in a computer lab at campus where we had full control over the computers being used; only the MyMathLab website was open for use at these computers. I had the report showing all scores five minutes after the exam finished. Due to strict exam regulations I cannot make the eExam mandatory at this time. So the main objective was to determine whether we could handle an eExam for such a large group of students. Since use of computer labs was out of the question, students had to use their own laptops. Then we had no control over what they had downloaded in terms of programmes and documents. So it was clear to me that I needed to allow students all written and digital aids during the exam. I also needed a backup plan in case any computers should go down before or during the exam. If this should happen, students would be able to switch to the ordinary written exam. Then each laptop needed a power supply so to solve this challenge we put students into 30 different rooms on campus. This also made it easier to place them in a way so that they could not see another computer screen. Students without their own laptop were put into computer labs. Two main challenges took a lot of investigation and discussion with our technical staff. I wanted to get a secure 'exam' wireless network outside the ordinary student network. With this we could control URLs: that is close down MSN, Facebook, and Skype etc. Uncertain whether this network could cope with that amount of users, we decided that this could not be done at that time, but is something that probably will work next semester. However, even if this network were available, we could not stop students using the ordinary network. We then had to close the ordinary network, and that was not really a good solution since many other people on campus use this. Another difficulty was laptops that have built-in 3G wireless cards. Today you get computers that have a SIM card slot built in, which can reach the internet through 3G. This is beyond our control. A student can also create a mobile hotspot on a mobile phone in a bag or jacket. They could then go online through the wireless web to mobile and then to the internet via 3G. This is also beyond our control. All this considered I chose to let them take their exam on the ordinary wireless network on our campus. We closed down one specific website that solves maths problems but everything else was available for students. We made sure students knew that we could log data traffic but we did not actually do that. We also put out more exam officers than usual and put them behind students and not in front, so that they could monitor their screens. This was to prevent communication between candidates. We will never be 100 % sure that candidates do not cheat. I also prepared my students on what to do at the exam if their computer failed or broke down; there would be no technical support and they just should continue with the ordinary written exam. A few students experienced

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problems with their laptops, mostly due to problems with the flash player needed to run MyMathLab.

After the 2010 exam I chose not to go into MyMathLab to see the score of the eExam as I wanted to see the score from of the ordinary written exam first. The ordinary grading was conducted by one external professor and me. Percentage scores were given to each candidate. The percentage results from the eExams came directly from an exported file from MyMathLab. This file can be exported immediately after the eExam, and if electronic scoring were allowed, be sent directly to the exam office. Table 3 shows the results from the written exam and the eExam from November 2010. Column 2 and 3 are results from the ordinary grading. Column 4 and 5 are results directly from MyMathLab. Not surprisingly, the grades are lower for the eExam; the computer only gives credit for the correct answers, while manual grading also gives some credit for the correct process. This is one of the challenges we face with the eExam. The average deviation was at 8.8 %. 8 of 14 candidates dropped one grade, and one candidate dropped two grades. Further investigation of scores was needed. If we look at candidate 209, the difference between their ordinary score and eExam score was 23.35 %. For candidates 209, 360 and 524, all with a grade C, we see that we have the greatest deviation. This was not unexpected, as these candidates often have many "almost" correct answers and get bonus points for correct procedure. Candidate 454 got an A and had a deviation of 13.45 %, which was more unexpected. To understand why we had this deviation I looked into each answer the candidate made in MyMathlab.

Table 2: Results from the written exam, compared with the eExam, November 2010.

Cand. Number	Results in %	Final grade	Results % eExam	Grade eExam	Difference in %	Refinded Results % eExam	Grade eExam	Difference in %
209	68.85	C	45.5	E	23.35	54.5	D	14.35
241	88.45	B	86.4	B	2.05	86.4	B	2.05
272	25.4	F	24.2	F	1.2	24.2	F	1.2
347	40.95	E	33.3	F	7.65	37.9	E	3.05
360	75.1	C	57.6	D	17.5	71.2	C	3.9
370	68.85	C	63.6	C	5.25	63.6	C	5.25
403	34.65	E	31.8	F	2.85	31.8	F	2.85
406	27.15	F	24.2	F	2.95	24.2	F	2.95
415	100	A	95.5	A	4.5	95.5	A	4.5
435	87.2	B	81.8	B	5.4	81.8	B	5.4
454	98.25	A	84.8	B	13.45	95.5	A	2.75
468	93.7	A	86.4	B	7.3	90.9	A	2.8
469	69.1	C	56.1	D	13	60.6	C	8.5
524	68.1	C	51.5	D	16.6	66.7	C	1.4
Average deviation					8.79			4.35

I then compared these answers with the same question given on the ordinary paper exam. I discovered that some deviation was caused by entering a correct answer from the paper exam wrongly into the eExam. 7 of the candidates had made this mistake. This could be as simple as just an omitted minus sign, or forgetting to square x. There are also several versions of correct answers to a question. I soon discovered that I had not entered all versions of correct answers in the database when I created my own question. I thought it would be interesting to see what

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kind of deviation there would be if candidates had entered the right answer from their paper exam and all the versions of correct answers were entered in the database. So I corrected the candidates' answers in the eExam, so that they matched their paper exam. All correct versions of answers were put in the database and immediately I saw changes in the results. The results after these changes can be seen in column 8, 9 and 10 (Table 4). With these adjustments, we see that the average deviation was halved to only 4.35 %. Again it was candidate number 209 that stands out with a deviation of 14.35 %. There were now only 2 candidates who received one grade lower on the eExam. So with these adjustments, we see that the differences between digital and ordinary scoring are not that great. On this particular exam in November 2010, 35 % was set to pass. At the eExam in 2011, a comparison of grading was not the main issue. I did not put in any effort to divide or rewrite questions so they would fit the eExam, nor did I put in all the correct versions of answers in the database. The standard deviation then was 14.85 %, much larger than the year before. This only proves that if digital scoring should be used, adjustments and "new thinking" in how questions are built need to happen.

It is also interesting to compare results of the annual exam from 2009 up to 2012. I have lectured all four years in the same way. In 2010 I introduced my students to MyMathLab as a tool they could use if they wanted to. Did this have any impact on grades? Figure 1 show the distribution of grades from 2009 to 2012. Here 1 corresponds to grade A and 6 corresponds to grade F.

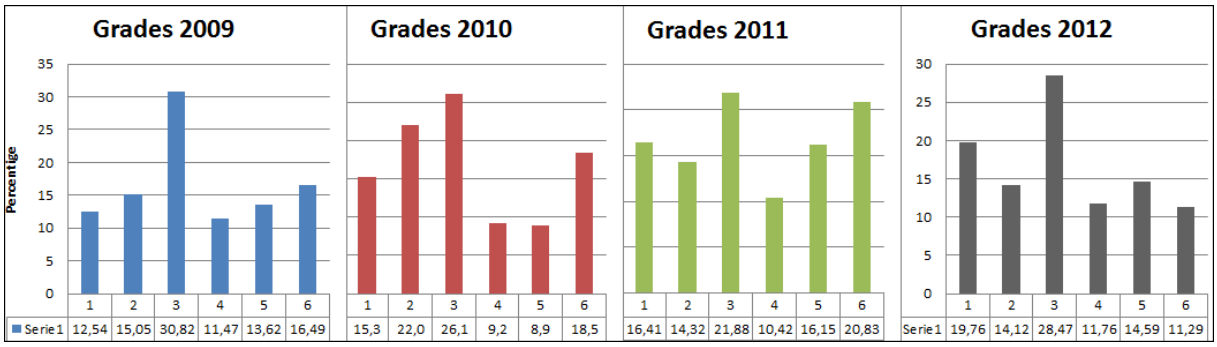

Figure 1. Grades 2009 to 2012

So Figure 1 shows that grades have improved. From 2010 to 2011 and 2012 about 120 extra students took MA-154. These students are what we call "Y-vei" students. These are student with vocational certificates in areas like carpentry, electronics and maintenance technology. They have only a 6 week pre-course in maths over the summer before starting university and the MA-154 course. With this in mind we expected a higher failure percentage, but it was just over 20 % in 2011 and only just over 11 % in 2012, the first year with mandatory tests. I believe more mandatory tests will improve grades, as the student must put more effort in to it.

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Conclusions

Results from these two years of testing eExams using MyMathLab have only given positive results so far. The full potential of MyMathLab is still not used or been investigated. Feedback from students is very positive: they say the tool is challenging and exciting. There were some initial problems regarding registration to MyMathLab and support from Pearson was then needed. This is now solved with a site license for our Faculty, rather than each student registering himself/herself. Results from the eExam taken in 2010 to 2012 indicate that everything is in place to implement an eExam for all students on MA-154 in autumn 2013. Some adjustments are required but there are no major problems that are not resolvable. One other aspect that I have not commented on here, but that is of great interest, is the right for students to appeal and complain about their grade. This needs to be discussed in collaboration with the graduation office. I do not think today's exam rules are updated to also fit digital exams. My experience with MyMathLab has been very positive. Students are happy even though it is in English and not Norwegian (except the questions I have written myself in MyMathLab). There have been very few technical problems throughout and support from Pearson is good. Other positive experiences from users of MyMathLab can be found here: Overview of student results by users of MyMathLab: http://mxlmkt.pearsoncmg.com/student-results.

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THE MEASURABILITY OF EXCELLENCE – THE BUDAPEST BUSINESS SCHOOL MODEL FOR THE ACHIEVEMENT EVALUATION OF PRACTICE-ORIENTED TRAINING

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Introduction

It has become imperative to use well-defined criteria for the evaluation of the achievement of Institutions of Higher Education (IHEs). Obviously, subjective judgment will not do, and exact measuring – as used in physics or chemistry and other natural sciences – can only be applied with certain limitations. Statistical methods, however, can be applied. The authors start this presentation by demonstrating how important statistics can be wherever we are faced with (and might be misled by) data and conclusions drawn from them.

The authors give an overall picture of the latest developments in Hungarian Higher Education, and, specifically, how they affect their school, the Budapest Business School (BBS) at different levels and forms of training. BBS, with about 20 000 students, is the largest business school in Hungary.

In the second part of the paper, they examine the market value of useful and practical knowledge, emphasising the difficulties of quantifying. They provide a model that could be applied to set measurable standards for the evaluation of IHEs concentrating on practice oriented training.

Statistics as a means of measurement

The 21st century is building a society based on knowledge. The concept of knowledge-based economy has frequently appeared in recent business publications. This is typically characterised by the accelerated flow of information, the linkage between business and science, and the increasing importance of knowledge. Higher education as part of all social systems is the flagship of knowledge transfer. Whenever we want to assess its accomplishments, we will have to choose the appropriate measurement tools, which will always include statistical elements.

Thinking statistically and understanding stochastic processes have become universally acceptable. Some statistical indicators are widely used in everyday speech, such as GDP, consumer price index, employment rate, national debt, and so on. Such statistical indicators

are also used for evaluating the achievement of IHEs, too, and problems are often discussed in a new language – the language of numbers, or more precisely statistics.

When people quote what British Prime Minister Benjamin Disraeli (1804-81) allegedly said about statistics: "There are three kinds of lies: lies, damned lies and statistics", we have to bear in mind that it is not the numbers that lie, but their interpretation is wrong, incorrect, or perhaps an important point has been neglected or overlooked in the analysis, or the cause that caused the event was ignored.

To understand the language of statistics means we must be able to read and write correctly in this language if we want to communicate clearly and effectively. To make subjective judgements about anything is easy but you can hardly rely on them. If you say, for example, that country X has too many theatres (or hospitals, or shopping malls, or swimming pools or whatever) is a subjective statement. If you corroborate this statement with statistical data – i.e. you give the number of theatres – you may feel that you have proved your statement. That is false. Mere data do not mean much. They have to be interpreted. The number of, say, theatres could be compared to the number of population, the cultural tradition of the country, city, region or area. But that might be insufficient. You should take into consideration the size of the theatres, the cultural role they perform, the attendance, etc, quite a few of other factors. If you only know that a country has 20 universities, it only means that much. You don't know if this is too large a number or too small. Furthermore, even if many supplementary data are available about those universities, and you know the size of the particular country or region in which there are, you learn facts and figures about the people who live there: these are only data. Statistics is much more than a collection of data. Being able to read statistics is a broad concept and includes the skill of probing what may be hidden behind the numbers and realising that there are no "absolutely reliable" figures.

We have to bear in mind all that when we deal with the issues of higher education. And indeed, the more information we are receiving (as is the case in a digital world) the more competencies are needed and the more circumspection is required to understand and analyse the wealth of data available.

A few facts and the latest developments of Hungarian Higher Education

Hungarian higher education is in a transitional state. A new *National Law on Higher Education* was adopted a little more than a year ago, which means that some new regulations have since been introduced, but some issues seem to be still unresolved. Most of the unresolved issues are closely connected with how to finance higher education, but there are a few more.

Funding higher education is, of course, a problem in most countries, we can only think of a few favourable exceptions. Due to several reasons, government support for higher education has been falling as shown in Table 1.

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Table 1: Government Financing of the Hungarian Higher Education

Year	**2008**	**2010**	**2012**	**2013**
Amount (Billion HUF)	191	200	157	134

We should add to that that the enrolment figures have remained practically stable but expenses have been slightly increasing, by about 3 or 5 percent each year. The reasons for the cuts in government support are due to several reasons: one is the government's budget deficit, which should, of course, be reduced; another is the government's educational philosophy, which envisions a self-supporting system of higher education. There are other reasons, too, of which another important one is a frequently voiced opinion about the excessively large number of IHEs in Hungary. On the face of it the results seem good. On the face of it that might seem true. 66 IHEs in a country with a population of 10 million might be too numerous. Let's look at the statistical data on Table 2.

Table 2: The System and Structure of Hungarian Higher Education

State-run institutions		**Church-run and Private Institutions**			
		Church-run		Private	
Universities	Colleges	Universities	Colleges	Universities	Colleges
19	9	5	20	2	11
28		38 (7 Universities and 31 Colleges)			
Total number of Institutes of Higher Education in Hungary					**66**

If you consider that less than one third of the IHEs are state-run and that some of the remaining 47 institutions are very small church-run colleges performing important functions of training clergymen for their respective denominations, you will have to admit that the number of IHEs in not that high. You must also allow for the fact that not all kind of university programs can equally be cost effective. Giving lectures in philosophy, mathematics or literature is more "cost effective" than teaching violinists (or players of any other musical instrument) in that a lecture can be given to hundreds of student individually but music can only be taught individually. That does not mean, however, that there are state-run institutions that could be reorganized in a more efficient way. Let's bear in mind that Hungarian higher education a little more than two decades ago was a highly centralised state-controlled system, and since the early 1990's it has been going through continuous reorganisation. One more point should be considered: hitherto a constant increase of enrolment in higher education has been encouraged, since our country was regarded as lagging behind some other European countries in the number of college/university graduates. Now many people (including the government) think that there are certain academic programmes that are "exceedingly popular", which results in a high number of graduates who cannot find jobs after completing their studies. The perfectly legitimate question may be asked whether the taxpayers should sponsor dubiously useful studies. Furthermore, one can as who it is possible to maintain high standards of education with a growing number of students. The complicated web of funding, subsidising higher education, maintaining and even improving standards, meeting the needs

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of the labour market, ensuring appropriate jobs for the graduates, serving the interests of students, their parents and the general public, completing the mission of higher education that is not restricted to knowledge transfer but extends to cultural obligations and the advancement of science, – all that raises problems that are very difficult to address. Since they concern the interests of so many people, they may easily lead to conflicts. While you are trying to solve one the problems, you may create other ones. You want to cut costs and the quality of your training may suffer. You want to transfer more scientific knowledge to your students and the employers may complain that the graduates have not received enough practical training.

We are aware these issues are well-known in all the IHEs around the world perhaps with the exception of the richest ones. The scope of this paper does not allow us to address each of the questions raised. We will have to concentrate on a few specific ones. The new Hungarian National Law on Higher Education has, among other things, defined the types and responsibilities of the various types of IHE. It makes a distinction between universities and research universities and colleges and colleges of applied research. Like research universities, colleges of applied research stand out among other IHEs as the ones that are the most interested in the advancement of science besides transferring knowledge. To be a research mean excellence in research and to be a college of applied research means excellence in applying the results of research. Universities are naturally concerned with more theory and colleges with more practice.

How to make a distinction between a college and a college of applied research is not very easy. In this paper we want to point out model that – with the use of a few criteria – could be applied to make such a distinction.

A model for the evaluation of practice oriented training

The most important task of higher education can perhaps be defined as generating functional knowledge to be utilised in the economy and to provide for other needs of the society and subsequently pass on this knowledge to the students. That is why Budapest Business School has chosen this motto: *We want to provide our students with useful knowledge*. Being the largest college in Hungary and having a record of ranking and evaluation made by Hungarian periodicals and business papers, BBS may qualify as a good example of a college of applied research. They are, obviously, subjective judgments, which we are understandably proud of. All the more so since some objective indicators – such as the fact that we have always had quite a number of students of applying for admission and our graduates have never had any difficulty in finding jobs. As the name implies, BBS, as a business school, stands out as a school that offers a large number of business programs in different languages. At present, these are the BA/BSc programs offered by the BBS: Andragogy, Business Management, Business Information Technology, Commerce and Marketing, Communication and Media Studies, Finance and Accounting, Human Resource Management, International Business Economics, International Relations, Public Service, Teacher Training, Tourism and Catering. And these are the Master's programs: Accounting, Finance, International Relations,

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Marketing, Teacher Training, Tourism Management. Some of our programs are offered in English, German and French. Besides full time students, we teach part-times students and offer a range of distance learning programs.

Still, we thought it might be worth trying to prepare a model that could be applied to set measurable standards for the evaluation of schools concentrating on practice oriented training. We are aware that the economy, society, knowledge and human life in general are made up of complex processes, a fact which makes accurate measurement impossible. As is well known, practical methods of evaluation may be separated in different groups. Besides the better known quantitative methods, qualitative methods are also distinguished. In physical sciences, almost exclusively quantitative methods are applied, and since they are more easily understood, analysed and interpreted, they are preferred whenever criteria can objectively be quantified. In other branches of study, including business studies, the use of qualitative methods may also become necessary. Quantitative methods are either exact measurements or measurements used on statistical probabilities. Sometimes it may be difficult to tell quantitative and qualitative methods apart. The number of publications, for example, seems to be an objective criterion. But without taking the value of the publications into consideration, the mere number of publishes papers does not mean too much. Looking at the citations may add value to the simple data of publications.

When achievements of IHEs are evaluated, which is often done when ranking of those institutions is made, usually indictors are chosen. The choice of indicators is always somewhat arbitrary, which explains why the rankings are usually different when made in different surveys. (The best surveys always indicate the methodology used.)

What are the usual indicators? Here is a typical list of a few frequently used criteria of evaluation:

- Size of the IHE:
  - Number of students (enrolment data displayed in various ways)
  - Number of professors and staff
  - Number of programs offered
- Achievement of the IHE:
  - Annual figures of graduates
  - Number of faculty publications
  - Citation index
  - Data of Research and Development (R+D) projects
  - Data of innovation, inventions, patents and other registered rights
- Quality Indicators:
  - Qualifications of faculty
  - Presence in international professional organisations
  - Citation index

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– Data of Research and Development (R+D) projects

The above list is not a full list of all the possible criteria used in the evaluation of IHEs. The following list is comparing the criteria used in the evaluation of the excellence of academic research made by research universities (left-hand column) and the proposed criteria to be used in the evaluation of colleges of applied research (Table 3).

Table 3: Comparison of the Most Important Indicators of Academic Excellence and Practice-oriented Training

Indicators of academic excellence	**Indicators of practice-oriented higher education**
1. Research Capacity Qualification of Faculty (Proportion of Teaching Staff with Doctor's Degrees) Management of talented students Membership in accredited specialized Colleges Research Capacity (Support Staff and Equipment) Domestic and international academic connections Membership in professional periodicals Membership in professional organizations Number of professional awards	**1. Research and Development** Qualification of Faculty (with regard to publications) Number of new and updated teaching materials Number of joint research programs (with domestic and/or foreign partners) Number of current research projects International connections
2. Productivity of Research Number of publications Citation index Proportion of income from R+D activities to that of operating income Funds obtained for R+D projects Outstanding student's performance	**2. Labour-Market Achievement** Number of graduates finding jobs after graduation Number of placements per 100 students Number of visiting instructors Number of cooperation agreements with the business community, government bodies an non profit
3. Utilization of R+D an innovation achievements Number of registered patents, exclusive rights, and know-how contracts and Income form R+D and innovation activities Organizations promoting bonds between higher education and business community for knowledge and technology transfer	**3. Capacity for Quality Training** Offering Bachelor's programs in at least three branches of learning Offering at least 5 full programs in foreign languages Offering Master's programs in at least three branches of learning Adequate qualification of professors teaching Master's programs Number of students preparing professional papers
	4. Extensive international relations Membership in international professional organizations Number of agreements with international partners Agreements with at least two IHEs toward double degrees

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Conclusion

Higher education can only meet the expectations of society if these expectations are well defined. It is the responsibility of the respective government authorities, the professional accrediting bodies, and, of course, the IHEs themselves to define these expectations. The general public – i.e. the society including the employers (the "users of the products of higher education" – can pass judgement about their satisfaction through different channels: the media, civil organisations, employers organizations and professional bodies.

It is essential, however, for universities and colleges to gauge their own performance by constantly evaluating their own achievements. They have to improve continuously the quality of education and research in their institutions to survive in an increasingly competitive environment.

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LEARNING BY REMIXING: ASSESSING STUDENTS DESIGN OF MEANING IN THEIR DIGITAL RESPONSES TO ACADEMIC PROBLEMS

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Introduction

Situated within the sociocultural perspective on teaching and learning (e.g., Vygotsky, 1978; Wertsch, 1991) this study draws on theories of multimodality, social semiotic, mediated discourse, new media and remix culture to investigate the multimodal interactions in year 8 science students design of meaning in their digital multimodal responses to academic problems using the web. The purpose of this study is to design, test and evaluate a "learning by remixing" learning environment to support the students' learning of scientific concepts and development of multimodal literacy practices within the scientific semiotic knowledge domain. And the aim is to develop a pedagogical model for learning by remixing which supports the students' development of multimodal literacy for knowledge construction in the new media age. This paper investigates the types of multimodal interactions the students remix using the modalities they have available on the web in their design of meaning in their digital responses to academic problems. The objective is to propose a multimodal interactions framework for assessing students' design of meaning in multimodal digital artefacts.

The World Wide Web (web) has evolved into a multimodal, interactive, visual and aural experience. The techniques of previously separate media have been united in a common new media environment and the manipulation and construction require knowledge of visual, aural, and interactive conventions (Manovich, 2001). We now live in a networked knowledge society where the web has grown into an essential medium for communication, socialization, and creative expression. In March 2011 the web population was 6,930,055,154 (Web World Stats: Usage and Population Statistics, 2011). In the history of literacy, no other technology for reading, writing, and communication has been adopted by so many in such a short period of time. In this "digital culture" (Deuze, 2006) the possibilities for the manipulation of text, images, video, and audio files have increased dramatically, and our students live in a world filled with self-authored, customized, and on-demand content, much of which is easily replicated, manipulated, and redistributable (Hughes & Lang, 2006). The web and computational media have given them the tools to create, remix, and share content on a scale that had previously only been accessible to the professional gatekeepers of broadcast, print, and recorded media outlets. According to Lenhart and Madden (2005) 50 % of all American

teens are active "content creators". "Content creators are teens who have created or worked on a blog or web page, shared original creative content, or remixed content they found online into a new creation." (p. 1). These content creators, no longer passive receptors of content, take on the role of producers; they re-use and remix the existing store of knowledge and culture to produce their own social and creative innovation, producing a new dimension of creativity. According to Jenkins (2006) contemporary creativity is no longer focused towards creating original content but is a practice of rip, mix and burn, where content is taken, appropriated, adapted, mixed, and distributed in a way in which consumption of media and information become a productive act of remixing, transforming and creating new content from various sources. As Lessig (2008), Manovich (2007) and others states, we now inhabit a "digital remix culture".

Literaturereview

> *"Remix means to take cultural artifacts and combine and manipulate them into new kinds of creative blends" Knobel & Lankshear*

This study focus on learning with web resources and developing the literacies to engage with employing higher order thinking skills and multimodal literacy to remix with content on the web into representations of learning by problem solving. The literacies needed in this networked knowledge society must include both digital images and digital language. Language and images are integral to the texts we use. As well as making meanings separately, language and images combine to make new meanings as multimodal texts. In this literature review I review research on learning with the web and I present the concept of multimodal literacy.

Learning with the web

Researchers in both the field of library and information Science and the field of educational research have investigated middle school students' use of web information resources. A few studies have sought to link the use of web resources available on the open-ended web within a curriculum context (e.g., Lyons, Hoffman, Krajcik & Soloway, 1997; Wallace, Kupperman, Krajcik & Soloway, 2002; Hoffman, Wu, Krajcik and Soloway, 2003). These studies have reported a mismatch between the intended outcome of the project and the actual outcome with students focusing only on part of the processes required for a complete project solution. For example, Wallace and colleagues (2000) reported that sixth-grade students spent considerable time searching a digital library at the expense of other web inquiry activities. Rather than exploring websites that they found, students would continue to develop search keywords that would return a smaller number of websites without considering the quality of those search results. The students invested most of their time searching for a website with the "correct answer" rather than evaluating the resources found for their suitability to design a response to the task. Frequently students generate search terms that were either too general, too specific, or that did not match their inquiry questions (Abbas, Norris & Soloway, 2002). Hoffman, Wu, Krajcik and Soloway (2003) noted that when students evaluated a website, they

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focused on the website's title or visual appearance instead of engaging in analysis of the website's content. Research has also reported that synthesizing from multiple sources of information is a challenging task for learners (Dreher, 1995), with students often copying fragmented facts and sentences from websites that were sometimes irrelevant to their research question (Hoffman, 1999). Smith and Oliver (2004) investigated digital literacy from an educational perspective. The researchers found that digital literacy is a highly situated practice which remains undeveloped through mandatory schooling; hence, developing higher-level digital literate attitudes is likely to be an iterative and contextualized process. Hence, based on Kuiper, Volman and Terwel, (2005) review of research on the use of web for teaching and learning they argue that more research is needed in order to develop meaningful learning with web resources with more investigations into what kind of learning processes and learning outcomes designs of learning with the use of web resources can enable. Kuiper, Volman and Terwel (2008; 2009) have after that conducted studies on the possibility for students to acquire web literacy skills and learn content knowledge using the web in collaborative web activities. Their results show that the students had problem with constructing adequate research questions and their inquiry skills. And the teachers' teaching styles influenced the success of learning goals. The purpose of their studies have been investigation into developing educational program with the use of the web in an academic context, however, the research is still too limited and need to go beyond purely looking descriptively at web literacy and learning of subject content. They did not investigate the processes or strategies the students use as they work through the task in detail, such as their use of multimodal literacy practices in their construction of their responses to academic tasks. Thus, the research lack studies investigating students construction of responses to the learning tasks and how they engage with using semiotic modes from the web to create representations of knowledge in their artefact. Hence, the aim of this study is to contribute to this research area by:

- identifying the multimodal interactions the students construct in their design of representational meaning in their digital artefact.

The concept of multimodal literacy

Developed primarily on conceptions on meaning-making in social semiotic, multimodal literacy is a term first coined by Jewitt and Kress (2003) to encompass all the different ways in which meaning can be created and communicated in the world today. Social semiotic is "primarily concerned with human semiosis as an inherently social phenomenon; moreover, it is concerned with the full range of semiotic forms…semiotic texts and semiotic practices" (Hodge & Kress, 1988, p.261). Social semiotics has increasingly viewed semiosis, the social production of systems with signs and meanings, as a "multimodal" phenomenon (Kress, 2000; Lemke, 1998). From the perspective of multimodality all modes, not only those of speech and writing, have specific parts to play in the making of meaning (Kress, 2003). Kress and Van Leeuwen (2001) define multimodality as "the use of several semiotic modes in the design of a semiotic product or event, together with the particular way in which these modes are combined." (p. 20). Modes are elements for meaning making and are part of our semiotic

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landscape. Kress (2001) defines modes as: "semiotic resources which allow the simultaneous realization of discourses and types of (inter)action." (p. 22). In social semiotics, as opposed to semiotics and linguistic, the idea of sign-use is replaced with sign-making, which is a move away from the conventionally accepted view that there are (relatively) stable signs used in representation and communication. Instead signs are seen as constantly newly made, out of the interest of the socially and culturally formed and positioned individual sign-maker. The process of outward meaning-making has a transformative effect (Kress, 2003): the sign-maker's resources have been changed, because the sign made outwardly is a new sign; the inner transformations produce learning, and learning is the shaping of the subjectivity of the maker of the signs. The outward transformations produce new syntactic, textual forms, which play their roles in the change of resources that were used in meaning making. This is how semiotic and cultural change happens – whether in a change to writing, to speech, or to gesture; it is also the way in which semiotics change, the change in the modal resources, always reflecting and tracking the values, structures, meanings of the social and cultural world of the meaning-maker; and it is the way in which engagement in these processes constantly transforms the subjectivity of the maker of the signs. In order to understand and describe multimodal design of meaning and multimodal literacy, we need to understand processes of integration and composition of various modes; both in production and making and in consumption and reading (Hull & Nelson, 2005). According to Kress (2003), a theory of multimodal literacy must account for the accordant, complementary processes of transformation and transduction as the locus of creativity in multimodal designs of meaning. Kress's (2003) theoretical formulation identified the co-operation of transformation, which "operates on the forms and structures within a mode," and transduction, which "accounts for the shift of semiotic material…across modes" (p. 36) as the mechanism of the emergence of meaning. Together, Kress (2003) argues that these processes form the engine that drives the psychological machinery of synaesthesia, the emergent creation of qualitatively new forms of meaning as a result of shifting ideas across semiotic modes. Kress's (2003) semiotic adaptation of the term synaesthesia refers to:

> *"…a process of emergence, where meanings presented in two or more co-present semiotic modes, e.g. the visual/pictorial and oral/linguistic, combine in such a way that new forms of meaning may obtain, in the (loosely) gestalt sense of a whole that is irreducible to and represents more than the sum of its parts." (Kress, 2003, p.59, cited in Hull & Nelson, 2005).*

Representation is never neutral. That which is represented in the sign, or in sign complexes, realizes the interests, the perspectives, the position and values of those who make signs. The outward sign functions in communication, and so it must fit into the necessary structures that characterize the situations of communication (Kress, 2003). In its forms, the sign must factor that in as well; it must be fit for its role in the social field of communication or what Gee (2002) refer to as the semiotic domain:

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> *"A semiotic domain recruits one or more modalities (e.g., oral or written language, images, equations, symbols, sounds, gestures, graphs, artifacts, and so forth) to communicate distinctive types of messages. Any semiotic domain has what I will call a "design grammar"… By this I mean a set of principles or patterns in terms of which materials in the domain are combined to communicate complex meanings." (p. 23)*

In describing how a combination of semiotic resources is apt for their purpose, Kress (2003) adopted the notion of "affordances" from Gibson (1977) and used it to reference the fit between a semiotic resource, with its inherent properties of organization, and the meaning-making at hand. This is to say that pictures do not convey meaning in the same way as language does, thus their respective meaning making affordances are different.

Modes have materiality; and that materiality leads to potentials for making meaning: "the material of sound in speech…of graphic and light in image, holds special potentials for representations, and at the same time brings certain limitations" (Kress, 2003, p.45). The affordances of modes are always the product of the material and its inherent logics. The students in the current study are using the web for learning and develop their multimodal literacy with the access to a huge amount of semiotic resources. They have the opportunity to read, interpret and select these resources to learn, they can sample and remix them into new meanings by transforming the resources and/or transduce meaning across resources and they can employ and structure multiple modalities such that affordances of them are utilized apt for communicating in a "science way". Thus, the research questions for this enactment and evaluation intervention study is:

- What kinds of multimodal interactions do the students remix in their design of representational meaning in their digital artefact as their responses to the academic problems?

In this study a learning by remixing pedagogical model is used to frame the analytical lens and as a scaffold to support the intervention design.

Learning by remixing

The learning by remixing pedagogical model is conceptualized by drawing on Manovich's (2001) sampling, selection, and compositing as "cultural digital operations" in the new media age, Hughes and Lang (2006) theoretical framework for digital remixing including rip, mix and burn activities: 1) ripping as de-contextualization; 2) mixing as manipulation; and 3) burning as re-contextualization to produce a new digital remix (p. 7). Kress's (2003) argument that the processes of transformation and transduction are central in a theory of multimodal literacy, Navas (2012) definitions of different approaches to remixing artefacts within art: 1) selective remixing; 2) extended remixing; and 3) reflexive remixing and Unsworth and Cleirigh (2012) framework for multimodal interactions in design of representational meaning

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with image-text and image-text configurations: 1) possessive; 2) intensive; and 3) circumstantial.

To classify and interpret the learning by remixing mediated actions that the students engaged in I adapt from these theories/models the pedagogical model for *learning by remixing* for this study to include: 1) *Ripping* as de-contextualizing content by selecting and sampling modalities from discourses for knowledge building; 2) *Mixing* as manipulation of semiotic resources by rearrangement, modification, or extension of the modalities and selection of pre-defined manipulative actions and objects found in libraries and menus in production tool; and 3) *Burning* as composing designs of meaning by re-contextualizing with transformation and transduction of modalities within the context of the learning task given. This paper focus on the third part – *Burning* as composing designs of meaning by re-contextualizing with transformation and transduction and the multimodal interactions the students construct in their design of the response to the task. To identify the multimodal interactions the students created I use Unsworth and Cleirigh (2012) framework for multimodal interactions and I draw on Navas (2012) work with conceptualizing different approaches to remixing within the arts as I define the remixing mediated actions the students engage in as they create multimodal interactions.

Research design & methods

Guided by the principles of "design experimentation" (e.g., Brown, 1992; Bannan-Ritland, 2003) the present study adopts an "interventionist" approach to: "design, test and evaluate a "learning by remixing" pedagogical approach to support the students' learning of scientific concepts and development of multimodal literacy practices within the science discipline. Design experimentation addresses problems through designing a solution and aim at determining how the design of learning environments contributes to learning (Brown, 1997). Design experiments are types of research that place educational experiments in real-world settings to find out what works in practice. The study adopts Banna-Ritand's (2003) model for design-based research. The first step in Bannan-Ritland's (2003) design experiment model is an informed exploration study. This was conducted to identify important design elements for the learning environment (Brudvik, Tiu, Hedberg & Freebody, submitted). This second step in Bannan-Ritland's (2003) design experiment model is an enactment and evaluation study which was conducted with a four repeated measures design conducted over a period of four months with four problem-based learning tasks.

Sampling of participants

The sampling of participants for the enactment and evaluation study was purposively made (Miles & Huberman, 1994) by selecting one science class for this research study that the teacher had participated in the DCL study by Freebody, Hedberg & Guo (2003; 2005). The 38 students were randomly put in pairs to collaborate and 4 of the pairs where followed more in depth with video and audio methods of data collection.

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Data collection & analysis – Videography

Qualitative video research methods were used to collect, code and analyse the data for the four learning tasks. The data was collected by producing a video by recording each of the 4 pair's computer screen synchronized with audio recordings of their dialogue and the teacher talk. The videos were coded and analysed with Transana software for qualitative analysis of video data. To answer the research question in this enactment and evaluation study, Transana was used to identify the multimodal interactions the students remixed in their design of meaning in their digital artefacts as their response to the academic problems. The data from the enactment and evaluation study from the four student pairs was coded and analysed to classify and describe the mediated actions the different pairs engaged in as they created multimodal interactions in their design of meaning. In the first and last task the students were given no support in order to act as the study's pre and post comparison tasks. The pairs were each using one computer during the four learning tasks. Multimodal mediated discourse analysis (Norris & Jones, 2005) was used to code and interpret the video and dialogues of the students work. The student pairs anticipatory and emanation (Scollon, 2001) points in their mediated discourse was used to classify and describe the mediated actions (Wertsch, 1991). The mediated actions transformation and transduction (Kress, 2003) were classified as working with creating a textual mode and working with creating visual modes. I adopted (Unsworth & Cleirigh, 2012) framework for constructing representational meaning (Lemke, 1998) through image-text interaction to identify the multimodal interactions the students created with their work with creating text and visual modes to construct the science content in their response to the academic problem task in their digital artefact.

The enactment and evaluation study – Learning by remixing intervention

Four problem-based tasks were designed as tasks from the current curriculum topic at the time of the start of each of the tasks. In the pre-intervention comparison task the students were given only task and had 1 hour to complete the task. They could only use the web for learning. Distributed scaffolding (Tabak, 2006) was designed based on previous findings from studies investigating the challenges with learning with the web, the results from the informed exploration study and the pre-intervention learning task. In tasks 2 and 3, the intervention with distributed scaffolding was implemented. Both the two intervention learning tasks lasted for 2 hours each. The distributed scaffolding was gradually faded away in learning task 3 and in task 4 no support was given. In task 4 the students had 1 hour to complete the task. In this way task 4 was the post-intervention comparison task.

The distributed scaffolding (Tabak, 2006) was implemented to assist all the students to learn by remixing with hard scaffolding: 1) argumentation template with sentence openers; 2) a step by step inquiry guideline template with written prompts. And soft scaffolding: 1) modelling and question prompting were utilized. By synchronizing the scaffolds it was meant to address all the students' different learning needs during the duration of the task. Before the first 1 hour lesson for learning task 2 a 30 minutes Internet literacy think-aloud modelling intervention

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was conducted and before the second 1 hour lesson for learning task 2 a 30 minutes multimodal literacy think-aloud modelling intervention was conducted. Task 2 and 3 was started with the teacher contextualizing the task with talk-aloud modelling and question prompting the students understanding of the task so that all the students had a shared understanding of the problem-based task. The teacher think-aloud modelled web searching focusing on finding potentially relevant sources, evaluating the appropriateness of the search results, the authority of the sources and searching for relevant content in the source. During task 2 and 3 the facilitator conducted regularly "pin-up" sessions question prompting the students in order to synchronize the scaffolding of the progression and completion of the task. Figure 1 shows the structure of this intervention study with 4 problem-based academic tasks.

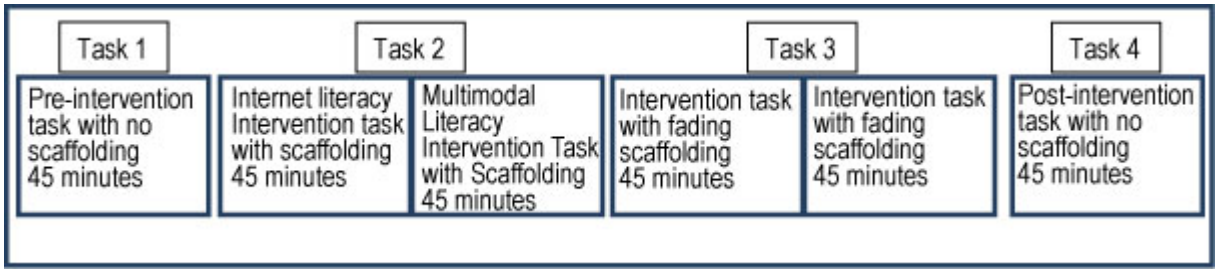

Figure 1. Structure of the Intervention Study

The design of the problem-based learning tasks adopted Manninen et al. (2000) innovative socio-constructivist pedagogic design. The criteria for their design of tasks are: Constructiveness, Activeness, Cooperativeness, Contextualised and Problem based. Figure 2 shows one of the five learning tasks. The teacher designed the first pre-intervention task and the researcher and the teacher designed the remaining four tasks jointly. The students were required to produce their digital artefact as a poster with MS PowerPoint; the students were familiar with MS PowerPoint so there was no need for extra training in using the production tool.

A friend of yours comes to you crying, explaining that she had just witnessed a horrible death… She had just bought a pair of goldfish for her father on his birthday and when she placed them into the aquarium, she saw them shrink and die! After calming her down, you manage to find out from her that her father is a marine-fish lover and she had bought the goldfish from a freshwater aquarium. Being the curious investigator, your pathologist instincts pick up the clues. You assure your friend that you can explain to her what had happened to her goldfish. Investigate and explain the mysterious and tragic death of the goldfish. Predict also what would happen to a saltwater/marine fish that is put in fresh water. Your answer should be designed into a poster(s), not more than 3 slides, using Microsoft PowerPoint.

Figure 2. Example Problem-based Learning Task

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Results

This section presents the findings from the study within the frame of stage 3 of the learning by remixing model – Burning. In this paper I investigate the multimodal interactions the students created in their artefacts. Using Unsworth and Cleirigh (2012) model for image-text interaction Table 1 shows the different multimodal interactions the students created in their digital artefact per task. The circumstantial interaction Unsworth and Cleirigh (2012) defined as an intermodal identification the image visualizes, show or demonstrate locations, manner: quality and causal-conditional: result, reason, condition or consequences. The possessive interaction visualizes additional things that is not verbalized but contribute to the representational meaning. The intensive interaction visualizes the qualities: such as shape, texture, and colour (p. 156-157).

Table 1: Multimodal Interactions in the Digital Artefact per Task

Multimodal Interaction	**Task 1**	**Task 2**	**Task 3**	**Task 4**	**Total**
Circumstantial Interaction	0	13	7	5	**25**
Possessive Interaction	0	6	7	5	**18**
Intensive Interactions	2	12	7	5	**26**
Total:	**2**	**31**	**21**	**15**	**69**

Totally the student pairs created 69 multimodal interactions. Only two of them in the pre-intervention task but after the multimodal literacy intervention in task 2 they created 31 and 21 and 15 in task 3 and 4 respectively.

There are lower and higher level mediated actions (Norris & Jones, 2005) and a higher-level mediated action can include several lower-level mediated actions. The Burning higher-level mediated action the students engaged in this study was the transformation and transduction remixing activities that created and realised the multimodal interactions with text configurations and image and image-text configurations. Table 2 presents and defines the different transformation and transduction higher-level mediated actions the students employed in their work on the learning tasks.

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Table 2: Remixing Designs of Meaning – Students Mediated Actions

Learning by Remixing Activity	**Mediated Action**	**Definition of Multimodal Interaction**
Burning *as the compositing of designs of meaning by re-contextualizing content through transformation and transduction of modalities within the context of the learning task given.*	Transformation Selective Remix	Remixing that "takes and adds parts to the original composition, while leaving its spectacular aura intact...there is subtraction and addition (selectively – hence the term, Selective Remixes)." (Navas, 2012, forthcoming)
	Transformation Extended Remix	Remixing "a longer version of the original…" (Navas, 2012, forthcoming)
	Transformation Reflexive Remix	Remixing that "allegories and extends the aesthetic of sampling, where the remixed version challenges the aura of the original and claims autonomy even when it carries the name of the original; material is added or deleted, but the original tracks are largely left intact to be recognisable...In culture at large, the Reflexive Remix takes parts from different sources and mixes them aiming for autonomy." (Navas, 2012, np)
	Transduction Selective Remix	Remixing that select, sample and mix a visual or textual mode that visualizes or explain/describe a part of a configuration of visual or textual modes.
	Transduction Extended Remix	Remixing that select, sample and mix a visual or textual configuration of modes that visualize or explain a textual or visual content configuration.
	Transduction Reflexive Remix	Remixing that "allegories and extends the aesthetic of sampling, where the remixed version challenges the aura of the original and claims autonomy even when it carries the name of the original; material is added or deleted, but the original tracks are largely left intact to be recognisable...In culture at large, the Reflexive Remix takes parts from different sources and mixes them aiming for autonomy." (Navas, 2012, np)

It is beyond the scope of this paper to present in detail these higher-level mediated actions. However, in the presentation of this paper this will be done.

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Discussion & conclusion

One of the goals of this study was that the students would be able to complete such a learning by remixing task within one school lesson (45 min.) and engage in the transformation and transduction Burning mediated actions to design representational multimodal interactions in their digital responses to academic problems. In the pre-intervention task 1 none of the pairs were able to complete the task and only 2 multimodal interactions where designed while in the post-intervention task all the student pairs were able to do this. In the focus group interviews the students confirmed what the most challenging and valuable they learned was to de-contextualize the information through *Mixing semiotic resources from multiple resources* and *Burning a re-contextualized response to the task.* After the intervention they had developed their multimodal literacy and internet literacy skills and were *efficient at finding, evaluating, selecting and sampling semiotic resources for mixing and burning multimodal digital remix artefacts.* Findings from questionnaire and focus groups conducted with the students showed that they experienced that the intervention developed their skills to use the web for learning by remixing. A frequent response was that "learning and understanding the structure and processes enabled them to better use the web for learning this way", which indicates that they engaged in higher-order thinking skills. Hence, the learning by remixing approach is a potential pedagogy for the current and future generation of students and it also provides connections to their new media practices in their personal and social life.

Figure 3 and Figure 4 illustrates which multimodal interactions one of the student pair designed and which transformation and transduction mediated actions (vertical) the student pair engaged in during their work on the pre- and post-intervention task. How much time they spent and when during the task is represented with the horizontal bars. In the pre-intervention task they spent most of their time on creating the text in the artefact and they did not design any representational multimodal interactions. Whereas in the post-intervention task they employed all the three text remixing approaches and they designed all the three multimodal interactions.

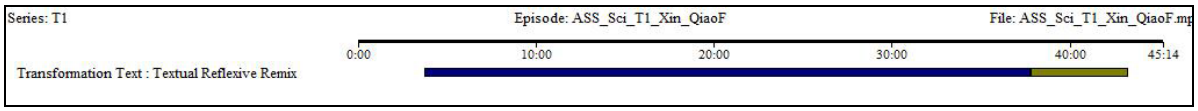

Figure 3. Student Pair 1 Design of Representational Meaning Task 1

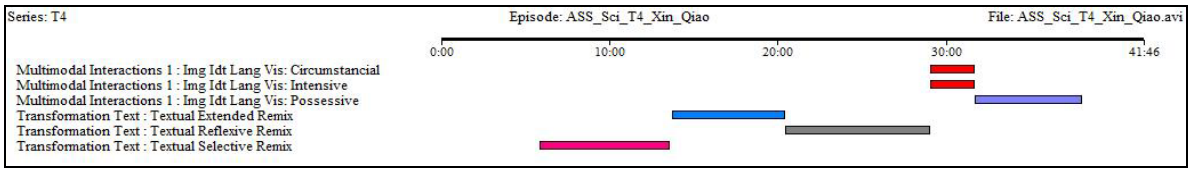

Figure 4. Student Pair 1 Design of Representational Meaning Task 4

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Figure 5 show their artefacts from both the pre- and post-intervention task. The later one employing more modalities then the first, hence, after the intervention the students were able to create a multimodal response to the academic problem using no more than one lesson of 45 minutes.

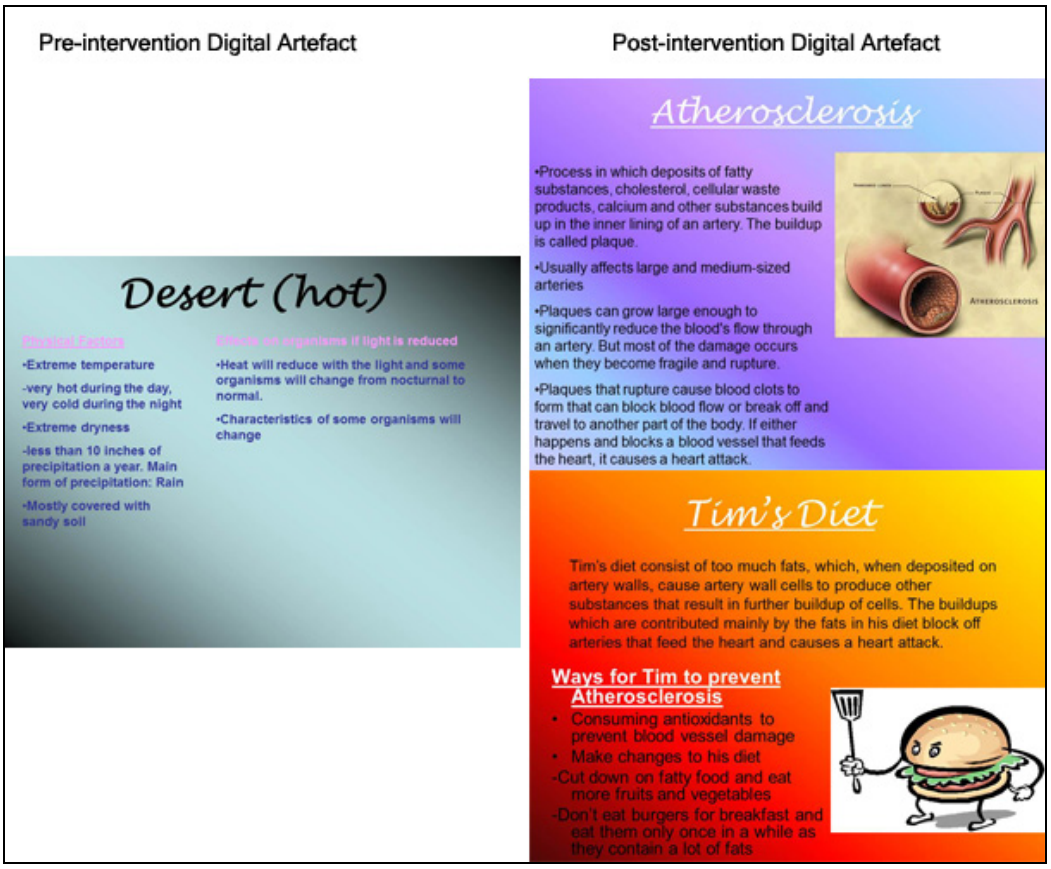

Figure 5. Student Pair 1 Pre- and Post-intervention Digital Artefacts

The presentation of the paper at the conference will present more in detail all the student pairs work on the task.

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Learning by Remixing: Assessing Students Design of Meaning in their Digital Responses to Academic Problems

Ole Christian Brudvik

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TOWARDS A SCIENTIFIC EVALUATION OF LEARNING EFFECTIVENESS

Geoff Woolcott, Southern Cross University, Australia

Introduction

Any evaluation of the effectiveness of learning requires that there is some clarity in describing or defining what is meant by learning and memory, a topic that has been the subject of many recent studies in a number of differing disciplines and using a number of different experimental methods and protocols. This paper focuses on learning and remembering in an institutional setting, such as a school or a university, where the learning is conscious, such that it requires engagement of attentional and working memory processes and leads to the storage of information in long-term memory (Sweller, van Merriënboer & Paas, 1998). Such conscious learning depends on the interaction between the nervous system, though sensory detectors of some kind, and the environment, and in an institutional setting there may be a number of ways that learning may be inoperative rather than ineffective. The environmental information that would normally be received by the nervous system, for example, may be blocked in some way, such as through a problem with the function of the retina in the eye. In other cases, the environmental information may be received at sensory receptors, but the processing of that information may prevent it being remembered in any conventional sense, for example, in visual dyslexia or Irlen syndrome (see e.g., the review of visual processing disorders in Ffytche, Blom & Catani, 2010). Additionally, there may be internal processing connections or mechanisms that may impair or inhibit learning and memory functions, such as seen in people classified as being within the autism spectrum (see e.g., Casanova, 2010 on connectivity disorders).

This paper outlines some of the investigations that have had an impact on the evaluation of learning effectiveness, both in educational research and in practice. This paper does not focus on learning that is blocked or inhibited in the ways described above, but rather on evaluating whether classroom learning, in general, may be effective. The paper begins by describing empirical methods, based initially in the use of pre-tests and post-tests and sometimes including verbal reporting protocols, that were developed over the last 50-60 years through information processing approaches to education (Lachman, Lachman & Butterfield, 1979) and which have been extensively developed through research based in such modern educational theories as cognitive load theory, both in a classroom setting and online (Kalyuga, 2005; Sweller et al., 1998). The paper then considers methods that have extended the use of

verbal protocols through more impartial examinations such as those that use eye-tracking and brain imaging, and through investigation of the physiology of emotional states and drives, since these may be necessary features of learning and memory. This paper finishes with a focus on how combination studies in cognitive psychology and integrative biology (an umbrella term for studies related to biology, including genetics and neuroscience) may lead to scientific evaluations of learning effectiveness, and to improvements in teaching and learning interventions that reflect this scientific evaluation.

Feedback and verbal reporting protocols

Education has had a long reliance on feedback from students, such as formal assessment or verbal reporting, to evaluate the effectiveness of learning. Educational research has had a similar reliance, particularly in its use of verbal reporting protocols, some of which have persisted in almost the same form for over 50 years (Ericsson, 2006), largely because this allows feedback about thinking processes. Some educational research, however, has not been subject to even this type of evaluation and classroom practices have been guided, in many cases, by untested theories and historical practices (Lyon, 2005; Sylwester, 1995). Verbal protocols have been used widely, however, and some modern studies have used such protocols in randomised, controlled experiments developed from evidence-based and testable instructional principles. Some such studies have developed instructional strategies from these principles, arguing that these have been demonstrated empirically to be superior to those strategies used conventionally in both classroom environments (Paas, van Merriënboer & Adam, 1994) and online environments (Kalyuga, 2005). Some researchers (Mayer, 2004) have argued further that such empirical evidence may invalidate some teaching practices and the educational theories upon which they are based. A common element in these studies is that they are effectively evaluating student learning effectiveness and that verbal protocols have been useful, in addition to pre-tests and post-tests, in finding out at which stage of an experiment learning is being made ineffective.

Cognitive load theory is one of a number of modern educational theories that consistently use verbal reporting protocols (for a comprehensive review of cognitive load theory see Schnotz & Kürschner, 2007). The theory was developed initially by Sweller and others (Sweller et al., 1998), based on generalisations from phenomenological studies, such as those of Miller and others (Miller, 1956) that argued for constraints on learning and memory due to attention and working memory function as well as for consideration of learning as information processing (Lachman et al., 1979). These constraints are considered as tied to learning effectiveness. As Sweller has indicated (Sweller, 2010), there has been some recent re-evaluation of cognitive load theory, and this has included consideration of its alignment with other modern educational and psychological research and the examination of scientific support for cognitive load theory. Schnotz and Kürschner (2007), for example, have suggested parallels between cognitive load theory and Vygotsky's zones of proximal development (Vygotsky, 1986) and have suggested an expansion of cognitive load theory that includes implicit learning. All of the

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experimental work that has been carried out, however, has until recently relied on verbal protocols to evaluate learning effectiveness.

The movement away from verbal reporting – non-verbal protocols

Some researchers in cognitive psychology (Moreno, 2010) have suggested that scientific support for educational theories and practices needs to be a feature of modern educational research, and that this should be sought in integration of research approaches from the social and behavioural sciences with that from the natural sciences. This echoes researchers with similar views whose studies of educational theory are based in modern scientific disciplines, such as integrative biology and, specifically, neuroscience (Fischer et al., 2010). Modern science, with its empiricism based in observation and measurement, as well as its prediction and testing protocols, may provide useful insights into education. The application of modern scientific approaches may, therefore, have the potential for significant impact on education similar to the impact on other fields, such as medicine or robotics (Edelman, 1970; Sporns, 2009), particularly in studies where such scientific approaches complement the approaches taken in the social and behavioural sciences (Goswami, 2008).

In order to move away from verbal reporting and, in part, to move towards scientific protocols, as well as away from issues associated with theories that account for actions 'after the event', some studies have used other non-verbal protocols that may be more impartial in examining student learning and its effectiveness. Eye-tracking (Salvucci & Anderson, 2001; Van Gog & Scheiter, 2010) and functional magnetic resonance imaging (fMRI) (Anderson et al., 2012; Goswami, 2008), for example, have been used to investigate correlations and possible causality associated with learning in an educational context, even though, in most cases these have been associated with verbal reporting and in situ observation, as well as pre-tests and post-tests.

Eye-tracking protocols

One of the reasons that researchers in education began monitoring eye movement, a protocol referred to as eye tracking, was to complement verbal reporting. The protocols usually involve video recordings of eye movement while a subject is viewing a task on a computer screen. In most early protocols the subject also reported verbally on thinking processes while undergoing the task, but in some recent studies the subject has reported after the task while watching a video replay (Cooke, 2010). Analysis of the recording, along with the verbal report, is used to indicate how long the subject was focused on particular stages of the task, and the protocol has been particularly useful where a subject overestimates or underestimates the time spent on particular parts of a task. In recent times, it has been suggested that eye tracking may be useful without the verbal protocols or, in cases where the verbal protocols are used, for calibration only of the eye-tracking protocols (Cooke, 2010). Such protocols may not be useful, however, in a scientific evaluation of learning effectiveness unless there is a clear resolution of issues related to the contribution of verbalisation and the types of verbalisation

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related to the material being used (e.g., see discussion of Cooke, 2010 in Elling, Lentz & De Jong, 2012).

In some educational studies, eye-tracking protocols have been used to estimate mental effort or cognitive load (Van Gog & Scheiter, 2010), a feature of information processing theories used in education (Sweller, 1988, 1994) and, in this sense, may be useful in evaluating the learning effectiveness of students engaged with a specific instructional environment or learning scenario. This may be also a way of testing, however, the effectiveness of the environment or scenario and more work may be needed on associating correlations with causality in these cases. There may be some potential, however, for such protocols to be used to assess blockages or inhibitions in attentional or working memory processes, depending on their use, perhaps, with other non-verbal protocols and these may be useful also in classroom learning or online scenarios.

Other non-verbal protocols

Some modern studies have begun to use other non-verbal protocols, such as those based in fMRI. Anderson and colleagues (Anderson et al., 2010; Anderson et al., 2012), for example, have used such techniques as Hidden Markov Models (HMMs) in conjunction with multi-voxel pattern analysis (MVPA) of fMRI data, as well as verbal reports and observations of students, to examine and correlate stages in the thinking sequence involved in solving a complex problem. In one of these studies (Anderson et al., 2012), variations of this approach were used successfully to track branching patterns of thinking in different students. One of the aims of these studies was to distinguish between different kinds of thinking processes during problem solving experiments, but such data may also be useful in identifying stages in the sequence of such problem solving, such as retrieval and computation. This may enable an evaluation of which stage of the process of problem solving requires intervention and, therefore, at which stage in the problem the student may have a learning deficit or ineffective learning.

This approach offers a method of investigating student learning that is much more discriminating than eye-tracking, but fMRI studies are also much more complex, expensive and time-consuming. The approach is also limited to cases where a long (about 10-30 seconds) problem is used, owing to the limits of resolution of fMRI, which records averages of blood flow over times much longer than those of normal thinking processes. The protocol has some implications for the evaluation of learning effectiveness, however, in that some such fMRI experiments have indicated whether a student was fast or slow in solving the problem, whether the student could not find a method for dealing with the problem, or whether the student was using an incorrect method (Anderson & Fincham, 2012).

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Physiology of human interaction

Although there may be many pathways in the nervous system that bias preferentially, either temporarily or permanently, the activation of learning and memory processes, the development or activation of those pathways is linked to emotions. Emotions, therefore, may be involved in the formation and modification of all human memory. Such links may contribute directly to concept formation, for example, through reinforcement differentially of any existing or newly formed connections in short-term or long-term memory, or through provision of additional connectivity through pathways in long-term memory (LeDoux, 1996). In order to approach learning, and the interactions involved, in a scientific way, some researchers have argued that emotional states may also need to be considered and have turned to affective neuroscience, a discipline in which emotions may be treated very differently than in traditional studies of psychology or every-day usage.

Grandin and Johnson (2005), for example, working from a background in affective neuroscience provided by such researchers as LeDoux (1996), describe only four intrinsic primal emotions; fear, seeking (curiosity/interest/anticipation), rage, and prey chase drive, referring to these as having a primary function as inbuilt brain-based motivators. Grandin and Johnson (2005) also describe four similarly intrinsic primary social emotions; sexual attraction and lust, separation distress (mother and baby), social attachment, and play and roughhousing. These emotions vary in intensity and probably frequency of expression between animal groups, and between animals within groups, including between human individuals. Other types of emotions, for example, those described in cognitive psychology and everyday life, may be considered as developing from such intrinsic pathways, but there is considerable variation as to what is considered as emotion, intrinsic or otherwise, even within affective neuroscience (LeDoux, 1996). Grandin and Johnson (2005), however, differentiate emotions from the behaviours that they call drives or instincts, such as hunger drive or sex drive, which are connected to monitoring of bodily needs states, and which involve sometimes complex patterns of neuronal pathways in long-term memory that are developed through learning. An important issue also is that feedback of cognitive states may affect both emotions and drives (Paul, Harding & Mendl, 2005).

One component of the evaluation of learning effectiveness, therefore, may be the assessment of emotional states. There has, in fact, been considerable progress in this regard, particularly in research related to human conditions where some emotional states may be absent or undeveloped, such as in people within the autism spectrum. One of the resources that has been developed as a way of investigating emotional states is the remote sensing of human physiology based, not necessarily in the emotions outlined above, but in emotions recognised in every-day use through facial expressions and involuntary physiological signals, such as fluctuations in tone and pitch when speaking, changes in skin temperature and conductance, changes in heart rate as well as skin and blood temperature (Picard, 2009; Poh, Swenson & Picard, 2010). Although such research presents a number of implications for the evaluation of learning effectiveness, there has been little application to this end. Such research, in any case,

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would need to be combined with research in affective neuroscience in order to evaluate the contribution of emotions and drives to the measurement of learning effectiveness.

Potential ways forward

The studies outlined above have included evaluations of learning effectiveness as part of broader investigations whose primary focus lay elsewhere. In the studies of Anderson and colleagues (Anderson et al., 2010), for example, the primary focus was on examining student thinking processes while they were engaged in a problem solving exercise. It may be possible, however, to adapt several of the protocols utilised above so that they can be used to focus on stages in the learning process that are not being optimised or that are showing indications that learning is being inhibited in some way, assuming that students are motivated to do the task being assessed.

Evaluation of learning, scientifically, by examining changes in long-term memory prior to and after learning seem to be impractical given the number of variables that may be involved and the limitations of modern technologies in the time frames that would be necessary. Sweller and others (1998) have indicated, however, that attention and working memory are functions that have natural limitations, in part to ensure that long-term memory does not become dysfunctional through addition of inoperative complexity (Postle, 2006). This sense of limitation has been supported in related studies in integrative biology that have documented in greater detail the internal processes that are involved in operational bottlenecks in attention and working memory processes (Miller & Buschman, 2007). A way forward for the evaluation of learning effectiveness may, therefore, be through a greater focus on such bottlenecks to establish measures that may be useful in helping educators ascertain, in an impartial and scientific way, when students are operating at the limits of attention and working memory. Such studies of attention and working memory have not, however, been focused on evaluation of learning effectiveness as such, but rather on resolving whether there is a bottleneck in the process and the related causes and mechanisms. Studies of working memory appear to have some focus on learning intervention, but results appear to be inconclusive as to how such interventions affect learning processes, much less learning effectiveness (Slagter, 2012).

The studies of Anderson and colleagues (Anderson et al., 2010) imply that there were places in the problem solving process where students were blocked from further progress, or were slowed in their progress through the problems presented, and this may indicate a degree of learning effectiveness. There are a number of differing factors, however, such as the influence of emotions and drives, which may need to be considered in any generalisations from such experimental procedures. Learning effectiveness, for example, may depend on particular emotions that may need to be evaluated by physiological processes, such as those outlined above. Some studies are beginning to investigate physiological measurements as part of a broader approach to experimental procedures for the examination of learning that recognises emotion as a cognitive part of the learning procedure (Colloca & Miller, 2011) and some

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studies have begun to combine physiological measurement with other non-verbal protocols, such as electroencephalograph (EEG) readings with eye-tracking (Carroll et al., 2010).

There has been some argument that the many cognitive models in use may need to be integrated (Lucas, 2005) and such integration may go some way to providing a framework for the evaluation of learning and memory and for the evaluation of educational theories and practices more generally. Some researchers, in fact, have looked to an overall picture in order to investigate all of the factors that may be involved in learning (Blakemore & Frith, 2000), and it may be necessary to consider this bigger picture with a view to controlling as many factors as possible in experimental procedures. It may well be the case, for example, that attention and working memory are not optimal when a student is tired or hungry and that learning is, therefore, not effective (e.g., Woolcott, 2011).

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EVALUATING LEARNING ACTIVITIES: A DESIGN PERSPECTIVE

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Abstract

This project outlines an action research project that explores how an Instructional Design department in a single-mode distance education institution can collect formative evaluation on learning activities in online learning environments. A research framework was proposed that consisted of three phases, design, analysis and evaluation. The first phase of the project was conducted to collect learning activity designs, determine the best way to represent them, as well as capture instructional designers' perceptions of good design.

Introduction

In Distributed Learning (DL) environments there is an implied separation between the learner and the learning resources, other learners and the instructor, either by time, distance, or physical space. The "glue" that binds the learning experience together, the learning environment, needs to be carefully designed to create the optimal conditions. Attention has been paid to various forms of evaluation in types of learning activities in eLearning environments, (Jahnke, 2010; Lou & MacGregor, 2004; Bernard & Lundgren-Cayrol, 2001), and at the same time there has been a focus on evaluating learning designs and design patterns (Agostinho, Bennet & Lockyer, 2011). What seems to be missing is a focus on how data that is collected from learners and instructors can be fed back into a process for improving and refining course design in a systematic way. This project aims to combine these two aspects by examining how an Instructional Design (ID) team can develop a meaningful process, which uses learner feedback, as well as professional reflection, to improve their practices, policies and learning activity designs.

This action research project is situated within an instructional design department within an open learning division that develops and delivers over 400 independent-study (print and web-based) and paced-cohort online courses. The Instructional designers (IDs) are responsible for managing the development of all new courses, and lead teams that include contracted subject matter experts (SMEs), media developers, editors, and technical staff.

This project focuses on planning, developing, implementing and then revising an evaluation process that will help determine the effectiveness of learning activities, designs and courses. As the online paced cohort model is still relatively new to the institution, the team is particularly interested in feedback on those activities which require interaction between the learners.

Departmental Goals

- To develop engaging and meaningful distance learning experiences
- To create a set of promising design patterns that work in the organizational context.
- Develop a methodology to evaluate learning activity designs/patterns so that they can be improved.

Research Questions

- What are the guiding principles and rules that the design team works within? How can making these principles explicit improve practice?
- Do students see the characteristics of these guiding principles and good learning design in the courses?
- How do students perceive the value of independent and interactive/collaborative learning activities?

Literature Review

Evaluation

The evaluation of learning activities and materials in TEL and Distance environments covers a wide spectrum of activity, from the granular assessment of individual learning objects, to individual course evaluations, to extensive program evaluations that occur at an institutional level Jung (2011) argues that traditional forms of evaluation used by institutions are problematic in that they often overlook the student's perspective. C*ourse evaluation* usually only occurs at the end of a course, and is designed for the most part to measure teaching effectiveness, rather than the course materials. Frick, Chadha, Watson, & Zlatkovska (2010) found that though end of course evaluations show a correlation between high scores and student achievement, they often do not indicate how teaching can be improved or how learners can better attain course outcomes.

Another research focus has been on student perceptions and practices around certain types of activities, such as online discussions, role-playing, and computer mediated project-based learning, to name a few. These types of studies focus on collecting data from a variety of sources, including student surveys, interviews and content analysis, and often provide recommendations for procedures, design improvements and facilitation. In one example, Beckett, Amaro-Jimenez, & Beckett (2010) examined graduate students uses of online asynchronous discussions (OADs) and found that though most students perceived them as useful, they were also often disappointed and frustrated by a lack of teaching presence. Through the findings of their study on computer conferencing, Bernard & Lundgren-Cayrol

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(2001) developed a matrix that outlined different stages and components of collaborative online learning, which could then be used as a framework during the design process. The results of these types of studies highlight the effectiveness of different pedagogical approaches and can provide a basis for theoretically generated design principles, which provide suggestions for evidence-based change. They don't, however, provide a feasible model for evaluating course activities and materials on an ongoing basis as part of constant improvement cycle for change – one of the aims of this project.

Though there is an expansive body of literature on learning design development, very little research specifically targets *evaluating* learning designs or activities, particularly from the learner's perspective. In their Mod4L project report, Falconer, Beetham, Oliver et al (2007), outline their use of a wiki for *instructors* to evaluate a set of learning designs. Laurillard (2008) proposes a framework, but again, this focuses on designers, educational technologists and instructors evaluating learning designs, with a focus on pedagogy, which, though beneficial, does not include the learner perspective. Noting that many of the evaluation frameworks that have been developed focus on some aspect of the materials, such as intention, use, learning outcome or other, but not all, Bundsgaard & Hansen (2011) propose a holistic framework that focuses on two separate concepts, learning materials (artifacts) and designs for learning (which they define as how these artifacts are then organized and articulated (in space and time) to support learning). Their three-step evaluation approach examines the **potential for learning** (the affordances and challenges of the materials and proposed competencies), the **actualized learning potential** (the potential for learning when the design is enacted as planned for a given context) and **the actual learning** (whether or not learners meet the proposed competencies). They suggest the complex framework be used as a heuristic for design – as a method that could "investigate and demonstrate under which specific circumstances learning materials actually work in real settings" (p. 42). Another recent study by McNaught, Lam & Cheng (2012) may also provide insight as their model uses a combination of an evaluative matrix of the learning design, student questionnaires, and an evaluation of student achievement on an embedded authentic task. For our purposes these models might outline a much briefer exploration, and could provide a basis for gathering evidence to validate whether or not a planned learning sequence was actually realized by learners.

The literature confirms that evaluation is an important process, but many of the tools and methods that are currently used do not fit our context. They are either too broad, too granular or don't include a learner perspective.

Design Practice

Campbell, Schweir and Kenny (2006) frame instructional design as "an active practice based on community, practical reasoning, personal perspective, and semantic innovation involving memory and leading to action" (p.15). Instructional Designers need to be flexible and reflexive, both creative and structured, and open and responsive to new ideas, technologies, theories and complex situations. As many have pointed out, design is messy, complicated, full

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of 'wicked problems' and often improved through discussion, reflection, and criticism (Goodyear & Retalis, 2010).

Yanchar and Gabbitas (2011) highlight that current design practice can be characterized as "eclectic"; designers create a "conceptual toolkit", which includes theory, models, principles and philosophical frameworks used to make decisions. They argue that we need to go even deeper and critically examine what they term "design sense" through a "critical dialogue where there may be a clash of divergent views" (p.390). They suggest through conversations with SMEs, exploration of the literature or, as we are exploring in this project, through direct feedback from stakeholders such as the learners, a 'critical flexibility' can occur within the design team.

So how do instructional designers incorporate this critical turn in their practice? Williams, South, Yanchar et al. (2011) found that clients and stakeholders were not interested in formal product evaluations, but found, not surprisingly, that evaluation is built into all aspects of designers' practice. In this project we aim to formalize an already inherent process.

Methodology

We chose an action research approach because educational problems are situated, complex, multi-dimensional, and often related to one's own practice. Effective educational research needs to be iterative and "develop into a participatory and collaborate process of deepening reflection, more controlled and critical practice and the establishment of more educationally defensible situations and institutions" (Carr & Kemmis, 1986, p.185). In this project, we need to go beyond where most traditional research stops, and plan an "action" phase where policies/plans, procedures, programs emerge (McPherson & Nunes, 2008).

The following project research framework (Figure 1) outlines three distinct phases of research activity.

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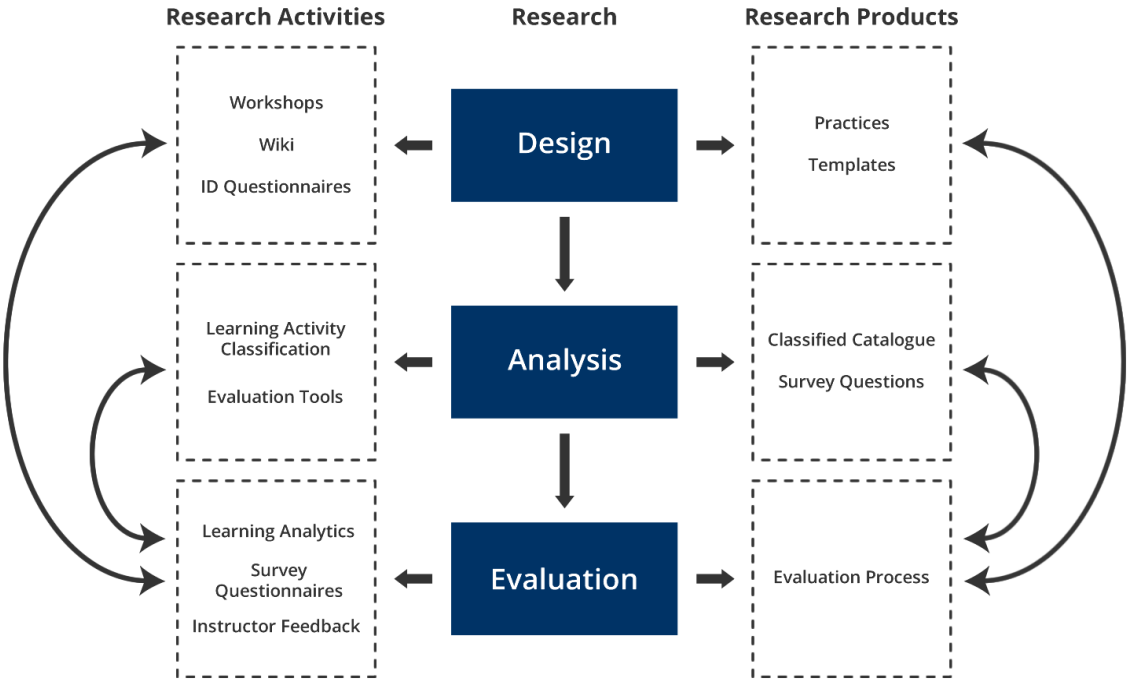

Figure 1. Action Research Framework for three phases of project

1. Design: Determine current design practices
   - Collect activity designs, determine the characteristics, when/why they are successful, facilitator and learner requirements.
   - Create an activity repository and generic template catalogue that allows learning designs to be shared and used with course development teams.
   - Continue to add to the learning activity design repository. This phase will be continuous and iterative and can be built into the professional development practices for the instructional design department.
2. Activity Analysis
   - Using the characteristics outlined in the first phase of the project, create a catalog of activities that will be evaluated with facilitators and learners.
   - Determine survey questions for evaluation tools, the types of analytics that need to be gathered, and further questions for facilitator/learner focus groups.
3. Learning Activity Evaluation
   - Analytics-activity data from LMS that demonstrates learner and facilitator engagement, activity levels, etc.
   - Activity feedback from the learners and instructors from survey questionnaires.
   - Follow-up with structured feedback from facilitators.

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Data Collection Methods

We incorporated two methods of data collection: workshops and learner surveys. During workshops with our ID team, we used a wiki to collect data to evaluate good design practice and the effectiveness of learning activities from a designer practice, arriving at some guiding principles for design. We administered learner surveys to all students enrolled in online, paced courses over two semesters (402 students, 31 different courses), asking them to comment on the general course structure and the value of the independent and interactive learning activities. We received 113 student responses and collated the data (frequency tables, graphs and comments) to share with the ID department. We then held further workshops to engage in a discussion of how to incorporate this learner feedback into future practice and design and to develop templates of successful learning activities. We critically examined Yanchar and Gabbitas' (2011) "design sense" to achieve a "critical flexibility" which would in turn be incorporated into our practice.

Findings and Data Analysis

Learner Surveys

Though the learner data is of great interest in and of itself, and worth a more thorough analysis, as the focus of this study was how an ID team could use this data to evaluate learning design, only a short overview of the results of the learner responses will be included here.

Closed-response Questions

As Cohen, Manion and Morrison (2007) suggest, exploratory data frequency tables and cross-tabulations can provide a good overall view of the data. The visual frequency tables tell us that generally the learners feel that the activities in the courses are contributing to their learning, are relevant, well organized, well-spaced and a good use of their time, thereby exemplifying the guiding principles and characteristics of good learning design identified by the ID team. The tabular data provide the frequency of responses, but it is also interesting to look at percentages, and the visual representation provided in Tableau©, gives a better overall sense of the trends in the data and allows the user to manipulate the data, isolate the responses for specific courses, or groups of courses (by program or major), and then compare and contrast the data between categories.

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THOMPSON RIVERS UNIVERSITY
OPEN LEARNING

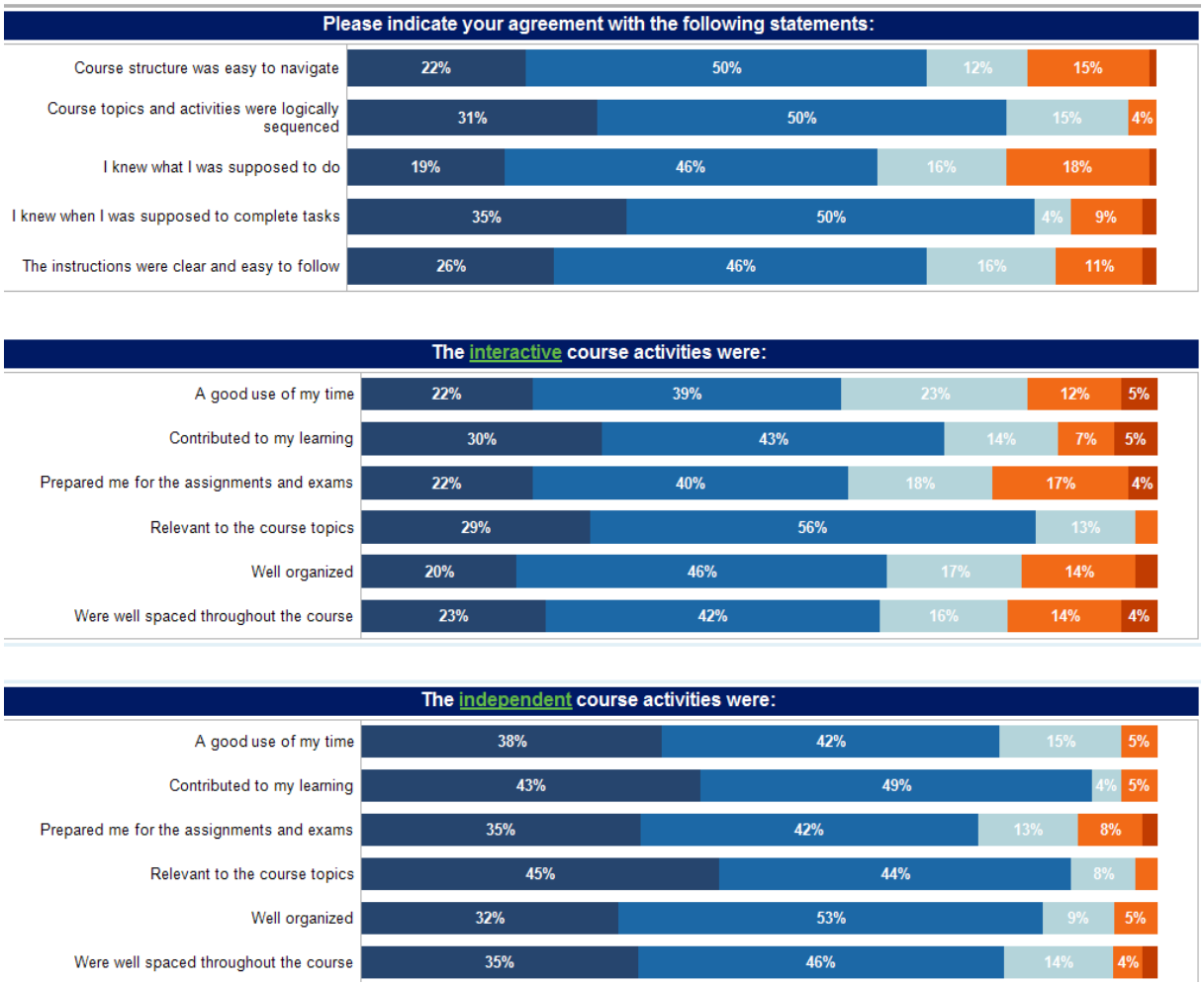

Figure 2. Dashboard view in Tableau©, showing overall frequency percentages of student responses

Overall we can see that most respondents 'Strongly agreed' or 'Agreed' with the statements about their courses. Interestingly, learners were more positive about the relevance of the independent activities vs. the interactive activities. There were no 'Strongly disagree' responses for the independent activities, and a higher percentage of students rated these positively (SA or A, 84 %), than the interactive activities (69 %). If you compare only the statements "Independent/Interactive activities were a good use of my time" you can see a significant difference – 80 % positive responses (SA and A) for independent activities vs. 61 % for the interactive activities. To determine the underlying causes we would need to probe more deeply, which is reflected in the ID responses to the data (discussed further in the next section). However, these responses raise questions about the perceived value of interactive activities and could have an impact on future design, leading the ID team to be more explicit about the nature and value of collaboration or to be even more selective about the inclusion of these activities.

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Open-ended Questions

Learners identified course structure (sequencing, clarity of instructions, pacing/timing), reflecting the IDs own guiding principles, as strengths. They also saw the following activities types as most useful: linking, formal assessments, discussions, reading, applied, reflective and independent. Interactivity was also seen as a valued part of the courses.

Paradoxically, when asked to comment on the least useful activities, learners included course content (course topics, workload and resources often commenting about there being too much work or content) and interactive (discussion forums, group projects) and reflective activities.

What stood out for most of the IDs was that the most comments, both positive and negative, were about interactivity. Learners were polarized on whether or not they found discussions, group projects and group tasks, such as problem solving, a good use of their time. Though not a surprising result, it is a topic that many of the ID participants identified as needing further exploration

Conclusions and Reflection

The learner feedback data give a preliminary impression, that the ID team's core design principles are resulting in courses that are clear, well organized, relevant, have a variety of interactive and independent activities and that there is awareness of student workload and instructor requirements. This is a great first step in building a formative evaluation process that will provide direct feedback on the learning activity and designs. A need for more specifically targeted data was identified, as IDs were interested in how learners perceive and interact with certain types of activities (i.e. group projects, or a series of online discussions), sequencing and discipline specific issues.

Next Steps

In reflections on the learner data, the ID team identified some core design principles. These can now be used, along with the other factors that were outlined as areas of interest for change (processes, practices, outcomes), to develop a formal set of core principles for guiding design practice. The learner feedback data was shown to be an important factor when reflecting on practice, as designers examined their basic assumptions about what and why activities are successful, but other factors, such as those that can outline how to improve processes (sharing with colleagues, developing activity templates) will also need to be taken into consideration when building a reflective model for change. Williams et al (2011) support the notion that there is value in formalizing the implicit evaluation tasks that IDs perform in their everyday practice when they said "A willingness to identify and negotiate with stakeholders, perform needs analyses, conduct pilot tests, modify based on feedback, and complete other activities associated with more formalized evaluation could facilitate the process of producing quality instruction, even when formal evaluation was not feasible" (p.905).

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This research project has also had an effect on policy and action, informing a new process for evaluating learning design at the course level. This research survey has been revised and approved and will be administered to students after a course has been offered the first time. Instructional designers will combine this information with feedback from the Open Learning faculty member who facilitated the course and a review of learning analytics from the learning management system. Designers will use this information to make revisions to improve the quality of the course and the learning experience.

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The Joy of Learning
Enhancing Learning Experience - Improving Learning Quality
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DESCARTES AND ASTERIX? HETEROGENEITY, A KEY TO INCREASE THE JOY OF LEARNING? TWO CASE STUDIES IN FRANCE

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Katherine Maillet, Institut Mines-Télécom – Ecole de Management, France

Introduction: towards Descartes and Astérix

We introduce the ingredients for a recipe to reinvent humanism for the 21st century, where adults recover the curious minds and enthusiasm of their childhood, the "*Honnête Homme*[1]" of the *Renaissance* in Europe. We put values from the "Age of Enlightenment" into practise in today's globalised learning contexts.

Innovative pedagogy refers to an improbable blend of talents, like "Close Encounters of the 4th kind", when Asterix meets Descartes. What kind of teaching/learning methodology will allow us to find a second childhood, the joy of learning as we go down the path of Lifelong Learning at work, at home, and in learning communities? How do we let "*adolescents*" and juniors show the way to adults and seniors; can we continue to turn a deaf ear to their needs as amphitheatres empty out, while Google Scholar and I-Tunes U allow students ample opportunities to personalise their learning? Shall we continue to organise boring (even if virtual) classes, built on the model of traditional, vertical and outdated pedagogy?

The French paradox is Astérix interacting with Descartes in schools, universities and even at the workplace. Might this be an interesting opportunity for the "French exception" to be considered as "French arrogance"[2]? Telematics was born in the 80's and introduced into every home and office. *Minitel*[3] use exploded in France thanks to the "*minitel rose*"[4]. Today we are crazy for *Serious Games* and passionate for MOOCs which allow learners to zap according to their pleasure, stimulating their curiosity, behaving with the 16th century approach "à *sauts et à gambades*"[5], in the spirit of Montaigne and Rabelais (a surgeon, illustrious writer, famous for his humour), who already advocated interdisciplinary for formal and informal education.

What happens when pedagogues, native to the country of Descartes and Asterix, meet Anglo-Saxon didactics? What are the ingredients for success to keep customers, pupils and even students awake, active and happy? Joy by learning as advocated by Rabelais[6] is emerging as a new concept in universities, even the Sorbonne! Pleasure is considered as essential for learning in corporations with the enormous success of Serious Games (i.e. KTM has increased its production by 25 %)[7] . The didactic revolution is fuelled by the enormous impact of web 2.0

and social networking in private and public life. Shall we resist change or surf on the opportunities of mutation welling up like a tsunami?

Ethics are fundamental: public and private organizations have to make decisions. They must choose economic models to make massification and individualisation co-exist. Shall we build Europe based on UNESCO's principles: education for all, at anytime, anywhere, or shall we choose education for the best, wealthy and most able physically, morally and socially? Collaborating through diversity and heterogeneity must be experienced, making choices easier. This is the game to play, the challenge we chose.

Case Study 1 – M@ster AIGEME, eLearning & Education to Media at Sorbonne Nouvelle Paris; University without Boundaries in Ile de France

Creative and academic Methods

The *Renaissance* is on the way in pioneering universities and corporations which accompany and lead the change. In Sorbonne Nouvelle Paris 3, as in major French universities and Grandes Ecoles (highly selective management and engineering schools), traditional pedagogy is gradually giving way to socio-constructivist approaches and reversed pedagogy, especially in the professional M@ster AIGEME, *Applications Informatiques: Gestion, Education aux Medias et Eformation* (Informatics applications: Management, Media Education, and eTraining). The students' project is central to individual and collaborative work. It is presented in an ePortfolio which is linked to collective ePortfolios. This format provides two functions: reflexion on the learning process and making the selected works which attest to the students' competencies acquired at university and in the workplace visible.

We organise "just in time", "tailored", "ubiquitous", "personalised" learning, which is a reason for satisfaction on both sides, although complicated to manage. While following their programme of study, students are also trainees in a wide variety of workplace settings: eLearning SME's, corporations, like Digital Publishing, KTM advance, big groups like Total, Air France, BNP Paribas, Euronews, IBM, organizations like AUF, Médecins Sans Frontières, universities in France or abroad and NGOs. Students work on site or participate in pioneering telework contexts.

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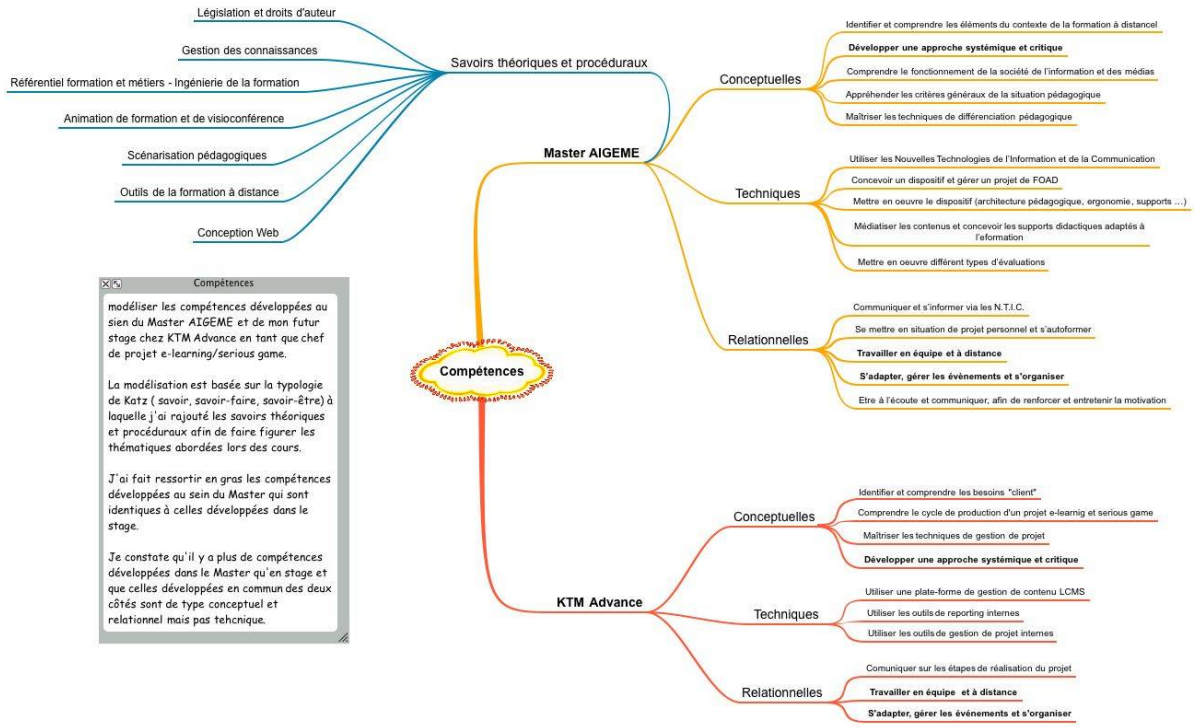

Figure 1. Competency Model

Students work on real tasks which are demanding and time-consuming as a basis for transforming "pedagogy" inherited from the 19th century into "didactics", giving the central role to the learner. Students learn to collaborate and manage projects individually or with a team. Distance Learning makes change inevitable. Students work together on challenging tasks in heterogeneous groups, where each member is valued as an expert, whatever his/her job, previous studies, or nationality may be. This demand for quality increases motivation, making work a pleasure when it is successful. Living together is a pleasure guided by simple principles: Acquiring knowledge, learning by doing, learning to communicate, learning to behave, learning to change, and learning to collaborate.

The teaching team has many tools at their disposal for tutored and blended learning: "video communication" for *"Les Lundis du M@ster*[8]", virtual classes, chat, forums, ePortfolios, Moodle, websites and DVDs in 11 European languages, face to face sessions, etc. They adapt the learning delivery to suit the specific pedagogical or logistic context. For example the national centres of the Francophone world (CNF) guarantee high speed Internet, videoconferencing and multimedia computers and devices.

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Figure 2. Video Communication Room at La Sorbonne Nouvelle

Synchronous virtual classes and meetings, face to face moments for conferences or defences become a pleasure and an occasion to measure cultural, linguistic and contextual differences.

Figure 3. Meeting with teachers and tutors

Collaboration and communication are essential to increase motivation, which is why we created the concept of video communication to replace passive videoconferencing. The climate of confidence which develops between the teaching team, the tutors (African Francophone) and the students breeds success whatever their profile, conditions of life or context may be. Equality is essential for a climate of mutual respect and tolerance through formal and informal activities.

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The M @ster AIGEME provides an interdisciplinary, multicultural and multilingual curriculum for students, teachers and professionals (8 disciplines); this heterogeneity increases and gives credit to their ability to adapt and to "exchange to change[9]". We propose two programmes, eLearning and Media Education with individualised and self directed learning, personalisation to foster motivation in project teams, part-time internships in corporations and support awareness in learning through the ePortfolio of competences. Learning becomes a thrilling experience with International teams: 20 nationalities among students, teachers and tutors. We teach and share interest in Intercomprehension[10] and shared ethics (Mühlstein-Joliette, 2001) by helping countries to develop through agreements with AUF[11], UNESCO, FIED[12], University of Oujda, and the Lebanese University and by providing expertise for governments through embassies and French Alliances.

One can also find pleasure in dealing with difficulties, constraints and stress. For visibility and recognition[13], the diplomas are delivered by Sorbonne Nouvelle Paris 3 University, which has a reputation for excellence, especially in languages. Our formal, academic requirements are very demanding and strictly presented, especially for the internship report and professional Master's thesis "à la française", which prepare the way for future research.

Realising the Creative Potential towards Future

We recognize and value competencies acquired through informal learning. Some of these experiences include organising events like *Les Lundis du M@ster,* creative brainstorming organised collaboratively, project management and ePortfolios, which are defended like the internship report and dissertation at the end of the programme. Both sides of the brain are in action; the approaches of both Descartes and Asterix' are required and mixed.

The students in the M@ster AIGEME gain confidence; they develop their identity and eReputation to find jobs, giving importance to individual and collaborative success. Most of them are already teachers, engineers, multimedia and web designers and developers. They all become professionals in eLearning (IFD), Project Managers, course designers for the web, LMS, Serious Games, online tutors, in education in the media industry (IEM). They have opportunities to meet international experts from corporations and research and development. They gradually learn the tools (mind mapping, competence maps, etc.) and rules of academic research, in order to defend their ePortfolio, internship report and Master's thesis at the end of the programme.

New competencies emerge in R&D, which are useful to corporations, universities, NGOs and for individuals learning to become leaders, negotiators, serious and creative team leaders.

They find help through excellent tutoring by excellent former students. Tutor is a certified job in AUF[14]. Social networking is active among former students through Facebook, LinkedIn and the association "*J'* ❤*AIGEME".* The alumnae guide the new promotion, helping them to find a job; as does the "Godmother" or "*Godfather" of the promotion (The President of the Sorbonne Nouvelle, *PromoHalimi*; from EDEN, *PromoBö*, *PromoDondi*; AUF, *Promo Oillo;*

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FIED, *PromoChabauty; research, PromoVidal*, *Promo Jacquinot Media world, PromoAugry, etc.*). They all participate in the final Master's defence, give lectures and share smart events.

The levers of change management are:

- The centrality of the student's project and career goal though personalisation made visible through the personal learning environment,
- The ePortfolio to develop confidence, allowing students to build on and master their digital identity. They use it to reflect on their career and on lifelong learning (through the irreversible Bologna process , VAE[15] and credits system, making students active rather than passive in the learning process),
- Web 2.0 tools and networking are used to foster personalisation and collaboration. The central use of several languages, European awareness, and Intercomprehension even amongst Francophone participants (Mühlstein-Joliette, 2013),
- Physical and more importantly, intellectual mobility develop students' abilities to adapt to any context (national, cultural and linguistic differences, technical equipment, etc.),
- Links between research and development, between universities and *Grandes Ecoles* (not obvious in France), between disciplines, backgrounds for teachers and students.

Case Study 2 – The Personal Learning Environment for French language acquisition at Institut Mines-Telecom

This case study describes the framework for an experimentation in the fall of 2012 with Personal Learning Environments (PLE) at Telecom School of Engineering (TSP) and Telecom School of Management (TEM) in France to support French language and culture acquisition among foreign students enrolled in a diversity of Master's and Doctoral programs.

Context, the Survey and Needs Analysis

The decision to promote self-regulated learning at the university where most learning is directed was motivated by a prior study conducted by the foreign language department in 2010-2011 on 638 French-speaking university students. It was designed to identify how informal learning with English language media enhances English language acquisition.

By associating the respondents' answers to the survey questions with their standardized English language test scores (Oxford Placement Test (Allen, 2004), Test of English for International Communication – http://www.ets.org/toeic) they were able to identify a positive correlation between a student's level of English and the amount of time he/she spends learning English informally by interacting with media and participating in social networks, and that students spend a significantly greater amount of time each year consuming English media than in formal learning, in the classroom. Both the OPT and the TOEIC have equivalency tables which correlate test scores to the Common European Framework of References for Languages (CEFR – http://www.coe.int/t/dg4/linguistic/Cadre1_en.asp) . The

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framework provides six levels from A1 (breakthrough or beginner to Level C2 (Mastery or Proficiency). The study found that students with levels "A" spend six times more time engaged with English language media informally than they do in the formal setting of a classroom; Level B1s X 10; Level B2s X 11; and Level Cs X 12 (Storz et al., 2012). The study revealed the rich variety of media that capture students' attention with songs, TV series, and films being the most widely accessed. 60 % of the students cited their favourite TV series: 987 titles were cited (113 different titles) (Chotel et al., 2011).

Introducing the Personal Learning Environment

It was decided to introduce the PLE as a framework for learners to access, aggregate, configure and manipulate digital artefacts of their ongoing learning experiences, in view of fostering responsibility for learning so that learners are able to develop a learning strategy, search for resources independently, learn, and then reflect on their learning process and progress as promoted by the EU funded ROLE project (http://www.role-project.eu/).

As in most universities across Europe there is an increasing number of foreign students enrolled in graduate programmes at TEM and TSP. They represent a heterogeneous group of learners from countries across the globe with varying linguistic needs according to their programme of study and personal interests, making the classroom a difficult place for personalising learning. Although the students live in France, most of their courses are given in English and English is most often the informal "lingua franca". Additionally, students tend to form social groups according to their native languages, so learning French is a challenge, requiring students' attention, time, and motivation. They are tested when they arrive and are put into groups of about 12-16, according to their proficiency. They have three hours of French class each week throughout the academic year. The PLE experimentation was launched with a group of 14 foreign students from countries in Europe, Asia, and South America during the fall semester of 2012.

During the first semester, September – December, class activities focused on introducing "self-regulated learning" and the Personal Learning Environment. Activities included:

- Self-assessment of French language level and skills with reference to the Common European Framework of Reference for Languages, EuroPass (http://europass.cedefop.europa.eu/fr/home) and ePortfolio (http://www.eportfolio.org/),
- Identification of individual language learning goals for French and preference for learning resources,
- Learning strategies,
- Introduction to the PLE with examples,
- Setting up PLEs,
- Presenting PLEs and sharing resources,

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- Evaluating the PLE according to language goals identified in the beginning of the course.

The French was class is divided into two 90 minutes sessions. The first was dedicated to groupwork and presentations about how students develop their PLE as described above and the second session was dedicated to a web conference where each student was assigned a remote (Poitiers) personal tutor, a teacher-trainee in French as a foreign language, who coached them to improve their linguistic skills. During the second semester students will use the PLEs to progress in French language acquisition and reflect on learning.

At the current time we are analysing the work produced by students during the first semester. We will consider the variety of learning goals and the choice of resources to achieve those goals. During the second semester our research will focus on how students exploit the learning opportunities they have created for themselves, their achievements in second language acquisition, and their reflections on the learning process and progress.

Innovative Theoretical approach and eQuality European Approach

From Limn-R to ANR TRANSLIT: the Virtues of Interdisciplinarity

Created from CNRS Limn-R project (http://www.univ-paris3.fr/seminaire-limin-r-litteraties-medias-information-et-numerique-113001.kjsp), bridging 3 disciplines, the media, digital literacy and information literacy and placing them in the French and francophone concept of *"littératie"*, TRANSLIT researchers study the interactions between education and training, in media, digital and information cultures (Frau-Meigs, 2012; Liquète, Delamotte & Chapron, 2012). The authors of this paper study distance learning and eLearning as a thread crossing the three disciplines.

Intercomprehension, a Powerful European Tool

Universities and "Grandes Ecoles" still study languages separately. Corporations like Air France, Total, IBM, etc.) understand the power of intercultural awareness and show a real interest in intercomprehension courses like the M@ster AIGEME. Claudine Mühlstein-Joliette (content, stereotypes and songs) and Isa Cox (multimedia and LMS), at Sorbonne Nouvelle Paris 3, are piloting the French part of European projects on Intercomprehension, European Awareness and intercomprehension (Capucho, 2007; Janin, 2006), EU&I, Intermar project for Maritime schools 2011-2013 in collaboration with the European research group Redinter. In the words of Umberto Ecco (Eco, 1994):

> *Polyglot Europe will not be a continent where individuals converse fluently in all the other languages; in the best of cases, it could be a continent where people can meet each other and speak together, each in his or her own tongue, understanding, as best they can, the speech of other. In this way, even those who never learn to speak another language fluently could still participate in its*

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> *particular genius, catching a glimpse of the particular cultural universe that each one expresses in speaking the language of his/her ancestors and tradition.*

Be Smart: Gaming Approach, Mobile and Sensitive Solutions towards eQuality in Europe

Serious games are a success, even in universities. Many mobile games have been developed for language learning limiting the gap between education and training and ordinary life. The European concept of MOOC is appearing in many conferences. Content management systems, personalised learning environments are user friendly and open. With the interactive white board, like on our mobile tablets and phone, we use our senses naturally, write with our fingers, and communicate through voice and videos without borders in life as well as in training. The body recovers its place not only in role plays for simulations, CV videos, but also with videoconferencing which requires acting, to develop one's talent in animating virtual classes, chat and social networks. The 21st century students use ibooks to recover gestures of the ancient *clercs* in monasteries reading the *volumen,* but they need to find personal assessment, resources to monitor the learning process (like Sevaq+ http://sevaq.efquel.org) and receive certification.

Conclusion

The purpose of this paper was to provide two case studies which illustrate how two very traditional institutions of higher education, the Sorbonne and Institut Mines-Telecom, are implicated in migrating from directed learning to "self regulated learning". While universities in countries like China, India and Brazil are deploying technology for educating the masses, technology and massively available digital content are providing learners in France and Europe the power to personalise what they learn and how they learn it. Technology has the power to connect heterogeneous groups of learners across cultures, languages, disciplines, professions and generations, liberating them from the constraints and confines of the classroom and providing them a space where they can creatively co-construct knowledge and skills. Quality standards are evolving through the FIED's influence (Mühlstein-Joliette, 2013) in France and through important European research groups (Efquel, EADTU, OCDE). They provide an alternative model to the American view linked to equality. Ethics is central for R&D, for educators and students, to build a sustainable economy where the diversity of human beings replaces choices made by the markets.

A possible roadmap for Europe might be to follow the trails of Asterix and Descartes, succeed in personalisation and massification, contextualise interdisciplinarity, informal knowledge and ergonomics, respecting the value of differences and heterogeneity, just to be happy. Would this not be an exciting challenge for Europeans in the 21st century?

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[3] Videotex online service accessible through telephone lines, and is considered one of the world's most successful pre-World Wide Web online services
[4] « Pink Minitel », erotic services
[5] Jump and romp
[6] Rabelais, Gargantua (1534), *Lettre de Gargantua à Pantagruel et Le Tiers Livre* (1546).
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[8] A programme of video communications regularly scheduled on Mondays http://visioconferencesmasteraigeme.wordpress.com
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[10] *EU & I, European Awareness and Intercomprehension*, Lingua Project 2003-2007, Open resources on DVD and Web site eu-intercomprehension.eu/indexfr.html, and AIGEME course in 11 languages and in 2013 Intermar, http://www.intermar.ax
[11] Agence universitaire de la francophonie (University agency for the French-speaking world)
[12] Fédération Interuniversitaire de l'Enseignement à Distance (Federation of Distance Teaching Universities)
[13] "*Les pépites de la fac*", numéro Hors série, Master AIGEME, Nouvel Observateur, February 2013
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ONLINE TEACHING FACULTY DEVELOPMENT IN SPAIN: CHALLENGES AND FUTURE PERSPECTIVES

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Introduction

The current European Higher Education Area (EHEA) is fostering the development and implementation of a teaching and learning model in which teaching roles are being challenged and shifted.

Beyond the fact competence-based design for programs is the core issue concerning this new scenario, it is also true that the use of the Information and Communication Technologies (ICT) could be considered as a driver for this change , and a helpful ally for teachers to better develop their role in this context. The integration of ICT-based practices and online education into universities have extensively been spread out worldwide in the last years (Bates & Sangrà, 2011; Bullen & Janes, 2007; Carr-Chelleman, 2005).

Online or blended programs are the most significant way in which most of the universities are facing this situation, even if their aims are twofold: to increase the number of students and to adapt themselves to the new methodological approaches in an easiest way. Consequently, the organization of teaching, as well as cultural issues related to, have been adapted (Lokken & Womer, 2007; Sangrà & González-Sanmamed, 2004).

Teacher's professional development becomes a key issue to get the highest levels of quality teaching and learning considering this situation. There is a discussion about the kind of competences teachers have to have to teach online. Some authors consider there are a set of teaching competences that are the same, no matter if they are going to be used in a face-to-face environment or in an online one (Bautista, Borges & Fores, 2006). Some others say the competences are quite similar, but also recognize some differences in order to teach much more efficiently (Goodyear, Salmon, Spector, Steeples & Tickner, 2001).

But many other authors take into consideration that ICT change the educational context a lot, so in order to handle online teaching, no matter if the delivery is going to be blended or fully online, teachers should get a number of specific online teaching competences (Ardizzone & Rivoltella, 2004; Espasa, Guasch & Alvarez, 2009; Laat, Lally, Lipponen & Simons, 2007;

Muñoz-Carril & González-Sanmamed, 2009). These specific competences should be achieved through training and experience, so different programs have been put into practice to increase the capacity of teachers to become good online teachers too.

Again regarding the context in which teaching is going to be performed, Bawane and Spector (2009) highlight that the characteristics of the programme, the role the teacher has to perform, and the resources available (financial, functional, and human) require specific competencies from the teachers in order to successfully carry out their mission. Considering the previous references it is logical to state that online teaching faculty development is a must to efficiently teach in online environments (Mcdonald & Poniatowska, 2011).

The project

As far as higher education institutions are challenged by the current changes in society, teaching development is a key issue in facing new demands. In addition, the extremely important introduction of ICT in these institutions and the growing provision of online courses make online teaching faculty development an actual need for those who currently teach at the universities.

Given this, a group of Spanish researchers from different universities considered the opportunity of determining which is the support for and the provision of online teaching professional development in Spain, where online programmes have considerably increased in the last years. Thus, a research project that was partially funded by the Spanish Ministry of Education was carried out.

The study aimed to:

- identify which are the training actions that Spanish universities are carrying out to foster the acquisition of online teaching competences amongst its faculty;
- define the main characteristics of the current provision for online teaching faculty development; and to
- give recommendations to further actions to be taken to improve the performance of online teaching.

The project also pointed out on the training required for the use of ICT in regular face-to-face lectures, but this paper will not consider de data related to this.

Methodology

A qualitative approach was the basis of the research design. Data from the whole set of Spanish universities (77) was collected through two main instruments: a) A full analysis of the existing information shown in each university website; and b) An in-depth interview with the university responsible for teacher's professional development units. Later on, analysis of data was carried out by the group of researchers who led the project.

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The first instrument consisted in a technical record corresponding to each university. This record included a) general institutional information (name, public/private legal condition, unit in charge of faculty development, existence of a strategic plan for this purpose); and b) actions developed to match with the training needs. Data were gathered from the universities' websites. For the purpose of the study, training actions were considered those sets of activities and training tasks planned by the universities, which led to the acquisition or improvement of teachers' competences in the use of ICT. They could be addressed to its use in the regular classrooms or to teach online, and could be delivered online or face-to-face including the following types of actions:

- Courses,
- Seminars,
- Workshops,
- Work groups,
- Conferences,
- Sets of talks,
- Online communities of practice,
- Calls for teaching innovation projects.

The second instrument was an in-depth, semi-structured interview addressed to the responsible people for the professional development units. They were collected through a telephone call, which was recorded and processed and categorized later on.

The semi-structured interview had three main parts. The first one was related to institutional information, in order to check and validate if the record initially collected through the website scanning was correct. Deeper level of information was achieved. The second part asked for the specific characteristics of the training actions (main aims, objectives, approach, competences that should be acquired, orientation to face-to-face ICT use or online, amount of actions, amount of participants, and average of participants respect to the total of faculty). The third one consisted in a set of open questions asking about the perception of the advantages and disadvantages of training oriented to online teaching competence acquisition and development, problems and difficulties found for the expected implementation of online teaching faculty development actions, and any other comments or suggestions on the topic.

Answers were categorized and records of each university updated. Records were sent to the responsible people of each university in order to validate the information they contained.

Findings

From the 77 universities belonging to the Spanish higher education system, we collected data of 61 from their websites. The rest of the websites did not have data available of the surveyed topic. Almost a 65 % of universities (49) were available to participate in the second part of the study, i.e., the in-depth interview. Those that did not participate argued lack of time to devote to the questions, lack of experience in the use of ICT or, especially, of online education

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programmes. Few of them considered this was confidential information that does not have to be public.

The main findings of the research show the current situation regarding the provision and support for online teaching professional development, as well as for the use of ICT in their regular classrooms. As a summary:

- The whole set of universities is providing some kind of training on the use of ICT, but most of them don't define which are the competencies the teachers should acquire. The design of these training actions is still keeping the same structure than before the EHEA criteria.
- Despite the use of ICT is widely spread in the Spanish universities, it is still in an initial stage. Diversification of applications and pedagogical approach is missed in many cases. So, the universities are not taking advantage of the whole educational potential that ICT are providing.

By analysing the data, the content of the training actions can be classified in seven categories:

1. Software tools for office management purposes (Open Office, Microsoft Office, search engines).
2. Virtual teaching and learning environments (LMS/CLMS, Moodle, Blackboard / WebCT).
3. Graphic design, use of images and audio and video (Flash, Dreamweaver, Photoshop, Podcast).
4. Videoconferencing tools (Adobe Connect, Elluminate, Webex).
5. Tools 2.0 (Google drive, wikis, social networks).
6. Software for research (SPSS, Atlas-ti, Refworks).
7. Other teaching tools (e-portfolios, e-rubrics, digital blackboard).

A set of 6 different blocks are identified when analysing the aims of the training actions:

1. Contextual: related to the EHEA demands and to the expectations of the labour market.
2. Pedagogical: aiming to provide the teachers with tools that could help them to make their job easier, strengthen their motivation, improve and update their teaching skills, get better achievements ...
3. Methodological: development of new learning strategies, shift of paradigm when designing ICT-supported teaching ...
4. Innovative: use of ICT as a trigger for innovation inside and outside the classroom.
5. Collaborative: use of ICT to increase collaborative work and collaborative learning amongst the students and amongst the teachers.
6. Instrumental: give patters and tips to take advantage of the use of particular technologies.

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Specifically regarding the training provided for online teaching, there are also seven main blocks of content:

1. Implementation of online courses in LMS or CLMS.
2. Content creation and edition (resources and materials).
3. Organization and management of online teaching.
4. Tutoring.
5. Communication (voice of videoconferencing tools).
6. Collaborative work (use of some particular tools as Dropbox, Nong, Google groups, etc.).
7. Assessment (simple tools for automatic testing, e-portfolio, e-rubrics).

More specifically, regarding the professional development for online teaching, some limitations were also found out:

- There is no framework of competencies for online teaching in most of the universities, resulting in a big confusion between aims and competencies.
- Some universities don't define the aims for these training actions, and they lead them towards an instrumental use.
- 15.6 % of the universities are not providing any kind of training activity for online teaching. In addition, some training actions are still focusing only on the use of the Virtual Campus as a place where teachers can upload content material and students can ask for help.
- Most of the training activities focus on the content creation and edition (29 %) and assessment (25 %). Only a few of them focus on the management and organization and management of online teaching (4 %). This is probably due to the lack of methodological culture in online education.
- Most of the programs still push transmissive strategies for teaching, even in online settings. This means they are replicating the face-to-face strategies instead of developing and providing alternative methodologies that could better fit for online environments.

Conclusions

The main findings of the research show that the current situation regarding provision and support for online teaching professional development in the Spanish universities has a number of challenges that should be faced in the very next years. The emergence of the MOOC phenomenon has put online education in the leading edge of higher education provision, and after this starting, low level stage, competitiveness will ask for teachers with improved online teaching competences.

The most important concern the study arises is the lack of awareness about the fact online teaching demands to get specific competences to perform at a high level. Painter (2003) stated

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institutions can put barriers to success if they do not think on everything what is involved in online education and if they ignore the needs the teachers have in this particular area. On the other hand, a very important number of training actions are instrumental. This could be revised, because pedagogical competences in the use of ICT are as important as the technological ones (Turner, 2005).

Teaching methodologies in online education should be revised. There still is an important amount of programmes that just replicate the teaching methods used in face-to-face classrooms when shifting to an online course. Faculty development has to be a relevant tool for this shift, especially because also new teaching roles are arising (Bawane & Spectyor, 2009).

The research has also identified some future perspectives that should be taken into consideration. Institutions have to have a strategic plan for ICT integration and online teaching at each university if it is not done yet. The online teaching professional development plans should be oriented to the improvement of the teaching and learning process. Finally, periodic assessment of the institutional impact has to be fostered.

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TEACHERS' USE OF TECHNOLOGY AND THEIR IDEAS ABOUT LEARNING

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The rapid development of technology and its application to educational contexts has presented educators with a unique opportunity to fundamentally change the way instruction occurs (Mayer, 2010; Richardson, 2012; Sheppard, Seifert & Wakeham, 2012). Teachers have at their disposal a vast repertoire of possibilities for creating enriched, engaging educational experiences. Most importantly, the utilization of technology creates the potential for developing classrooms that are learner-centred (Tamid, Bernard, Borokhouski, Abrami, Richard & Schmid, 2011). Yet, there is nothing inherent in the technology that will necessarily result in learner-centred classrooms. In fact, the evidence suggests that the adoption of technology leads to little change in classroom practice (Cuban, 2001; John & Wheeler, 2008; Mayer, 2010; Penuel, 2006; Sheppard et al., 2008; Sheppard et al., 2012). For example, in a study of the adoption of laptops by students in a high school, Sheppard et al. (2008) reported that the laptops were little utilized and had minimal impact on practice. Teachers in these classes were likely to use the laptops for presentation of information, record keeping, and communications while students seldom used them in support of their own learning. Similarly, in a study of 10 elementary or intermediate school teachers, designated by their respective school districts as exemplary teachers who used technology in their classroom, Sheppard et al. (2012) concluded that although technology has the potential to facilitate a shift away from the predominant teacher-centred classrooms to classrooms that are more learner-centred, the existing pedagogical norms of teacher-directedness continue to inhibit any meaningful shift. Mayer opines that the failure of technology to transform classroom practice may be the result of a focus on technology rather than on learning per se (Mayer 2010). That is, initiatives aimed at adopting technology have failed because they do not take the learner into account assuming that the teacher and learner will adapt to the new technology (Mayer, 2010, p.183). That is, while technology has the potential to create student-centred classrooms, it has failed to do so because is has ignored the two fundamental principles relating to learner-centred classrooms: (i) instruction is based upon a profound understanding of learning and (ii) lessons are developed from the perspective of the learner (McCombs, 2000).

Learning and comprehension requires students to create meaning (Wittrock, 1989) by engaging in cognitive and metacognitive processes (Winne & Hadwin, 1998). These processes are executed by the student or invoked through appropriately designed instructional prompts, cues or tasks (Winne, 1985; Wittrock, 1989). Critical to effective learning is the development of self-regulatory and agentic processes (Zimmerman, 2000; Bandura, 2001; Puustinen &

Pulkkinen, 2001) that may be heavily influenced by the classroom environment (Butler & Cartier, 2004; Perry, VandeKamp, Mercer & Norby, 2002).

In learner-centred classrooms, the students' individual needs determine the teaching-learning processes. Although the content as outlined in the textbook or the curriculum guide may be considered as important, it is viewed as "powerless without an engaged learner" (Lent, 2012, p.14). As a consequence, teachers in learner-centred classrooms consider students' abilities and interests, and focus on making tasks relevant. They recognize and support the diverse needs of students in their classrooms; provide students with choice and control over their learning; provide time for critical reflection; facilitate collaborative student engagement and critical reflection, and encourage students to make meaningful real-world connections (Lent, 2012; McCombs, 2000). Consequently, instruction in a learner-centred classroom has several noteworthy characteristics:

1. Students are engaged in activities that involve finding meaning and involve complex thinking. To that end, they learn cognitive and metacognitive strategies to support thinking;
2. Students are engaged in collaborative activities to generate meaning and solve problems;
3. Students are working at appropriate levels through accommodations for their individual needs, and
4. Students are working on activities that allow them to develop self-regulation through exercise of autonomy and self-determination. (Sheppard et al., 2012, p. 2)

Sheppard et al. (2012) concluded that teachers who are considered to be exemplars did not necessarily utilize technology to create learner-centred classrooms. Therefore, if implementing the technology does not result in a transformation of classroom practice, then perhaps the question is not one of teachers' familiarity and use of technology but that of their understanding of learning and learner-centred classrooms. Consequently, in this study we examined teachers' knowledge about effective learning and effective classrooms, and their associations with learner-centred practices.

Method

The participants in this study were ten elementary school teachers and their classes in an Eastern Canadian province located in eight schools within four school districts (see Sheppard et al., 2012 for a more detailed description). The teachers agreed to participate in the study after being nominated as exemplary teachers who used technology in their classrooms. Naturalistic observation was used to study the use of technology in the classroom. A total of 32 lessons were observed. Each teacher was observed a minimum of two times; most were observed three to four times and one was observed six times. During observations, the researcher acted as a non-participant, taking notes of events in the classroom, looking for

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evidence that technology enhance the quality of their learning or promoted self-regulated learning.

Field notes were transcribed and summarized into concise articulations of significant events within the classroom. Two researchers reviewed the summaries to establish the match between the summaries and field notes, with discrepancies resolved by consensus. The summaries were used to develop an overall sense of activities in the classroom, and then coded into meaning units. Teachers were interviewed at a time and location convenient to the teacher. Interviews were recorded and later transcribed. Teachers were asked questions about effective learning, effective classrooms and how technology can be used to enhance learning. Two researchers read interview to identify potential themes. The protocols were subsequently analyzed to identify meaning units. In this case, a meaning unit referred to words or phrases representing teachers' behaviours, their ideas about learning, their use of technology, and students' behaviours. Consensus between researchers was achieved. Data from the observations and interviews were analyzed using QDA Miner (Provalis, 2011), a program designed for analyzing qualitative data.

Results

Two researchers independently categorized the lessons as being either teacher-directed or learner-centred. From these categorizations, teachers were labelled as either teacher-directed (TD) or learner-centred (LC). Based upon responses to questions concerning their use of technology outside of school, teachers were categorized by their level of sophistication with using technology (novice, comfortable and sophisticated). Five of the teachers were classified as being comfortable with technology while five were considered to be sophisticated users. Seventeen of the 32 lessons and four of the 10 teachers were considered to be teacher-directed; 15 lessons and six teachers were learner-centred.

In this analysis, small sample sizes and low statistical power precluded the meaningful use of inferential statistics; consequently, reported numbers are descriptive only. Results from coding teachers' responses to questions about learning, classroom practice and technology are presented in Figure 1. In this figure, labels in the boxes represent ideas identified in the teachers' protocols or variables used to describe teachers. The numbers with parentheses inside the boxes are the numbers of teachers making statements labelled by that code. The exception is the three boxes describing classroom structure; those numbers refer to the number of observed lessons corresponding to each type of structure. Line labels are the probability of an element (or code) being associated with a type of teacher (LC or TD).

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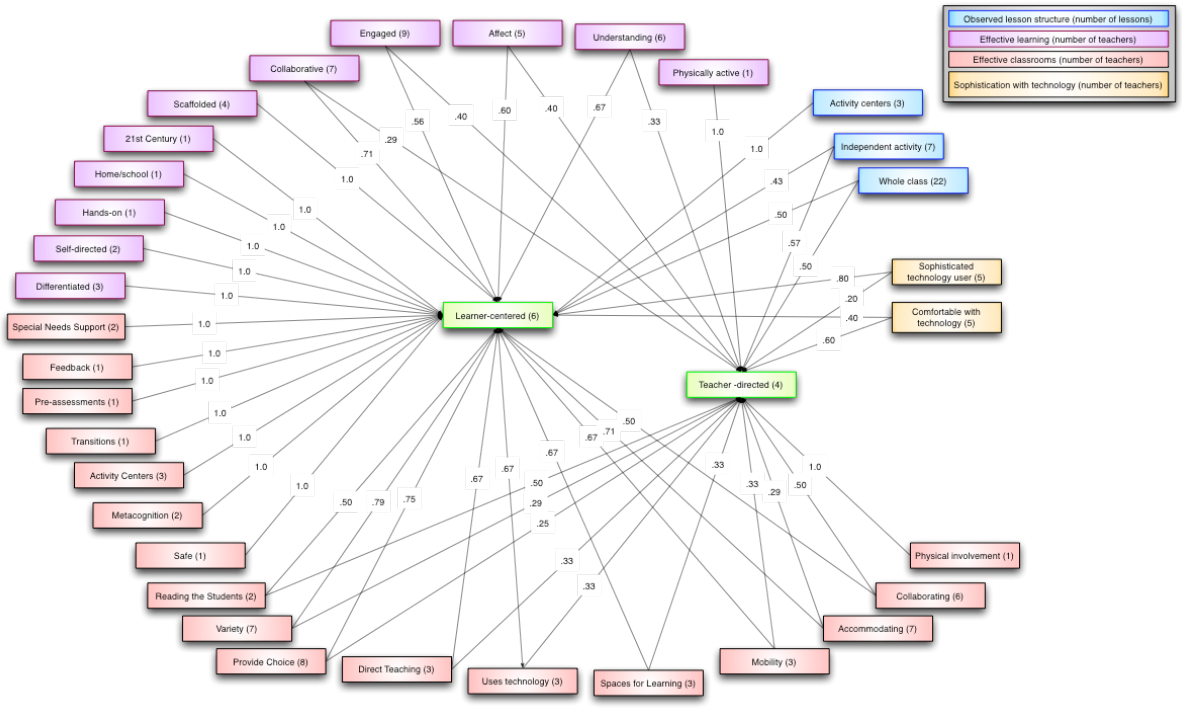

Figure 1. Statements about effective learning, effective classrooms, type of classroom structure and level of technology sophistication for learner-centred and teacher-directed teachers.

Note: The labels colour-coded boxes are observed classroom elements derived from coding (see legend). With the exception of lesson structures, numbers inside each box indicate the total number of teachers making statements labelled by that code. For lesson structures, the numbers indicate the total number of observed lessons corresponding to each type of structure. Line labels are the probability of an element being associated with teaching approach (LC or TD).

Effective learning

Overall, teachers had surprisingly little to say about effective learning, what it is or how it occurs. In total, teachers made 64 statements identifying 41 elements (average of 6.4 and 4.1 respectively), ranging from a minimum three statements about two elements to a maximum of nine statements about of seven elements. Teachers' responses indicated that almost all teachers thought learning was effective when students were engaged, yet there was little articulation of what this meant or how it was achieved. Most teachers also commented that effective learning occurred when students worked collaboratively, and when they were developing meaningful understanding of the content. While these ideas are consistent with the principles of learning and learner-centred classrooms that were stated previously in the paper, there was little description of these ideas, and not all teachers articulated all of these ideas.

A closer examination revealed that teachers who were learner-centred made greater numbers of statements. It was also the case that differentiated instruction, scaffolding and developing self-direction were recognized as components of effective learning by LC teachers but not by

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any TD teachers. Likewise, when a factor of effective learning was mentioned, it was more likely to be mentioned by an LC teacher than a TD teacher. Overall, it appears that LC teachers have a better understanding of effective learning than TD teachers. A cluster analysis of the co-occurrence of codes yielded two significant patterns. The first pattern, collaboration, engagement and understanding were the elements of effective learning. In the second pattern, differentiated and scaffolded instruction constituted effective learning. Yet while, these two patterns of elements emerged, the actual number of teachers that fitting into each pattern is small, meaning that few teachers identified these elements concomitantly.

Effective classrooms

Analysis of teachers' answers to questions about effective classrooms produced 17 elements. Most teachers recognized that providing accommodations for students, creating variety, offering choices and providing opportunities for collaboration were elements of effective classrooms. While these ideas are consistent with the principles of learner-centred classrooms, both the number of ideas expressed by teachers and the depth of articulation was low. Beyond that, there was considerable diversity in ideas about elements of effective classrooms ranging from providing opportunities for physical involvement and mobility to structures of direct teaching and promoting metacognition. What is striking to note is that when a teacher made a statement and an element identified, it was more likely to be mentioned by a teacher who was LC than TD. LC teachers made statements about 16 elements while TD teachers made statements about 10 elements. For example, while providing choice was mentioned by 8 teachers, more LC teachers mentioned it than TD teachers. Likewise, while a few teachers mentioned direct teaching as a component of an effective classroom, the teachers were more likely to be LC than TD.

The cluster analysis of co-occurrence resulted in five different patterns of ideas about effective classrooms. The first emergent pattern was that of diversity: an effective classroom offered variety, provided choice and accommodated students' needs. The second pattern was that of instruction: the effective classroom involved direct teaching, the use of activity centres and technology. Third, a management pattern was present in which the effective classroom was one in which the teacher was able to "read the students," effect smooth transitions between activities and provide feedback to students. Providing spaces for learning and opportunities for mobility emerged as the fourth pattern, while utilizing pre-assessments and access to special needs supports was the fifth pattern. While these distinct patterns were present, the actual numbers of teachers associated with each was small.

Teachers, learning and technology

Teachers were asked about questions about the use of technology in their classroom: how they plan for using technology, how they use it to adapt to students' needs, what role it can play in learning and how it has changed their role as teachers. From our analyses, a few important highlights emerged. First, if a teacher was a sophisticated user of technology, that teacher was more likely to be an LC teacher than a TD teacher. Second, using technology to engage

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students in learning was the most common way in which technology could enhance learning (5 teachers). It was also noted by a number of teachers that technology can support differentiation (7 statements by LC teachers, 1 by a TD teacher) and inclusion, permit accommodation to students' needs and allowing for greater flexibility within lessons.

Overall, there was a variety of singular explanations given for how technology could enhance learning and practice suggesting no common understanding of the application of technology to classroom practice. Yet while some teachers noted that technology can have its positive effects, it can be counterproductive as well. For example, one teacher noted that using the computer is not simply for playing games, it must be used for a specific task for a specific need. The application of technology to the lesson needs to be thought out. As a result, teachers pointed out that the use of technology has placed greater demands on them. Planning lessons and finding resources has resulted in them being "busier" and presented greater challenges.

Of the 64 statements made about the use of technology to enhance learning, only two were directly related to learning as a cognitive or thinking activity. In one instance, the teacher commented that technology can enhance creativity; in the other, the teacher stated that the teacher can be used to activate prior knowledge. This suggests that teachers may have only a superficial understanding of learning and how technology can be used to enhance learning. Indeed, one teacher commented that the technology has not changed her role as a teacher. Rather, she did her planning and preparation and if technology could support her work she would make use of it.

Discussion

Previous research has suggested that the introduction of technology into classrooms does not necessarily lead to the transformation of classroom practice. Indeed, there is an implicit assumption that the introduction of technology will result in greater student engagement and enhanced learning. Our research suggests that this is not necessarily the case. In fact, our observations suggest that there are many lessons in which students are deeply engaged and technology is not being used and many lessons in which technology is being used for trivial purposes (Sheppard et al., 2012; Sheppard et al., 2008). In order for this transformation to occur, teachers need to understand the fundamental principles of learning and how technology can be used in accordance with those principles. Our findings in this study suggest that while teachers might have an intuitive sense of effective classroom practice, their articulation of what constitutes effective learning and how technology can be used to support it is superficial. However, our results also indicated that LC teachers had a better understanding of both technology and learning than TD teachers.

These findings have important implications for district policy and professional development. Often, professional development has focused upon the technology itself rather than learning. We suggest that professional development should continue to support teachers' use of technology because teachers who were sophisticated users of technology tended to be learner-centred. But we also suggest that professional development should focus on helping teachers

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to develop a more sophisticated understanding of learning and the principles of the learner-centred classroom. The issue may be that teachers cannot use technology to develop a learner-centred classroom because they do not have a profound understanding of the relationship between a particular technology and learning.

This study was exploratory in nature, and has a number of limitations to be considered for future research. First, the participants were volunteers from a pool nominated as exemplary teachers by district personnel. Consequently, the criteria for being exemplary is uncertain and, perhaps, questionable. Further studies might focus on specific criteria for inclusion. Second, teachers were observed for a limited number times within a specific time interval. This suggests that the observations were a snapshot of a very short interval taken from a long timeline. Third, further conceptualization of the learner-centred classroom is needed. What does it mean to be learner-centred? And should, or can every lesson be learner-centred? If not, perhaps our observations were taken at an unfortunate time.

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HUMAN CAPITAL STRATEGY IN A MODERN UNIVERSITY: MEETING STUDENT AND SOCIETY NEEDS

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As noted by UNESCO, higher education today is a mass phenomenon or, as some publications put it, a "universal" phenomenon. There are many reasons for this, including the lack of highly skilled workers in some countries; the need to teach new professions to the unemployed, efforts to overcome social inequality in access to education, etc. These needs can only be addressed through the extensive use of modern information and communication technology (ICT) in education.

As also noted by UNESCO, the opportunities to obtain quality education have been greatly expanded by open and remote learning, as well as by the use of ICT. The open information environment enables uploading of online training courses and electronic-textbooks, live broadcasting and video recording of lectures and speeches, and also communication between students and teachers, even when they are located in difference countries. Public domain educational resources are now widespread. MIT OpenCourseWare, YouTube EDU, Academic Earth and other similar projects provide access to huge numbers of video lectures recorded in hundreds of the best educational institutions worldwide. The emerging 2.0 libraries offer online services (electronic catalogs, RSS, WiKi and blogs), and social networks are assuming an important role in modern education by promoting the education process in environments that are close to students, overcoming territorial and organizational barriers, enabling open discussions and topical data exchange, and further promoting the principle of "study as lifestyle".

The use of ICT has developed from a fashionable trend into a basic requirement of modern education. This can be seen, first of all, in the expectations now brought by the students to the educational process. Studies in Australia found that 77.7% of respondents use the Internet in their studies, 89.1% consider that smartphones and cellular devices are necessary for the learning process, 64.8% believe that ICT is an important part of the academic process, and 72.1% said that use of ICT enables them to feel more confident in the auditorium and classroom.

Secondly, technology, remote learning and e-learning are often the only way to meet the needs of students, particularly of handicapped ones. ICT offers profoundly new opportunities to young people living in remote areas, far from regional centres. Remote learning takes account

of the individual abilities of each student and provides access to top-quality courses and lectures delivered by acclaimed teachers.

Strong demand for remote learning also comes from many other social groups – young mothers who need refresher training before returning to work, and young people who are acquiring a new profession or improving their skills by means of higher education or a further training course. Remote learning has much appeal for Russian nationals living outside Russia and for foreigners who want to learn Russian or obtain special training provided by Russian institutions. People aged 55+ (the "third age") are also increasingly involved in Internet learning. Special training systems and programs can help them to use public services, *e-shopping*, etc.

Use of ICT for remote learning can address many of the problems caused by social inequality. However, improvement of educational standards can only be achieved by combining technology with modern teaching methods. At present, many teachers are not ready to use ICT in their work, and there needs be a focus on raising their skill levels. Adding ICT to the basic teacher training program is an obvious first step, to be reinforced by the creation of online professional communities, joint training, video studies and ICT coaching. On-line communication with students and colleagues, and use of social networks and professional communities will enable teachers to obtain feedback and overcome isolation as well as to reduce costs in the teaching process.

Today's information society sets teachers new tasks and requires them to learn new skills – continuous acquisition of knowledge, self-education, handling a wide range of information types, sorting diverse and contradictory data, and ability to think creatively rather than follow patterns. In addition to the traditional challenges of imparting knowledge, abilities and skills, teachers nowadays need to teach ICT competencies and ensure that the knowledge, which they impart to their students, will be useful in practice.

In more detail, the skills that teachers nowadays are expected to master are as follows:

- IT skills: using the Internet (searching for and identifying information); using public ICT resources; generation of distributed content; application of services.
- Communicative and linguistic skills: interaction and cooperation; self-assessment; willingness to cooperate; teaching stances; working with leading international authorities.
- Management skills: organizational management; efficient performance by students; team work; self-education; management of scientific and creative teams.
- Professional skills: imparting knowledge, know-how, experience and specialized expertise; linking theory and practice.

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The ICT abilities of modern teachers are crucial for making their educational institutions competitive and for ensuring the quality of the education they provide. Important IT abilities include:

- efficient generation of teaching materials in Office Word;
- preparing and showing multimedia presentations in Office PowerPoint;
- creation of a grading/marking system and maintenance of an *e-register*;
- issue of student assignments, collecting and checking of completed projects using email and Internet services;
- checking for plagiarism in work by students and using search engines to find information;
- joint planning and maintenance of *e-calendars* in Office Outlook;
- use of the Live services and social network tools for interaction and efficient communication;
- teamwork by project groups and efficient interaction in a unified information area by means of a SharePoint portal.

Universities today are more than just providers of educational services. They are also the place where new knowledge and unique projects are generated. Accordingly, teaching staff are shifting their focus from publishing and participation in scientific conferences to the achievement of tangible and financially quantifiable results (commercialization, and innovation). Universities need to promote efficient fundamental and applied research, develop science schools, apply innovative technologies in the academic process, and set up small innovative enterprises and business incubators. The scientific research and innovation work of university scientists must correspond to the strategic goals of the community and the country, and also meet the needs of real sectors of the economy. The new focus on innovative development had persuaded many educational institutions to establish their own dedicated scientific and innovative structures (research institutes and R&D centres).

Teaching staff should meet the requirements of the audience which they work for aiming at knowledge development. A modern student is a participant of an innovative online community of young people who have already mastered information technologies suitable for communication, work and learning in any place, at any time and in any format. Now learners better conceive information in tech paradigms which are more familiar and handy to them (web, audio and video graphics, hypertext, wiki, short messaging system, social networks, etc.). Today, a student prefers to manage his/her time and not to memorize a lot of information but to have in hand advanced systems of quick search and analysis of network information on themes which are meaningful for him/her and attention-grabbing. The teacher should talk to the student in the same language and, therefore, to master the latest technologies.

Human capacity building customary for higher education system for the decades is not sufficient now as it's not enough for a teacher to be a specialist in a subject field and provider of knowledge "packed for consumption".

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Innovative HR management should include creation of conditions for professional and personal growth of teaching staff through a set of measures aimed at effective selection and assignment of personnel, formation of a comprehensive system of professional development for all categories of staff, provision of social protection for teachers, development of positive social environment at the university and improving the incentive system which should influence on capacity for innovation.

The priorities in the work of university teachers and administrative staff have changed. In addition to the long-established tasks to be fulfilled higher education establishment (and especially its leaders) faces new challenges:

- building modern educational environment and regular upgrading infrastructure;
- support harnessing continuous acquisition of new knowledge and the ability to learn independently;
- encourage the development of skills for acquiring information and processing any disparate and contradictory data as well as skills for independent creative but not reproductive type of thinking;
- promote amplifying a traditional principle of "forming knowledge, skills and abilities" by a principle of "shaping competence"; and
- advocate focus on practical application of knowledge.

It is worth looking at how these principles are being implemented in a specific higher education institution. The Moscow State University of Economics, Statistics and Informatics (MESI) has taken every opportunity to promote e-learning: the "Virtual Campus" remote learning system has been operational for several years, enabling teachers to work together in Wiki, assign reports topics, term papers and tests, maintain subject calendars, and make announcements. MESI also runs its own *e-register* to track student work online, using attendance data and publication of test results for each semester.

To date, about 97 % of teaching staff, office and management personnel, support staff and students at MESI branches are registered with MESI information networks, including Outlook mailboxes, access to MESI Share Point, Skype and ICQ. A number of MESI teachers use Web 2.0 tools, such as Twitter and blogs, in addition to active e-learning systems.

This enables teachers to impart new skills to their students: independent study; self-organization and planning; handling of information sources in electronic media; and commitment to lifelong learning and skills improvement. The electronic environment of "subject information centres" ensures that the content provided to students is always up-to-date. These centres comprise projects by students, research outcomes, newspapers, magazines, books, articles, conferences and seminar materials, all regularly updated using Web 2.0 tools. Groups of teachers also use the tools offered by such centres to create and update digital content and teaching materials. Teachers communicate on a one-to-one or group basis via blogs and forums on specific themes, and use YouTube to share experience and skills. The outcome is a full life cycle of educational content in a distributed online environment.

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Extensive use of ICT technology and e-learning means that MESI can provide regular training to its personnel with a focus on the modern skills that are most in demand. The Institute approves an annual program for development of its scientific and educational personnel, including an external skills enhancement program at least once every five years (since September 2013 – once every three years, in accordance with updated Law on Education) as well as internal training programs. The internal programs for scientific and educational personnel are regularly updated and upgraded to take account of the Institute's strategic goals and objectives. e-learning technologies enable MESI staff to improve their skills without interrupting their work cycle and when physically distant from the Institute itself.

MESI has established a system of faculty and staff training which is based on the following principles:

- project and process orientedness (as training aims to support projects / processes model of the university activities and optimize their implementation);
- an integrated approach to learning (a combination of various forms and methods of training);
- principle of transversal training (training involving all categories and levels of staff);
- multilevel approach (individual, group, corporate);
- principle of lifelong learning; and
- principle of modular training.

Since 2003, MESI carries out a series of organizational and managerial seminars – so called Winter and Summer School – which is a tool for the shaping the university as a learning organization. From the very beginning it is a kind of school of strategic planning attended by the heads of all management levels (university, institutes, branches, chairs, research and supporting units) as well as faculty.

The activities at the organizational and managerial seminars include a variety of formats: lectures and workshops with the participation of leading experts and organizations in the professional fields and in e-learning; knowledge management seminars in small groups; workshops aimed at creating ICT competence in higher vocational training; learning café; monitoring activities and assessment of training quality and participant satisfaction. Sharing best practices and innovative experience in management, research, teaching, ICT usage, instructional design and others is an important component of School. Each seminar is finalized by a round table discussion which summarizes and addressed issues for further development.

The essential outcomes of every seminar are the adjustment of the personnel training and development plan and elaboration of staff motivation program aimed at achieving the objectives set out in the course of School.

The main theme of each Winter and Summer School and topics of lectures, workshops and master classes are defined in accordance with the strategic objectives and priorities of the

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university in the certain period, e.g. the following areas were tackled: quality of education and e-learning; university and regional development; investing in self- development; building knowledge management system; strategic planning and balanced scorecard system; integrated system of university management; quality of the educational process and setting parameters of monitoring, analysis and evaluation; creation and testing of information and knowledge environment of educational institutions; implementation of an innovative approach to implementation of academic and corporate knowledge management system; development of pedagogical and communicative competence of young teachers, scientists and managers; education in the information society, e-Learning in the university; Smart University, OER in educational process, etc. For each topic, along with theoretical part, practical training and skills development are envisaged for teachers and managers of all levels. Today, due to the high level of computer and communication technologies as well as e-learning technologies which are common for MESI the process of faculty and staff training can be organized on the job. It's extremely important for such distributed university as ours which comprises a number of its branches all over Russia and abroad. The webinars are widely used for training faculty and personnel making the process cost-effective, time-saving and timely, without knowledge and innovation lag in remote areas.

The biggest gain from the ICT revolution in higher education, according to University students, is that they no longer feel hemmed in by their institutions – they feel themselves to be modern people, fully adjusted to the realities of today's world. The new demands and expectations of students shape the image of the modern teacher, who has evolved from a mere source of information into the student's guide to the world of global knowledge. Teachers must seek modern methods, standards and technologies to maintain their personal knowledge levels using the opportunities provided by e-learning. Today the quality of education and training provided in universities is judged by the readiness of their graduates to work in modern, high-tech companies – specifically, by whether these companies are glad to employ the graduates.

ICT technology and e-learning are adequate tools for rapid transfer of up-to-date knowledge. These human resource development tools will help every teacher to train competitive professionals, thereby facilitating the growth of industry and the economy. Without doubt, ICT technology is the driving force that can deliver strong and sustainable growth of education, giving people the skills they need to fully realize their potential in today's workplace and in life.

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OPEN LEARNING APPROACH WITH REMOTE EXPERIMENTS

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Introduction

The education in applied sciences, engineering, and technologies is one of the Key Competences for Lifelong Learning (2006/962/EC) and priority areas in the educational strategy in European Union. There is a widespread consensus in Europe that industry requires well educated STEM graduates. Since students' motivation to learn depends upon the knowledge and skills of the teachers, teachers should have access to high quality and real-life-based resources to build their competence, to support student's improvement, to familiarize with contemporary research and development, and industrial needs in STEM.

The OLAREX consortium realized that the knowledge and skills requirements exchange between school and industry through the university expertise should be established. For this purposes the consortium was been granted by Lifelong Learning Programme of the European Union (518987-LLP-1-2011-1-ES-KA3-KA3MP).

The OLAREX started at November 2011. The institutions from different EU countries (Spain, Lithuania, Austria, Bulgaria, Hungary, and Poland) are involved in the project. It is great important to announce, that teachers from secondary schools from all partner institutions already benefit from the first piloting sessions participating in the courses and modules designed during the project.

The aim of this paper is to present the results of the first training sessions organized in Olarex project and to discuss how Olarex facilitates integration of remote experiments in teacher professional practice.

The aims and objectives of Olarex project

The main project purpose is to innovatively implement ICT-based learning materials, remote experiments, and e-didactic methods into formal and non-formal lifelong learning settings. It will enhance and modernize science, technology, engineering and mathematics (STEM) curricula, foster student creativity and motivation, and develop professional skills and insights about the impact of evolving technologies.

The organized training courses for teachers, future authors of learning materials and modules, and museum employees will build the e-didactic competences in the STEM by providing remote lab work explanations, offering practically-oriented approaches for strengthening educational programs and technical practices.

During the training, teachers integrate at least one learning module into their curriculum, test them in their classrooms, and encourage their students to apply what they learned in a final project. The six comprehensive learning modules with remote experiments – in English and the national languages of the partners – have been prepared based on the target groups' requirements.

Learning and teaching materials have been incorporated in an e-platform with personalized learning environment. The remote experiments as a part of the OLAREX museum exhibition emphasize hands-on experience, and context-based learning, making this output a unique non-formal e-learning tool.

The whole process is being organized in the framework of Olarex project objectives which are the following:

- to define the school/academia ICT needs for knowledge and skills in the STEM;
- to build teachers', students', and museum employees' e-didactic competences in the STEM;
- to develop practically-oriented learning modules with remote experiments and integrate contents and functionality in e-learning portal;
- to enhance and modernize the teaching/learning tools and methods for formal and non-formal lifelong learning institutions;
- to initiate the school-enterprises linkage.

Needs assessment survey, 2012

The survey was performed in Lithuania, in March- April, 2012, to analyze the knowledge and skills needs requested from secondary school students; to analyze a demand on teacher competence development; to analyze a role of Administration staff in ICT integration in school curriculum; and to analyze e-learning materials and remote experiments needs and education methods.

Most secondary schools in Lithuania show interest in online learning and, remote experiments, but many of them do not have understanding on how remote experiments can be implemented nor have sufficient budget to get required equipment neither for online learning nor remote experiments, or to such systems administrators. Also schools usually have only one computer class with internet connection, because of that there is very limited time when students can access computers with internet.

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50 % of students use laboratories at school for experiments and 50 % of students don't use it. Students , who had or have laboratory experiments, evaluated their experience with words "strongly agree", "mostly agree", "neutral", "mostly disagree", "strongly disagree" – by answering on the questions:

- I better understand learning material with laboratory experiments.
- I eager to apply my theoretical knowledge in laboratory experiments.
- I like to interact with the lab equipment.
- I want to know/to learn more about the topic, after laboratory experiments.

The results are presented on the Figures 1. As it can be seen all students strongly agreed or agreed with these statements:

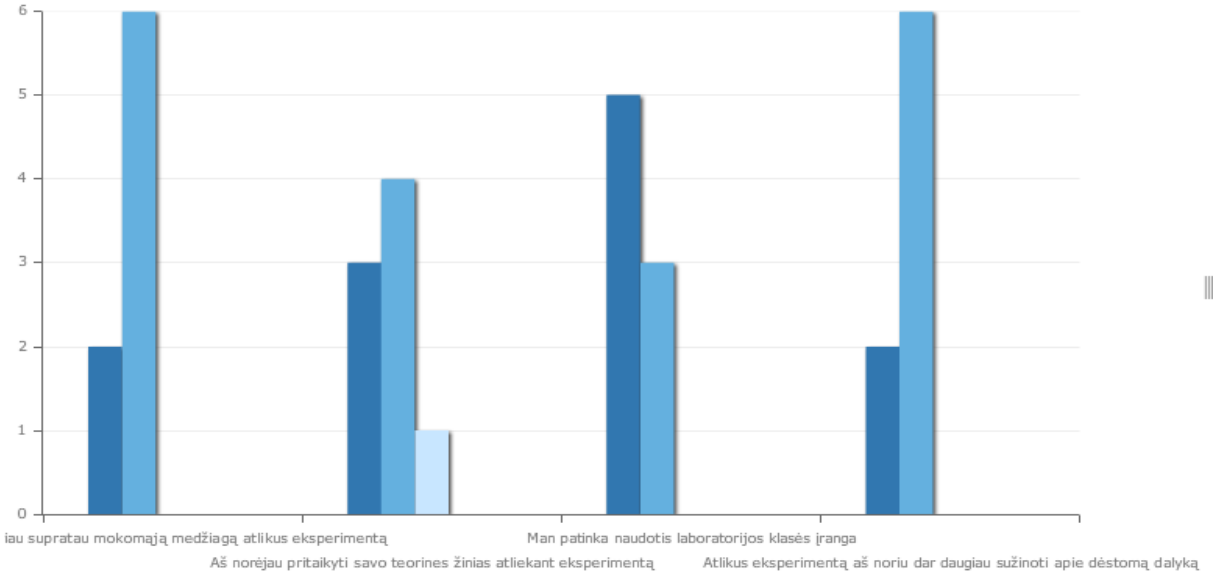

Figure 1. Experience and influence of practical laboratory experiments.

85 % of students have not heard of remotely accessible laboratories and only 15 % have heard. 35 % of respondents correctly provided the definition of the remote experiment – "The experiment on the real laboratory equipment to which users can get over the Internet". More than 80 % of respondents would be at least interested or totally interested in remote laboratories.

Teachers were another respondent group in the survey. In Lithuania, 22 teachers filled in the online questionnaire and responded that: 73 % of responders do not use a practical laboratory component currently in their curriculum, 23 % use it. Teachers who uses laboratory in their curriculum they answered that they use it in Mathematics, Biology and Technologies.

- Mathematics – most experiments are done in groups and demonstrated to students, some are done individually.
- Biology – most experiments are demonstrated to students.
- Technology – some teachers let students make experiments in groups and some are done individually.

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- Physics – all experiments are performed in group or demonstrated to students.
- Chemistry – some experiments are performed in group or demonstrated to students.

Other experiments are done variously, some in groups, some individually and some are demonstrated to students. 54 % of respondents said that they "have heard of remotely accessible laboratories before" and 46 % have never heard about remote experiments before.

Teachers were asked how they would be interested in remote experiments in their school. As it can be seen from diagram (Figure 2) most of the teachers would (87 %) be at least interested, fewer very interested and completely interested.

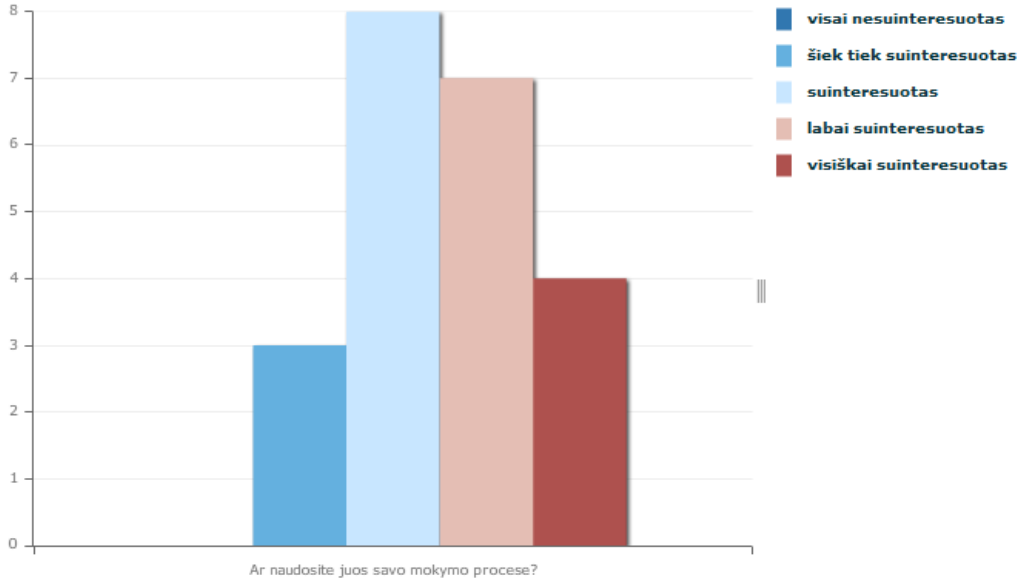

Figure 2. Interested in remote experiments

The main purpose of the study was to understand the ICT knowledge gap in countries. Based on the reports' conclusions the partners identified the methods, instruments and content approach expected ICT competence demands for the collaboration with the primary target groups: secondary school teachers, their students and museum employees. The profiles of teachers, students, administrative representatives and companies responding the survey is available at the project website at http://www.olarex.eu.

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Targeted results, 2013

5 courses on e-didactical competences for teachers and trainers were developed in Olarex project, namely:

1. Empowering education: How to choose ICT instruments and applications for the purpose of your curriculum.

The course aims at developing the following competences:

1. adapt mobile devices in science studies and use computer supported experiments;
2. estimate the benefits of using virtualization, simulations and other web 2.0 and wiki;
3. be able to use applications in STEM education;
4. integrate remote lab-experiments in classroom;
5. learn to use EDMODO environment and Second Life application in the classroom.

2. ICT for presentational and educational activities in the museums E-course for museum specialists.

The course aims at developing the following competences:

1. apply more ICT's in organizing contemporary museum events and museum educational programs;
2. use gained ICT competences in professional activities for more efficiency of the team museum work;
3. use ICT – for preparing museum informational and popularization materials;
4. incorporate e-learning materials in realizing museum pedagogical work.

3. Designing Curriculum in Moodle, aiming at developing the following competences:

1. describe curriculum didactical designing process;
2. identify distance learning and teaching curriculum quality assurance criteria;
3. select and design Moodle structure appropriate for the curriculum designing in Moodle;
4. select appropriate web 2.0 tools and social media to be integrated into Moodle virtual learning environment.

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4. Transforming curriculum with remote experimentation: how to integrate it in secondary school classroom.

This course aims to develop the following competences:

1. use different types of online labs;
2. make the difference between different types of online labs;
3. present a remote lab to student.

This course is a very special one, which aims at 10 hour learning process distributed in 4 weeks plus implementation with school students one of the six STEM modules:

- Black body radiation of common light sources (apply Simulation tool) http://www.olarex.eu/web/images/olarex/modules/module_bbr.pdf
- Farm Experiment: From an egg to a baby chick, step by step (apply Remote Laboratory experiment) http://www.olarex.eu/web/images/olarex/modules/module_fe.pdf
- Working as a computer – Logic gates (apply Remote Laboratory experiment) http://www.olarex.eu/web/images/olarex/modules/module_lg.pdf
- Analogue circuits measurements (apply Remote Laboratory experiment)
- How does the current flow? (apply Remote Laboratory experiment) http://www.olarex.eu/web/images/olarex/modules/module_ol.pdf
- Easy Java Simulation for Phys&Sports (apply Simulation tool) http://www.olarex.eu/web/images/olarex/modules/module_js.pdf

5. ICT – Enhanced Research and Professional Development, aiming at developing the following competences:

1. explain the research process and the rules that guide it including the identification of a topic, preparation of a research proposal and final research report;
2. find background information;
3. cite an e-document using a standard format;
4. write and present a paper.

The developed learning modules are a primary help or tips-and-tricks instrument for implementation remote experiments in a classroom. Teacher can use its structure as a whole element without any changes, can apply some parts such as exercises, experiments, problems, or only ideas for topics for student final projects.

Based on the survey results we can conclude that there is a need in generally introducing the pedagogical and technical concept of remote experiments in participated countries. Mainly a large percentage of the students and teachers are not aware of the ICT application: remote laboratory, most of them do not even know the definition or the educational and technical concept behind. Therefore, more theoretical, informative material on that subject matter should be useful for presentation and access. At the same time the general interest is high regarding remote experiments. There are no doubts that this tool should be implemented in

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the school curriculum. Almost 100% of survey participants believe that remote labs can enhance the practical components of science curriculum in their schools.

The Moodle – wide-used learning management system – is used as a basis for OLAREX learning environment. It will be the primary place, where training courses will take place and learning materials and modules will be stored. The main tools of the application were tailored for the needs of the target groups. The installed video conference tool allows organizing live training sessions between OLAREX moderators and secondary school teachers, between teachers and their students as well between participating students. The plugin that integrates remote laboratories such as WebLab-Deusto, iLab, VISIR into the Moodle was developed and deployed.

Teacher training results

More than 250 teachers registered to OLAREX courses aiming to gain e-didactical competences and to integrate remote laboratories in their STEM subjects. As courses were designed in all partner languages, there were 30 versions of courses and 30 versions of modules all in all. Of course, as it was predicted, teachers chose national versions of curriculum, as they use national languages at schools.

All training courses and modules are presented in SCORM packages. Theoretical part and examples are provided to teachers for understanding how remote laboratories work and how to successfully perform experiment (Figure 3). After theoretical part teachers can perform experiment by their own.

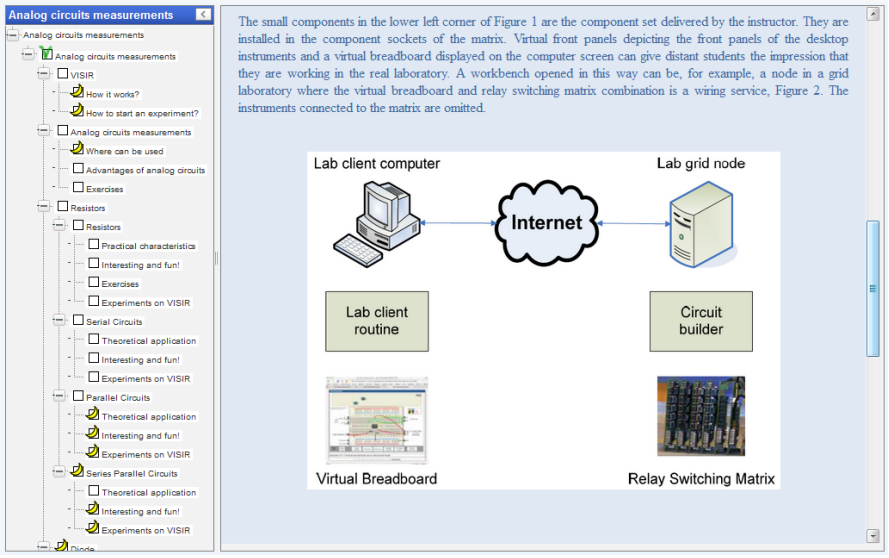

Figure 3. Theoretical part of learning module

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Experiments are performed in remote laboratories which can be access by internet using internet browser (Figure 4).

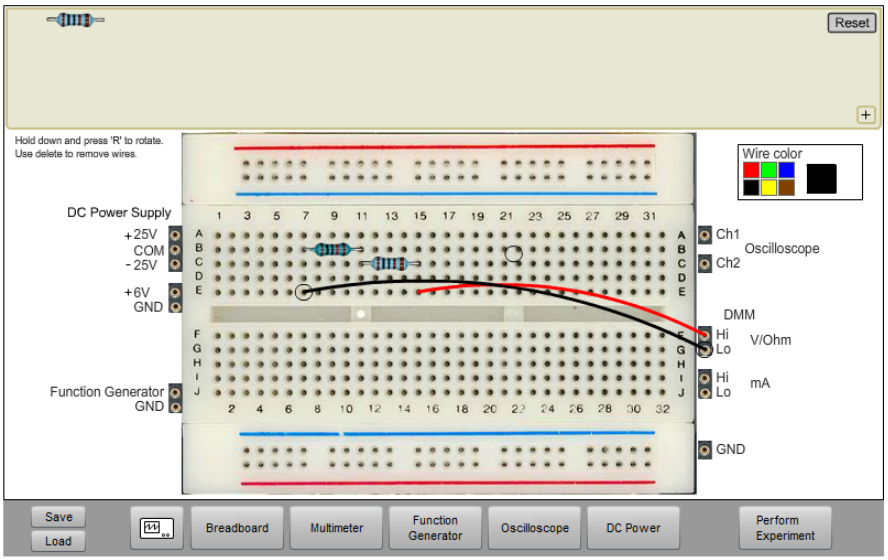

Figure 4. VISIR remote experiment laboratory.

Courses/modules participants were very active, most of them registered to more than 2 courses/modules and successfully finished them. Participants were also very active in discussion forums.

Most interesting was teacher feedback provided to course authors at discussion forums. They indicated that application of ICT increases motivation of students, better opportunities, teacher competence enhancement and collaborative group work. Teachers claimed that ICT cannot be applied in all study curriculum, but remote laboratories are most advanced tools that can be used at school, during hands – on practical classes. Integration of curriculum into Moodle virtual learning environment facilitates support and communication in terms of learning activities.

Conclusions

OLAREX project contributed to teacher training on how to use remote laboratories and to improve practice at secondary schools considerably. Teachers showed great interests in using remote labs at their classes.

Considerable effort was made by project consortium, and great appreciation was received by the teachers, to have both, training on application of remote labs, and having the context of ICT courses, training on integration of remote labs and facilitating teachers to do so. Consistent and very practical approach resulted in considerably high number of teachers who registered and completed the courses. Next phase requires their individual effort, but also motivation of teachers on the national and institutional levels. The future will reveal how these efforts will be met by local and national contexts.

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TRANSFORMING CONFLICT, TRANSFORMED LEARNING: COLLABORATIVE PEACE STUDIES AND ENGAGEMENT IN INNOVATIVE PRACTICE

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Background

This paper analyses the experiences structures, methods and techniques involved in deploying advanced technologies to support learning in the field of peace studies, reconciliation and conflict transformation. The catalogue of conflict and violence that covers human history can seem long and depressing, especially in contexts of ongoing and semi-permanent warfare and ethnic violence in many disputed global communities. At local and community levels conflict, attack and prejudicial behaviours are commonplace. For every element of conflict there are equal numbers of individuals, groups, communities and agencies that intervene to mediate, facilitate, adjudicate, resolve or overcome crises. Peace-making and conflict resolution schemes have sometimes been extraordinarily successful. Issues and tools developed around reconciliation, peace, mediation, justice and conflict transformation have often achieved positive and enduring results. This produces challenges in designing and developing the courses, methods and techniques that can enable conflict transformation specialists and practitioners to be best equipped to deal with the many difficulties and obstacles that lie in the way of effective peace creation. The availability of ICT supported learning mechanisms has allowed the construction of novel and engaging courses that enable conflict resolution specialists to acquire the analytical, methodological and applied skills to make a significant impact in the zones in which they work.

This paper looks at two contrasting approaches that have been deployed for students using distance and supported learning, coupled with a strong e-learning support network for frontline community conflict resolution specialists. It does this through comparative analysis of international best practice using two models of courses that have engaged learners in Catalonia and Northern Ireland. Learners come from diverse backgrounds and experiences to engage with materials, methods and topics that are often traumatic or highly contested. The learning design imperative is to provide methods and content that neither intimidate nor humiliate but rather provide exciting frameworks for exploration, understanding, engagement and sustainability change and/or transformation.

Learning Design in Conflict Environments

The overarching aim of conflict learning and peace studies is to give an overview of the issues and themes of conflict transformation in the context of post-conflict relationships, trust-building and the dynamics of reconciliation.

This is designed so that participants will eventually:

1. Have an understanding of the historic legacies of conflict
2. Develop an appreciation of the issues underlining pain, loss and anger arising from conflict
3. Be able to explore the key components of conflict transformation
4. Be able to appreciate the key elements in restoring dialogue and mutual acceptance
5. Be able to define the elements in creating trust and conflict avoidance.

In all such programs and courses issues around conflict and peace are considered in a matrix of critical reflection and shared learning. The importance of historic enquiry is an essential element both in terms of explicative clarity but also in terms of restorative justice and rights. Developing encounters with the sources of conflict – and in some environments with former protagonists – can be exceptionally difficult. The importance of memory, pain and healing is a critical aspect of conflict resolution work. These dimensions can be supported by e-learning methods, where material and information can be presented in a neutral manner. Virtual and electronic communication may often be preferable to face-to-face encounters. Research materials and scenarios for discussion can be presented asynchronously as well as synchronously, thus enhancing the richness of the student's experience. The critical advantage lies in providing a forum for ongoing dialogue and sustainability of learning outcomes.

The analysis of conflict presents both objective and subjective features. Sequencing of modules permits students to engage with topics or issues in as neutral a manner as possible. Nonetheless, discussion of contentious issues is a necessary aspect of developing the understanding, knowledge and skills that practitioners (or indeed former combatants and victims) may need in constructing not simply analytical models but viable alternatives to conflict that attract wider community support and policy responses.

The end of any conflict situation may come about for any number of reasons: victory, defeat, agreement, exhaustion, mutual destruction or external intervention. Whatever the circumstances, certain features are universally reported by those who have either been involved in conflict or have been affected by it. These features cover a range of feelings and perceptions that reflect the legacies of violence. They can be critical factors in shaping the attitudes of students who themselves have been involved in conflict related events. Conflict study is not a linear process from problem to resolution. Its convoluted trajectory must therefore be matched by the learning design, which captures and reflects the contradictory

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and often emotionally challenging dimension of study. The enduring legacies of violence are complicated and difficult. Its features may include:

- *Futility*: a sense of uselessness regarding the causes, course and processes around violence and conflict.
- *Worthlessness*: this is a feeling reported by both survivors and combatants alike, a sense they have no personal value and life has no meaning.
- *Regret*: remorse for what one may have done – what seemed justifiable in conflict, on reflection may seem appalling.
- *Hurt*: enduring senses of loss and dismay, a sense of sheer psychological pain and distress.
- *Bitterness*: a sense of abiding resentment.
- *Rationalization*: acknowledging loss or harm, contextualized in a sense that awful things happened for a purpose.
- *Unrelenting memory*: a sense of complete inability to either forgive or forget - a constant reminder of loss or violation.
- *Self-hatred*: many of those involved in conflict and war strong feelings of self-loathing and self-reproach.
- *Wariness*: the sense that one can never trust again.
- *Confusion*: an awareness that one participated in something without understanding, having been swept up in events.
- *Determination*: a strong sense that there must be a better way and that such events must not be allowed to ever occur again.

Peace and conflict studies first emerged in the nineteenth century, largely as a response to the analysis of the impact of war (and in the United States to the trauma of Civil War). But it was only in the twentieth century, in reaction to the mass slaughter of the First World War that formal courses were initiated. The major developments have been since the end of the Second World War and, in particular, following the impact of the war in Vietnam. As an academic study, peace and conflict studies have emerged in the social sciences and are closely connected to issues around social justice, mediation, intercultural engagement and diversity. In almost all courses, there is a dual emphasis on both analysis and on application. By nature multidisciplinary, peace and conflict studies have responded to contemporary issues while also attempting to provide a general theoretical overview of the causes and roots of communal violence, as well as suggesting methods that address or ameliorate conflict. By 1995, some 135 universities in the United States were offering courses in peace and conflict studies (Harris, et al., 1998).

The development of advanced ICT support for courses and the adoption of e-learning have proved a challenge and opportunity for this field. Peace and conflict studies represent an extraordinarily wide and diverse set of issues and topics. The development of social media instruction supports and web-enhanced programs has also allowed direct engagement of those who have been directly affected by conflict and post-war settlements to input directly to

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discussions and research. This in turn has produced a complex and diverse cyber-environment in which to consider the causes of and responses to conflict (Galtung & Jacobsen, 2000). The *Peace and Collaborative Development Network* is a vast online community addressing exactly these issues and concerns, and acting as a signpost for the courses (and vigorous debates) that surround the entire field. As of 2013, PCDN had over 28,000 active members. This professional development network also provides for over 17,000 discussions, 8,000 blogs and a vast electronic repository of peace and conflict related literature and resources.

Comparative Practice – Catalonia and Northern Ireland

The *Master in Conflictology* is a flagship program of the **Open University of Catalonia (UOC)** and its Campus for Peace, Cooperation, Development and Sustainability. The Campus for Peace was created in 2000, coinciding with the International Year for the Culture of Peace by UNESCO. The aim was to provide the methodology and knowledge generated by UOC in the service of peace, human rights, humanitarian aid, sustainability and literacy through the Postgraduate International Institute (IIP) with a wide range of accredited modular programs delivered in distance format. The Campus for Peace combines academic and research networks (working collaboratively with the *School for Cooperation* and *Center for Research and Studies in Conflictology*), web resources and alliances (UNITAR; *Public Security Institute of Catalonia*; *Journal of Conflictology*).

The proposal originated with the former President of UOC, Dr. Gabriel Ferraté. He envisaged a campus focus on peace and conflict studies, to be provided by the advanced ICT and e-learning methodologies and cooperation that were the hallmark of the University. The Director of the Campus for Peace and the School of Cooperation, Dr. Eduard Vinyamata, had worked extensively with refugee camps in Bosnia, and had begun to formulate ideas on how new technologies could improve living conditions of people living in critical situations. The opportunity to blend these concerns and objectives with the advanced virtual systems used by UOC gave a practical foundation to the original vision. Thirteen years after its foundation, the Campus for Peace has consolidated its virtual training. Its activities on cooperation and development through e-learning have become a tool to solve humanitarian problems with tangible approaches, pragmatic and directly related to universities, NGOs and local governments '*to intervene directly, firsthand, in war and in conflicts with scientific knowledge of conflicts, violence and crises using methods that do not contradict its objectives, i.e. non-violent and peaceful. And the aim is clearly to end violence achieve reconciliation and be able to live in peace*'. (Vinyamata, 2010)

The *Centre for Research and Studies in Conflictology* (CREC) combines international and multidisciplinary research on human conflict and its resolution through non-violent approaches. CREC integrates experts from different scientific disciplines. The aim is to contribute to understanding and resolution of human conflict from an evidence-based knowledge and to generate an international academic network that can influence conflict

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policies and address contemporary social challenges. The *Resolució de Conflictes* website is the portal for specialists, facilitators and mediators involved in conflict resolution. It enables professional training and experience for the sector and facilitates professional collaboration in both distance and face-to-face encounters. The *Journal of Conflictology* is the biannual magazine in English about interdisciplinary study of peace, conflict, nonviolence, mediation and alternative systems of justice. The School collaborates with prestigious institutions (Red Cross, Engineers Without Borders, Amnesty International, UNITAR, UNDP, UNESCO, the World Organization of the Scout Movement and the FC Barcelona Foundation). A wide range of international agreements exists with universities in Africa, Asia and Latin America, as well as specialist international organizations. The training courses provided by the Campus for Peace engage over 3,000 students from around the world each year. The Campus involves more than 200 teachers and provides an extensive range of courses.

Training in conflict resolution has experienced significant demand. The multiple possible applications are key to the success of several studies on demand for conflict resolution offered by UOC's International Graduate Institute. This includes the first general International Master in English, launched in 2009-2010. Taught in on-line format, the course is designed to meet the learning needs of a wide spectrum of learners and stakeholders.

The Master in Conflictology program groups, systematizes and presents knowledge through an effective and advanced on-line pedagogy developed by UOC. It gathers practitioners, academics and professionals from other collaborating universities and peace research institutes from different countries around the world. This facilitates access to the international Master and enhances preparation for professional practice in applied contexts dealing with conflict situations. This program trains students in all applications of conflictology (family, trade, social, political, international and armed conflicts), facilitates internships and prepares research programs. The average age of students in the UOC program is 35. They are usually highly motivated people with experience of change and engagement, with a developed and shared experience with colleagues anywhere in the world via the Internet based learning on offer. The UOC students obtain applied knowledge virtually. In addition, the program offers practical studies in the field of conflict since 2010. A series of practicum experiences has been arranged in Guayaquil (Ecuador), and there are also agreements with the University of Chiapas on placements and applied research visits. A significant proportion of the student cohort is comprised of community operatives, mediators, politicians, diplomats and soldiers, all with direct experience of conflict situations. Students, having developed a virtual community and skills in online materials, then implement their final projects in their respective jobs.

Expac (Ex-Prisoners Assistance Committee) developed the ***Conflicts of Interest*** course with support from the European Union under the Peace II and III programs. Expac originated as an assistance and support group for former prisoners, primarily Irish Republican political prisoners. It developed a range of training and project support interventions around investigation of the historic causes for Irish conflict, especially in regard to the most recent

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conflict in Northern Ireland (1969 - 1994). Expac also developed multimedia materials and extended its course offerings to consideration of European and international conflict zones with engagement of an Academic Coordinator in 2006. Accreditation was secured from Queens University Belfast in 2010. The course aims to give participants an understanding of the nature, causes and characteristics of social violence and conflict and an appreciation of the means and techniques to address root causes of conflict and dispute within a framework of conflict transformation, mediation, dialogue and transformative action. The course is rooted in a framework of mutual respect, historical investigation of identities, shared action and human rights. The overall aim of the Course is:

- To give participants an overview and insight into the underlying causes of conflict
- To help develop a culture of justice and human rights
- To better equip citizens to play an active role in peace building.

Originating in the lessons and experiences of those affected by the conflict on the island of Ireland over many centuries (and particularly in relation to the conflict in Northern Ireland from 1969 and its origins), the course seeks to develop the skills, knowledge and awareness of participants by parallel analysis and investigation of conflict in other parts of the world, with particular reference to examples that include the Balkans (with specific reference to conflict in former Yugoslavia), the Iberian peninsula (with specific reference to Catalonia and the Basque Country), South Africa and the European Union itself.

The course is based on a combination of taught modules, multimedia presentations, group work and analysis of case studies. The methodology is driven by an adult education approach where learners are treated with respect and where responsibility for learning rests with the individual. Participants are encouraged to learn, explore, question, challenge and share in an atmosphere of trust, confidentiality and support for individual learning styles. The course is delivered in a flexible but structured manner. The eight modules combine practical and theoretical inputs structured around a dynamic delivery style. Core modules include structured inputs from the Course Tutor and academic coordinator, supplemented by guest lecturers for each module. In addition, extensive use is made of archival film and other interactive learning materials. Guest lecturers represent a wide range of experience of those who have either experienced or analyzed conflict and community violence. The *Conflicts of Interest* course is delivered in eight modules, which cover theoretical analysis, human rights based approaches, mediating techniques and specific case studies.

Expac has developed these modules with the support and inputs of Universal Learning Systems. They reflect the academic experience of ULS over its many years of experience working internationally in contexts of social inclusion, academic research, conflict transformation and human rights. Expert external speakers are selected for their experience of conflict, personal backgrounds, diverse points of view and track records in terms of analysis or witness. They represent the authentic experience of conflict in its many dimensions. They are expected to go beyond a mere script and hold independent opinions which participants are

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free to accept, reject or modify as they choose. Guest lecturers represent those involved with politics, the community, peace building or academia.

Participants are encouraged to explore and debate the various issues and themes covered by the modules. Strong emphasis is placed on the analysis and development of skills useful for addressing conflict resolution and development of collaborative and cooperative approaches to issues around conflicting identities, dispute and shared social structures. Participants are encouraged to explore and share the culture and values of their own and other communities and to articulate a sense of engagement with the issues and themes that underlie conflict. Since the establishment of the Course in and its delivery since 2006, hundreds of participants have completed the program. They come from all communities in Northern Ireland, the border counties of the Republic of Ireland and from community groups in England. Significant linkage has been established with other communities and educators in various parts of the European Union (especially Greece, Spain and Finland) and the United States.

Complementary Dimensions – deploying ICT Supported Learning

The demand for course specializations, in both the postgraduate UOC peace programs and *Master on Conflictology* is high since the School for Cooperation provides professional knowledge areas that address the professional development needs of peace and conflict workers internationally. These areas include, for example, specialties concerning family conflict, education and employment. Use of e-learning has enabled considerable increase in the reach and scope of the courses and programs on offer and with enhanced accessibility and relevance to professionals in the field.

In *Conflicts of Interest* courses, certification options are available for those participants who wish to access them. Those who do will be expected to place a more formal emphasis on reflection, recording of learning outcomes and presentation skills in terms of a final learning activity. The significant contrast with UOC programs lies in the fact that the majority of course participants have themselves been involved in paramilitary activities or have been engaged in the political and social struggles associated with the northern Irish conflict. As the course has broadened its appeal to other academic and professional sectors, new pedagogical demands have been identified. One is the development of follow-on programs (a new course focusing on future conflict resolution strategies, *Future Resolutions*, was launched in 2012). The issue of distance learning has evolved also – a new e-learning platform, designed in association with Queens University Belfast is being employed in 2013. As of now, this is a basic e-reading and support platform.

The two courses and programs under consideration in Catalonia and Ireland reflect different needs, traditions and expectations for different target student cohorts. But what they share is a need to engage communities affected by conflict and professionals involved in conflict resolution alike in pro-active and transformative ways. This of necessity will require a rigorous focus on personal testimony, critical reflection and shared learning – all of which underline

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the transformative insights required to develop sustainable conflict transformation in the longer term. How e-learning can capture and extend the emotional as well as pedagogic demands of those on journeys of reconciliation remains to be seen. In that context, collaboration and partnership between programs such as these point an interesting path for ongoing exploration.

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"CAN SCHOOL ACTUALLY BE MORE DIFFICULT THAN THIS?" PERCEPTIONS OF NIGERIAN STUDENTS ON HOW TO SUCCEED IN ONLINE INTERNATIONAL POSTGRADUATE PROGRAMMES

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Summary

This paper aims to present learner perceptions on successful online learning from the perspective of Nigerian students currently enrolled in or graduated from the online international postgraduate (master and doctoral) programmes of the University of Liverpool, delivered by Laureate Online Education. Success in e-learning is regarded as reaching tangible goals and passing the required academic milestones in order to graduate from the programme and receive a master or doctoral degree (Beaudoin et al., 2009; Amadi, 2011).The paper presents the findings of a qualitative phenomenological study (van Manen, 1997; Crotty, 1998; Creswell, 2007; Mason, 2012) from the standpoint of cultural anthropology (Hall, 1996; Hannerz, 2001; Coleman et al., 2010) pointing at the Nigerian cultural context. The study includes socio-economical status, gender- and ethnicity-related questions that may have an impact on learner success in online education. After the analysis of cultural components, the article presents the perceptions of Nigerian adult learners on the profile of a successful online student, and it also explores the proposed 'how to' for succeeding in online programmes whilst living and working in Nigeria. The findings are based on semi-structured interviews with 17 Nigerian students and a focus group discussion with 12 graduated Nigerian students.

Online study cannot be viewed as detached from the local context, which includes the family environment and the challenges that individuals are exposed to within the Nigerian society. Residents in Nigeria have to face a series of external difficulties, including electricity shortages, internet connectivity problems, political unrest and strikes, as well as being tied to strong cultural values, such as the importance of family when making career-related decisions (Beckloff, 2008; Adekunle, 2007) or gender roles (Ango, 2011; Ogbogu, 2011; Nwadigwe, 2007) influencing the set-up of priorities and the allocation of study time. Based on their personal online learning experiences in the challenging Nigerian cultural context and noticing the differences between Nigerian face-to-face and online learning methods students constructed the prototype of a successful online learner, who is organized, dedicated, disciplined, expert in time management, avoids burn-out, has personal motivation and support from the family and work environment, enjoys hard work, flexible and open to learn,

reads, interacts and performs, use internet as a tool for education and fights tirelessly the negative social aspects and the local challenges of his/her country.

Methodology

The findings are part of a wider research project that focuses on the online learning experience of Nigerian students and follows phenomenological principles (van Manen, 1997, Crotty, 1998, Creswell, 2007, Mason, 2012) in the research design. 17 Nigerian students were interviewed and 12 participated in the focus group discussion. The participants are enrolled or graduated from the online master and doctoral programmes of the University of Liverpool delivered by Laureate Online Education. The semi-structured interviews were organized either face-to-face or via Skype; the focus group discussion occurred in a face-to-face event in Liverpool. Participants are in their 30s' and 40s' and the majority live in the Southern regions, some in the Northern part of Nigeria. The interview structure pointed at three main topical areas: cultural values at home, online learning experience and face-to-face learning experience in the Nigerian public higher educational system. The interview and focus group protocol covered the following set of questions related to the circumstances of their online learning experience and the characteristics that they attribute to a successful online learner:

- What is your experience with online learning?
- How could you describe the conditions, contexts, situations that affected your online learning experience?
- What feelings come to your mind when thinking about online learning?
- What meaning does online learning in your life? What are your goals with online learning?
- How could you describe a successful online learner?

The interviews and focus group session were transcribed and analyzed with rigorous phenomenological research methods (Hycner, 1985; Ajjawi & Higgs, 2007). Summaries were prepared from the transcripts for data validation purposes and sent back to the participants who gave their consent or suggested small changes via email. The transcripts were coded in NVivo and the eventual bracketing phase started with the identification of units of meanings categorized in themes and sub-themes. Continuous self-reflection, cultural self-awareness, regular consultation with experienced researchers in phenomenology and cultural studies as well as frequent cross-checks with the critical literature secured faithfulness to the data.

Differences between Western-type Online and Face-to-Face Nigerian Education

The concept of Western-type education indicates teaching and learning methodologies used in Western European and North American cultures, where the programme design and structure reflect Western way of thinking, learning, and teaching even though many online education providers look at the class content and consider to a certain extent the multicultural

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nature of the e-learning environment (Beckloff, 2008; Anderson, 2008; Moore, 2006; Bassey, 1999). The limited paralinguistic components, the absence of body language in online communication and the usage of communicative tools that are not very effective in Western-type online educational environment may lead to misunderstandings or misinterpretations of learning situations in the peer-to-peer, peer-to-instructor interaction in the online class (Uzuner, 2009; Anderson, 2008).

The findings of the research demonstrate that one of the biggest challenges of Nigerian students at the beginning of the online programme is how to adjust to the online learning method and the different teacher model, which is new for most of them. In Nigeria teachers have a central role in the learning process by interpreting and transforming the content into teachable lesson and are considered the source of knowledge for the student (Olaleye, 2011). However in the online learning environment instructors are considered facilitators of the learning experience, whilst students are the centre of knowledge via self-study and active participation (Seckel, 2007; Anderson, 2008). During the interviews, a Nigerian student grasped the difference between the online learning methods and the Nigerian face-to-face learning environment by focusing on the participation component: although in traditional universities physical attendance is required, the participation can be relatively low during the class and the formal assessment occurs in the final exam, which determines if students pass or fail the subject. In the online university there is no possibility to be hidden and active participation – "reading, interacting and performing" (Student 9) – are key elements for learner success:

> *"A successful online learner has no choice but to read, interact and perform. They have to be consistent. If [the] attendance is registered, face-to-face learners need to show up. If [the] attendance is not registered, they do not need to show up. They can hide." (Student 9)*

Self-study, reading and transforming the information into knowledge, active participation, critical thinking and discussion are skills that an online learner masters in order to succeed (Moore, 1973), whilst the more authoritative, teacher centric Nigerian teaching methods do not necessarily support independent learning.

Local Challenges: Political Unrest, Strikes, Electricity Shortage and Internet Disconnection

Depending on the area students live in Nigeria, online schooling is challenged by different factors. The North of the country is charged with terrorist activities and political unrest, a circumstance that cannot be ignored when one tries to succeed in his/her studies. The terrorist activities that students witness in the North, are attributed to the Boko Haram terrorist sect, that showed up with devastating bomb attacks, suicide bombings and roadside shooting in North-Eastern Nigeria in 2009 and since then have been spreading a series of ferocious and violent atrocities further to the North-Central and Southern regions (Bagaji et al., 2012;

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Maiangwa et al., 2012; Musa, 2012). Especially Christian students living in a politically unsafe area encounter major difficulties to "maintain a normal life in this environment, let alone schooling online" (Student 1):

> *"When there is no peace, no rest of mind, you tend to lose concentration [...] You are not really stable psychologically and emotionally, you have to stop, you are affected." (Student 1 MPH Programme: Christian Yoruba student, in minority in North-Nigeria in the time of the interview, failed a module due to the political unrest and planned to move to the West of the country)*

The interviewed students living in the Southern regions (mainly Yoruba and Igbo students) were not affected personally by the terrorist attacks, and their studies were not interrupted for such reasons. However they were challenged by other factors: the regular electricity shortages and internet connectivity problems are multilayered issues in Nigeria and are due to energy loss, inadequate infrastructure and funding of the sector (Chinwuko et al., 2011; Opara & Okarafor, 2011). Online education providers must be well aware of the problem: rural areas are not equipped well for a 100 % online course. Low speed internet, internet disconnection and unstable electricity cause major challenges in remote areas of the country and many times also in bigger cities, which leads to frustration and demotivation among Nigerian students. Successful students buy generators to secure stable electricity, but even if they invest in generators and sign contracts with 3-4 internet providers, a sudden petrol strike can destroy the careful and costly plan to prevent late submissions and lack of participation in the virtual learning environment:

> *"In Nigeria the main challenge is electricity. I think it's still a determining factor as to how successful or unsuccessful certain students are. [...] It is so easy to lose your passion, to lose your drive for a course that you wanted to study. Because all those influences break you down and each time you're broken down, you're taking time to heal and mend the pieces, something else happens." (Student 6)*

Others move to 5 stars hotels (Student 15) to make sure the internet connection is secured, but not many students can afford to spend couple of days a week in luxurious hotels, or pay the expenses of additional generators and internet providers, because the programme is very expensive for most of them. Such external factors contribute to student motivation or demotivation towards continuing or discontinuing online studies, and it is one of the main reasons why students drop out from online courses (Sofowora, 2012).

Family, Gender Roles, Work and Online Learning

Nigeria is a multiethnic and multicultural country with approximately 350 different ethnic groups, each with different cultural heritage (Medubi, 2010; Agulanna, 2010; Adekunle, 2007). The three dominant ethnic groups are the Yoruba, Igbo and Hausa, and two third of the

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interview and focus group participants belonged to the Yoruba ethnicity, dominant in South-West Nigeria, where the infrastructure and internet connection is more stable, therefore more adequate for online studies. From the stand point of cultural anthropology, culture is seen as "meanings that we create and that, in turn, create people as members of collectivities" (Coleman et al., 2010, p.7.). Yoruba participants who lived in Nigeria developed strong ties to Yoruba cultural values. In the Yoruba culture family has an important role in the individual's life especially in life changing decision, such as education and career choices (Beckloff, 2008). Family is considered the centre of social organization, where the acculturation and socialization of the individual take place (Adekunle, 2007). Students explained that without supporting family they could not complete the programme and especially female students reported major challenges with balancing their responsibilities as mothers, wives, daughters with their daily job and online studies.

> *"He [other participant in the focus group] mentioned that when he was expecting a baby, he made sure he did not register. And that is a very cultural concern because he knows there is no excuse for you not attending the naming ceremony. Family members are going to walk around and smelling around the whole place. There is no excuse like: 'Look, I want a piece of quiet'. So, culture comes in there, big time." (Graduated, female student from the focus group discussion)*

Every student reported challenges with balancing their private and professional lives, however there are differences between men and women in terms of the nature of the difficulties. Adult male students feel the pressure of family and work when coping with their online studies, but the social environment has generally supportive attitude towards their career aspirations and educational responsibilities. A male interview participant was laughing when explained that his wife kept showing funny faces whilst he was talking to the interviewer by phone; a gentle sign for dinner that student 12 skipped in order to participate in the interview. He added that usually this is what happens when he studies: he does not have time to his family and they have to accept it.

Others also reported that sometimes they 'play on the nerves' of their supporting wives:

> *"I got married on 14th February. On 15th February I was in Dubai for my honeymoon and I had an assignment to submit on 15th February, so I left my wife in the hotel, headed out to the [internet coffee] to wrap up and submit [the assignment]. I didn't come back to the hotel [for] four-five hours and my wife was mad… Very mad… (Laughter) So, it took a while for my wife to understand that and accept that absenteeism." (Male student from focus group session)*

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The focus group participants were all laughing when listening to this example. It was indeed funny, and it was assumed that wives understand such situation. However female students have more complications in terms of not being always supported by the surrounding society, and often fight with stereotypes with regards to the traditional role of women in the Nigerian society (Ango, 2011; Ogbogu, 2011; Nwadigwe, 2007). Being an educated woman may create tensions with the social environment, in terms of balancing student responsibilities and respecting the cultural framework that expects women to be first wives, mothers, and daughters before being online students. "A woman still looks after her family and do a lot regardless of the fact that she is doing the online course" (Student 9):

> *"I think that in Nigeria women are still subservient to men. Even if a woman is more educated than her husband, in fact she's put under pressure not to show it. She has to obviously [treat] him with due regard, and not treat him as an equal. The very fact that she's successful means that she even has to work harder to be more humble because she's maybe misunderstood. Not necessarily just by her husband but by the society: 'Oh she's very puffy, she's very conceited, she's educated!!.' [with ironic tone] They might even speak to your husband and say 'Oh your wife, she's becoming very puffy isn't she?...She's so rude because she is educated… We don't want to know. When she enters this house she's Mrs you, not whoever she thinks she is as an individual.' So you are aware of that… You work harder to be humble and not blow your own trumpet." (Student 9, graduate female student, living in the UK, MPH Programme)*

The findings show that students are exposed to their own cultural milieu and socio-economical context in their micro and macro society, which create challenges that are partly or entirely unknown for students living in Western countries. Hence the prototype of a successful online learner in Nigeria may have differences from the profile of successful learner in Western countries.

The prototype of the Successful Online Learner

Considering the difficulties in their local environment and the online learning method (Anderson, 2008), which is different from the traditional Nigerian learning environment, students constructed the profile of a successful online learner. Based on the phenomenological data analysis the following patterns emerged as main characteristic of the successful online learner who lives in Nigeria:

- Able to balance professional and personal life with academic learning:

  > *"Successful online learning is the ability to balance your professional and personal life with the academic learning and showing that none of them suffer." (Student 3)*

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- Has light and internet:

  "If you know you're studying hours you've put aside for your studies, you have to make sure you have light and internet at this time. The facts are really simple; you just need to be consistent with it and you need to be sure you're not cut off." (Student 5)

- Self-motivated, disciplined and focused:

  "Self-motivation, discipline and being focused, knowing what you want and going for it, will make you succeed." (Student 1)

- Flexible to a different learning environment:

  "A successful learner is someone who is able to adjust, flexible to a different learning environment and able to make use of the feedbacks he/she has received from the institution, able to use that information to better him or herself, to achieve the desired academic ambition." (Student 14)

- Has cultural intelligence:

  "You must have some cultural intelligence; able to deal with people from different cultures and respect them, who they are. […] You must be able to communicate effectively with them [online classmates], without being seen [as someone who is] looking down at someone else because he/she cannot write proper English." (Student 2)

- Understands the content and puts it in own context to avoid plagiarism:

  "It's not just being able to read and dictate what you read. To be successful you have to understand and you have to put it in your own context and your own words to avoid plagiarism and also to get other people's attention." (Student 17)

- Has support from family:

  "I discovered my wife; the one that I have; the mother of my children; fantastic woman who has been giving me [support] from the beginning of time. And I am grateful to her." (Student 15)

- Has support from employer:

  "They were very good to me. Every time, [when I had to] do my end-of-module submission, I always had to take a day off. And they were always fine with it." (Student 10)

- Knows how to use technology:

  "You must know how to use and be flexible with technology." (Student 2)

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The findings show, that in order to overcome the "shock of your life" effect (focus group), students associated successful online learning with good time management, technology and speed-reading skills. In terms of the academic performance reading, understanding, translating knowledge into own context, interacting and performing were the success factors for Nigerian students in online international postgraduate classes. In socio-economical context political circumstances, family, financial and technological support influenced the success of their online studies whilst living and working in Nigeria.

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THE MOTIVATED, THE ENCOURAGED, AND THE WILFUL IGNORANT

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Introduction

Some semesters ago, we had two excellent Chinese guest students at our university who passed all exams with high scores except one, in which both failed. The significant difference between the failed exam and the perfectly managed others was that in this failed one, the students were asked to take a critical position against the taught contents. If we had foreseen their culturally specific reaction, we could have prepared them regarding our both countries' different concepts of learning (critical examination vs. reproduction) and understanding of respect towards instructors (consulting/guiding instructor vs. person of authority): In this particular exam, the students refused answering because they feared to offend their lecturer when criticizing him or his choice of contents. After a short discussion of the theoretical background of this paper, we will come back to the issue of this example.

In e-Learning scenarios, learning is understood as a self-directed process (Rey, 2009, p.33). Schwartz and Bilsky, (1987, p.552) describe "self-direction" as referring *'to reliance on and gratification from one's independent capacities for decision-making, creativity and action*'. Konrad and Traub (1999, p.13) introduce „*self-directed learning*" as a form of learning, in which the learner (depending on the kind of his motivation) decides himself which methods are to be taken in order to check, control, and evaluate the own learning process. Lenartowicz and Roth (2001, p.311) write that '*self-directed individuals rely on themselves for achieving desired outcomes.*'

In such a self-directed educational scenario, a constantly high level of motivation is the most crucial success factor (Richter & Adelsberger, 2011, p.1603). If learners lose their motivation in a face-to-face scenario, the educator still has a chance to recognize it and to intervene and support the regain of motivation (Rothkrantz et al., 2009, p.1). In e-Learning scenarios, this chance rarely is given; without recognizing the learners' mimics and gestures as tools to communicate satisfaction or frustration (Sandanayake & Madurapperuma, 2011, p.72), the instructors depend on the explicit communication of threats against the motivation of the learners. Ways to achieve a bit more control over the level of motivation of the learners are monitoring their efforts (Jain, 2002) and/or keeping their motivation on a high level by providing a learning situation that does not jeopardize the learners' pace.

While there is a high number of publications available which theoretically and experimentally investigate the questions what learners understand as being motivating and which activities raise motivation (e.g., Dörnyei, 1994; Williams & Burden, 1997), research of influences that lead to decreasing motivation is rare. Nilsen (2009, p.546) argues if raising motivation should be put above preserving the initial motivation of learners. In his study (2006), Nilsen found that the main reasons for students' dropping out were ineffective study strategies, a mismatch between expectations and content in the study-program, and a lack of motivation. Bowman (2007, p.81) even claims that strong efforts should be made in order not to 'destroy' the initial motivation by confronting the learners with unnecessary conflicts. Following Haberman (1995, p.22), it is not in the responsibility of the learners to adapt the given conditions of their learning context, but the educational institutions' duty to ensure that an environment is provided that leads to productive learning for any kind and type of learner.

Regarding the treatment of the learners' motivation, parallels to once common practices in the health-care sector appear to exist: As long as a learner is considered being *motivated* (healthy), nothing is to be done. If a learner shows symptoms for loosing motivation (acutely ill), he is being *encouraged* in order to bring him back on track. Once a learner is considered having become *wilful ignorant* against motivation-supporting efforts (chronically ill), no particular activities to solve the problem are taken; instead, symptoms are combated, e. g., bored learners in classrooms are demanded not to disturb others or are "simply" excluded. For the sector of health care, this model can be considered being more or less out-dated, as many health policies implemented programs to strengthen and preserve health, e.g., through fostering sportive exercises, raising peoples' understanding of healthy nutrition, and setting up programs to avoid/deal with stress. Transferring this change from reactive to proactive health care (Menne, 2005) to the educational sector would mean to strongly support initially high-motivated learners not to loose their motivation. In order to get a better understanding of factors that could jeopardize the learners' motivation in intercultural learning scenarios, we implemented the standardized questionnaire 'Learning Culture'. In the context of this questionnaire, we asked learners' regarding their attitudes towards motivation. In the following, we briefly introduce the questionnaire, the setting of our bi-national study, discuss results, and take conclusions.

Operationalization

We analyzed the literature on reported conflict situations in international and/or intercultural learning scenarios. Additionally, we held informal interviews with students in Germany and South Korea in order to find additional (yet unreported) influence factors that, from the students' perspective, cause conflicts in their learning processes. The results of both eventually led to the operationalization of our 'Learning Culture' questionnaire.

Regarding motivation, we firstly wanted to understand how students assess their motivational predispositions towards outer influences. Secondly, we were interested in answering the question why students learn and thus, which expectations regarding the taught contents they

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may have. Thirdly, the students' strategies towards difficult and/or unmanageable tasks were focused. In the interviews, we found that some students considered the latter aspect being most discouraging. We were of the opinion that if instructors understand those three types of influence factors from the perspective of the students and additionally, are aware of possible cultural differences, they could improve their support in order to foster and preserve the students' motivation on the one hand and on the other hand, have a more differentiated perspective how to prepare foreign students (and themselves) and evaluate unexpected results. We asked the students to assess the following statements on a four-point Likert scale:

1. How would you describe your personal level of motivation?
   - a.) I easily can be encouraged from others or situations.
   - b.) I easily can be discouraged from others or situations.
2. Which of the following aspects do you consider being motivating for you within learning processes? I experience as motivating …
   - a.) if the imparted knowledge is useful/valuable for my (private/workaday) life.
   - b.) if the imparted knowledge contributes to my personality development.
   - c.) if the imparted knowledge improves my chances on the job market.
   - d.) if I deliberately can select the learning content / topic.
   - e.) if the imparted knowledge is strongly needed for upcoming examinations / tests / presentations.
   - f.) if my professor/employer instructs me to acquire this knowledge.
3. If you feel discouraged because of a seemingly unmanageable task, how do you revive your motivation?
   - a.) I take a rest in order to free my mind and continue later on.
   - b.) I force myself to stick to the task in order to solve the problem.
   - c.) I generally finish such tasks unsolved.
   - d.) I look for possible support (persons, literature, and others).
   - e.) I turn to different work first and later on return to the difficult task.
   - f.) If the task is dividable into subtasks, I confine myself on the subtasks that I can manage and ignore those I cannot.
   - g.) If the task is dividable into subtasks, I confine myself on subtasks I am personally interested in and later on get back to the difficult tasks.

After having completed the test studies on understandability and appropriateness, the questionnaire was translated from English to German and Korean. The Korean version of the questionnaire additionally was retranslated to English in order to ensure the correctness of its translation (German is the first language of the authors). We initially chose the both countries Germany and South Korea due to several reasons: Germany and South Korea are considered having a more or less homogenous culture (Ziltener, 2006) and have a single national language (Leonardi, 2002, p.314). The technological infrastructure and common economical situation in both countries is similar. Both countries are considered being culturally very

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different: South Korea is a traditional collectivist Asian country while Germany is a very individualistic western industrial country (Hofstede & Hofstede, 2005, p.43, p.79).

Survey setting

In disbelief of the still frequently adapted theory that culture generally is a national phenomenon (Montesquieu, 1748, p.310), we had to determine the scope of the received data (transferability) and particularly wanted to find out if the investigated items actually were culturally biased. For our research, we adopted the culture definition from Oetting (1993, p.41) who defines culture as '*the customs, beliefs, social structure, and activities of any group of people who share a common identification and who would label themselves as members of that group*'. According to this definition, 'culture' is a society-specific majority criterion. In order to avoid blurring, we defined a vast majority (60 %) as general requirement. In order to determine the society, which was responsible for the cultural biasing, we implemented the study in an in-depth design in the German context: We had and took the chance to send mass e-Mails to invite all students of three German universities (in different regions) to participate in our Learning Culture survey. The response rate of the students was between 2.5-7 %, which is quite typical for online-surveys. We received 1817 (2400 total) fully completed questionnaires from the German students; the distribution of the data within each university allowed us to distinguish between the different study fields (in the following, we use the term 'faculties'). This enabled us to determine which social/organizational context's culture was the actual driver for the students' answers, the faculty, the university, or the nation. In South Korea, we investigated students from 39 universities in and around Seoul (the large area of Seoul covers about 50 % of all inhabitants of South Korea). The questionnaire was distributed in paper form, as, due legal reasons and different to the German context, we did not get access to the e-mail distribution systems of the universities. In order to reach students from a high number of universities (broad design), we conducted the Learning Culture survey in the subway system of Seoul, following a random route algorithm (Kromrey, 2006, p.309-310) for the choice of participants. In South Korea, we received 286 (325 total) fully completed questionnaires (non-response rate ~50 %).

Findings

In the German university context (Ger.), we found a slight diversity in the answers between the faculties within universities, but those rarely were higher than the average answer spectrum (~20 %). However, the general answer patterns were very homogenous between the universities as well as between the faculties. In the South Korean context, we were able to separately analyse the results within nine universities (due to the numbers of response). We found very similar answer patterns at both levels, within each investigated university as well as on the Korean national level. A single Korean university showed significant differences to the others. After further investigation we found that in contrast to all others, it was designed for extra-occupational education. In Germany, we additionally investigated large companies in order to determine if our results could be generalized to all educational sectors and found

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significant differences (Richter & Adelsberger, 2012) to the results in Higher Education (HE). The HE-results of the 'Learning Culture' questionnaire items of the motivation-block are shown in Figure 1.

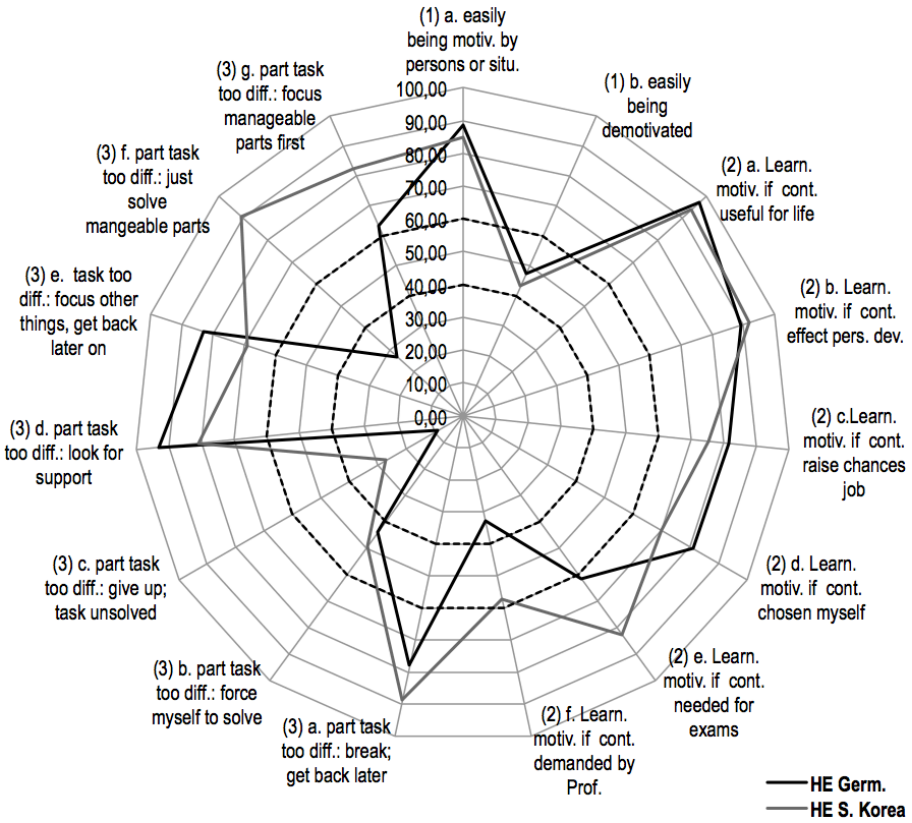

Figure 1. Learning Culture Survey: Motivation of HE students in Germany and South Korea

We binarized the data from our four point Likert scale in order to receive percentage values, which represent positive and negative answers. In the net-diagram (Figure 1), the average percentage values of the students' positive answers regarding each of the items are displayed per country (Germany, black line; South Korea, grey line). Please note that just such points represent defined values where the curves cross each item's axis. We chose the net-diagram for displaying the results because it allows us to identify answer patterns and related differences on sight by distinguishing shapes. As per our definition, cultural biasing is to be considered if at least 60 % of the answers in a context are positive or negative, both, the 40 % and the 60 % level are highlighted in Figure 1.

Regarding some items, we found significant differences between the investigated contexts. However, in contrast to other topics we investigated, such as the students' expectations towards instructor-support (Richter, 2012a) or the students' attitudes towards time management (Richter, 2012b), the patterns between both countries are quite similar regarding our question block on motivation. In each investigated context, an answer spectrum of 20-30 % (extreme values) is common (in Figure 1, the averages are displayed) while clear results (95 %-100 %) have just been found in a small number of the in total 102 investigated items. Where we found strong differences regarding motivation was in the students' strategy how to deal with tasks that appear overburdening: The Korean students seem to limit their solutions

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on the manageable parts (90.88 %) while the German students stick to the whole task (26.78 %). The students in both countries stated that they easily can be encouraged (88.59 % Ger.; 84.97 % SK). The level how far students are able to stick to a too difficult task, forcing themselves to find a proper solution and how quick they feel discouraged by outer influences seem to be individually different (for both between 40 %-60 %). Regarding the purpose of learning particular contents, the students in both national contexts reported that they experience learning as motivating, if the contents are valuable to either their life (96.96 % Ger.; 93.71 % SK) or personal development (89.25 % Ger.; 91.96 % SK) in general. Differences between both contexts were found in the more specific questions: The German students experience it more motivating than the Korean students, if they can choose the contents themselves (81.00 % Ger.; 69.93 % SK). In return, the Korean students seem to understand acquiring particular knowledge as motivating when demanded from the lecturer/professor (57.34 %), which is not the case for the German students (32.81 %). In addition, the Korean students seem to focus their learning efforts on the exams (target orientation) as they experience taught contents as motivating if needed for an exam (80 %). As for the German students, the exam surely plays a role, but just 61.69 % of the German students experience the requirement of an exam as a satisfying reason to learn particular contents. The majority of students reported not to leave a too difficult task completely unfinished (give up). However, leaving a task partly unfinished seems rather to be an acceptable option for the Korean students (27.02 %) than for the German students (8.69 %). Both countries' students proactively look for support if they do not find an appropriate solution (93.26 % Ger.; 81.05 % SK). Regarding the strategy to deal with an unmanageable task, the German students appear rather to distract themselves with completely different things (82.99 % Ger.; 69.12 % SK). In contrast, the Korean students rather focus on the manageable parts of this task (82.49 % SK.; 63.22 % Ger.).

Limitations

Our so far collected culture-related data cannot be generalized to all learning scenarios within a national context. In Germany, we conducted the survey in the contexts of Higher Education as well as vocational training. In contradiction to the general national culture approach of Hofstede and Hofstede (2005) that follows the culture concept of Montesquieu, we found occasional disparities between different company-contexts (company culture seems to affect learning culture) but significant differences when comparing university results with results from companies (Richter & Adelsberger, 2012). We did not yet try to implement our survey on school level; due legal reasons, this revealed extremely difficult within the German context. However, for children below the age of twelve years, there are hints that their natural curiosity has a higher impact on their attitudes than their cultural biasing (Buehler et al., 2012). Although within each investigated context, the results from all investigated universities were similar to each other, generalization on national level is problematic as soon as different languages are spoken (see Leonardi, 2002, p.314). In a small-scale test study, we investigated students in the French and the British language parts of Cameroon and found significant differences (per a priori analysis) between both contexts. Even though the numbers we

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achieved are far from being representative, the result is a hint on what may be expected. In order to approve such phenomena, we need to investigate further countries in which different national languages are spoken or former politically distinguished regions were merged, e.g., in the contexts of colonization.

Future research

Besides the finalized versions in German, English, and Korean, the questionnaire has been translated to Bulgarian, French, Russian, and Turkish but not yet retranslated for verification and improvement. We were able to carry out small-size studies (~35-55) in Bulgaria, Cameroon, Ukraine, and Turkey. Another small size study is currently being organized in Ghana. Those small size studies are good for evaluating the cultural appropriateness of the questionnaire, as well as to gain a first impression on what is to be expected when conducting larger-size studies. For the next steps, we need strong voluntary support from the community regarding translations and retranslations of the questionnaire as well as by providing access to students. As extension of the Learning Culture survey, we developed a metadata-set (~170 attributes) to describe educational contexts (Richter & McPhersen, 2012) and already collected corresponding data in order to ensure the appropriateness of this metadata set. We right now are working on a first implementation of a publicly available database, which includes both, the data from the Learning Culture survey as well as from the contextual investigation. With this database, we aim to foster the stakeholders' understanding of cultural differences in order to reduce unnecessary learning conflicts. We further on think that linking/matching learning resources with their corresponding (national) datasets could strongly support users when searching contents and having to decide about their appropriateness and adaptation needs. We still need to achieve a better understanding particularly regarding multilingual countries (e.g., India), urban environments (more different language versions need to be available), and indigenous societies, which too often are treated as ignorable sub-societies within nations.

Conclusion

The aim of our research is preserving the learners' initial motivation in educational settings by avoiding unnecessary conflicts that could jeopardize the learners' joy of learning. In our thematically comprehensive 'Learning Culture' survey, we investigate the cultural biasing of students' attitudes, behaviours, and expectations towards education. With a better understanding of cultural differences in education, we can raise the stakeholders' awareness towards more tolerance and foster the development of culture-sensitive approaches. In this paper, we focused on our questionnaire's thematic block 'motivation' and analysed how the students evaluated their own motivational predispositions towards outer influences, their purpose of learning and affections towards particular knowledge, and their strategies to deal with educational tasks that appear unmanageable or too difficult for them.

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In our bi-national study we unexpectedly found little significant differences between the answers. From the results, we can derive some general recommendations: The students from both contexts stated that they easily could be motivated. In our questionnaire block on feedback, all students reported experiencing laud as highly motivating; good work results thus should not be taken for granted but explicitly acknowledged (Richter, 2012c). This already might encourage students at all motivational levels; the already motivated, those who need encouragement, as well as those who appear wilful ignorant. As most students stated that they are not easily discouraged, delivering clear information on demands and expectations at the beginning of a course/program could make the difference between acceptance and frustration and help preserving the initial motivation: The Korean system is seemingly more open towards accepting partial results than the German system. Korean students appear to gain motivation when particular knowledge is demanded by instructors and useful for exams. German students, in contrast, prefer understanding the benefits and like to influence the choice of contents.

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AN ANALYSIS OF ASSIGNMENT FOR IMPROVEMENT TEACHERS TRAINING BY DISTANCE EDUCATION IN KOREA

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Introduction

The advance in ICT has been concurrent with more extended distance education, as it serves to offer lots of educational opportunities without being restricted by time and space and to ensure outstanding educational accessibility, cost-cutting effectiveness and autonomous interactivity. The term 'e-learning' is more universally used in related national strategies than the term distance education. In this study, however, the latter is used since it is comprehensive of e-learning. In the case of national documents, the terms included in the originals of national documents were left intact. Distance education was initially provided in the business sector, and that is utilized as one of efficient ways to enlarge the opportunity and place of education in elementary and secondary education. In addition to student education, distance education is also conducted to enhance the competence of teachers to boost the quality of education. Distance education training that caters to teachers is defined as e- learning training courses that are provided for trainees involving teachers, government workers in charge of education and people in general in cyber spaces over the Internet [4]. It is not easy for teachers to take existing offline training courses due to spatial restrictions and time constraints, and the introduction of distance education makes it possible to get rid of such restrictions to offer a wide variety of training opportunities for teachers. Distance education training was introduced in 2000. Afterwards, that has continued to attain a steady growth, and approximately two hundred thousand teachers took training courses at 71 distance education training centres in 2012.

However, a problem has continuously been posed along with the spread of distance education. In spite of the quantitative growth and splendid prospect of distance education, there is still room for improvement in terms of quality, but not many efforts have been made to improve distance education in quality. In terms of distance education training, a plan to build and run a total e-learning quality control system was prepared in May, 2006, to boost the quality control of distance education. And Korea Education & Research Information Service was selected as a distance education training support centre in June, 2009, according to the presidential decree of teacher training in order to enrich distance training and back up the distance education training centres. To ensure the qualitative improvement of distance

education training, quality control by the distance education training centres is important, and it seems that the successful implementation of government policies is crucial as well. It will be of great use for distance training when the government executes consistent policies and offers appropriate assistance.

The purpose of this study was, therefore, to examine the opinions of the administrators of the distance education training centres in an attempt to determine priorities for the revitalization of teacher training.

Method and Result

Every distance education training centre that numbered 69 was investigated to find out their opinions on the operation of the centres or national policies. Three people each were selected from the distance education training centres: CEO, COO and a person in charge of contents. And then an online survey was conducted by e-mail by utilizing the e-mail address lists of the staff of the distance education and training centres. After the centres were asked by e-mail to participate in this survey, they were asked again by phone. The survey was implemented from November 10 to 27, 2011, and 40 people who belonged to 20 training centres or more were surveyed.

Evaluation and importance of government assistance

To what extent they agreed to the given items about national distance education policies and the operation of the distance education training centres was investigated on a five-point scale, and then their scores were recalculated on a scale of one hundred points.

Out of the 12 items, they agreed most to the item was "the personnel in charge of it have a superb professionalism". The second most agreed item was "an internal quality control system is established in relation to the development and management of contents", and the third most agreed item was "each training centre developed and offered specialized contents". The fourth most agreed item was "the government pushed ahead with e-learning policies in a systematic way".

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Table 1: The degree of agreement to the items on national policies and the operation of the distance education training centres Unit: % (the number of case)

Classification	Absolutely disagree	Disagree	So-so	Agree	Quite agree	Mean score
The government pushes ahead with e-learning policies in a systematic way.	2.5(1)	5.0(2)	42.5(17)	47.5(19)	2.5(1)	60.63
A standardized contents development method is provided, and a platform is built.	2.5(1)	20.0(8)	42.5(17)	32.5(13)	2.5(1)	53.13
A joint platform is built among the training centres.	10.0(4)	37.5(15)	37.5(15)	12.5(5)	2.5(1)	40.00
The government offers a lot of assistance for distance education training.	5.0(2)	35.0(14)	35.0(14)	20.0(8)	5.0(2)	46.25
Excellent e-learning contents are well discovered and publicized.	5.0(2)	22.5(9)	55.0(22)	15.0(6)	2.5(1)	46.88
The government officially manages and evaluates distance education training on a regular basis.	10.0(4)	0.0(0)	60.0(24)	27.5(11)	2.5(1)	53.13
Excellent e-learning contents are supplied free of charge or at a low cost.	12.5(5)	25.0(10)	50.0(20)	10.0(4)	2.5(1)	41.25
A council is successfully run to step up mutual interchange and collaboration among the training centres.	27.5(11)	25.0(10)	37.5(15)	7.5(3)	2.5(1)	33.13
Plenty of personnel are in charge of it.	5.0(2)	15.0(6)	57.5(23)	17.5(7)	5.0(2)	50.62
The personnel in charge of it have a superb professionalism.	0.0(0)	0.0(0)	42.5(17)	45.0(18)	12.5(5)	67.50
An internal quality control system is established in relation to the development and management of contents.	0.0(0)	10.0(4)	32.5(13)	50.0(20)	7.5(3)	63.75
Each training centre develops and offers specialized contents.	2.5(1)	10.0(4)	37.5(15)	37.5(15)	12.5(5)	61.88

In contrast, they didn't agree a lot to three items. One was that excellent e-learning contents were provided free of charge or at a low cost, and another was that a joint platform was built among the training centres. The third was that a council was successfully run to step up mutual interchange and collaboration among the training centres. Concerning the percentage of agreement to each item, 45.0 percent and 12.5 percent respectively agreed and quite agreed to the item that personnel in charge had a superb professionalism. 50.0 percent and 7.5 percent respectively agreed and quite agreed to the item that an internal quality control system was established in relation to the development and management of contents. Thus, they agreed a lot to these items. On the contrary, 10.0 percent and 37.5 percent absolutely disagreed and disagreed respectively to the item that a joint platform was built among the training centres, and 27.5 percent and 25.0 percent absolutely disagreed and disagreed respectively to the item that a council was successfully run to step up mutual interchange and collaboration among the training centres. Overall, as many as 52.5 percent disagreed to this item.

Their awareness of the importance of each item was investigated on a five-point scale, and then their scores were recalculated on a scale of one hundred points.

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Table 2: Importance of the items on the operation of the distance education training centres and national policies
Unit: % (the number of case)

Classification	Never important	Not important	So-so	Important	Quite important	Mean score
The government should push ahead with e-learning policies in a systematic way.	0.0(0)	0.0(0)	7.5(3)	65.0(26)	27.5(11)	80.00
A standardized contents development method should be provided, and a platform should be built.	0.0(0)	2.5(1)	22.5(9)	47.5(19)	27.5(11)	75.00
A joint platform should be built among the training centres.	0.0(0)	7.5(3)	30.0(12)	42.5(17)	20.0(8)	68.75
The government should offer a lot of assistance for distance education training.	0.0(0)	0.0(0)	2.5(1)	62.5(25)	35.0(14)	83.12
Excellent e-learning contents should be well discovered and publicized.	0.0(0)	2.5(1)	17.5(7)	52.5(21)	27.5(11)	76.25
The government should officially manage and evaluate distance education training on a regular basis.	0.0(0)	0.0(0)	22.5(9)	62.5(25)	15.0(6)	73.13
Excellent e-learning contents should be supplied free of charge or at a low cost.	0.0(0)	7.5(3)	45.0(18)	37.5(15)	10.0(4)	62.50
A council should be successfully run to step up mutual interchange and collaboration among the training centres.	0.0(0)	2.5(1)	22.5(9)	52.5(21)	22.5(9)	73.75
Plenty of personnel should be in charge of it.	0.0(0)	0.0(0)	15.0(6)	52.5(21)	32.5(13)	79.38
The personnel in charge should have a superb professionalism.	0.0(0)	0.0(0)	2.5(1)	67.5(27)	30.0(12)	81.88
An internal quality control system should be established in relation to the development and management of contents.	0.0(0)	0.0(0)	7.5(3)	52.5(21)	40.0(16)	83.12
Each training centre should develop and offer specialized contents.	0.0(0)	0.0(0)	2.5(1)	70.0(28)	27.5(11)	81.25

They placed the largest importance on the item that the government should offer a lot of assistance for distance education training, and another item that they considered most important was that an internal quality control system should be established in relation to the development and management of contents. They attached the second most importance to the item that the personnel in charge should have a superb professionalism, and the third most important item was that each training centre should develop and offer specialized contents. The fourth most important item was that the government should push ahead with e-learning policies in a systematic way. Specifically, the item that the government should offer a lot of assistance for distance education training was considered important by 62.5 percent and very important by 35.0 percent, and the item that an internal quality control system should be established in relation to the development and management of contents was considered important by 52.5 percent and quite important by 40.0 percent. Thus, as many as 90 percent or more considered the two items important or quite important. The item that the personnel in charge should have a superb professionalism was considered important and quite important by 90 percent or more, and the item that each training centre should develop and offer specialized contents was considered important and quite important by 90 percent or more. Also, the item that the government should push ahead with e-learning policies in a

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systematic way was considered important and quite important by 90 percent or more. The majority placed a great importance on these items.

In contrast, the item that a council should be successfully run to step up mutual interchange and collaboration among the training centres was considered relatively less important, and the item that the government should officially manage and evaluate distance education training on a regular basis was considered relatively less important. The item that a joint platform should be built among the training centres was considered relatively less important as well, and the item that excellent e-learning contents should be provided free of charge or at a low cost was considered relatively less important.

The most important matter and top priority for the revitalization of the training centres

As a result of asking the participants which would be most important for the revitalization of the distance education training centres, and they placed the most importance on the item that the government should offer a lot of assistance for distance education training (40.0%).

Table 3: The most important matter and top priority for the revitalization of the distance education training centres

Classification	**The most important matter**		**Top priority**	
	The number of response	**%**	**The number of response**	**%**
Total	(40)	100	(40)	100
The government should push ahead with e-learning policies in a systematic way.	(3)	7.5	(6)	15.0
A standardized method to develop contents should be provided, and a platform should be built.	(1)	2.5	(3)	7.5
A joint platform should be built among the training centres.	(1)	2.5	(2)	5.0
The government should offer a lot of assistance for distance education training.	(16)	40.0	(9)	22.5
Excellent e-learning contents should be well discovered and publicized.	(3)	7.5	(3)	7.5
The government should officially manage and evaluate distance education training on a regular basis.	(1)	2.5	(1)	2.5
Excellent e-learning contents should be supplied free of charge or at a low cost.	(0)	0.0	(0)	0.0
A council should be successfully run to step up mutual interchange and collaboration among the training centres.	(2)	5.0	(5)	12.5
Plenty of personnel should be in charge of it.	(1)	2.5	(6)	15.0
The personnel in charge of it should have a superb professionalism.	(0)	0.0	(1)	2.5
An internal quality control system should be established in terms of the development and management of contents.	(6)	15.0	(3)	7.5
Each training centre should develop and offer specialized contents.	(6)	15.0	(1)	2.5

The second most important item was that an internal quality control system should be established in relation to the development and management of contents (15.0 %), and another second most important item was that each training centre should develop and offer specialized contents (15.0 %). The third most important item was that the government should

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push ahead with e-learning policies in a systematic way (7.5 %), and another third most important one was that excellent e-learning contents should be well discovered and publicized (7.5 %).

As a result of investigating top priority for the revitalization of the distance education training centres, they gave the first priority to the item that the government should offer a lot of assistance for distance education training (22.5 %). As stated above, that was considered the most important matter as well. The second priority was the item that the government should push ahead with e-learning policies in a systematic way (15.0 %), and another second priority was the item that plenty of personnel should be in charge of it (15.0 %). The third priority was the item that a council should be successfully run to step up mutual interchange and collaboration among the training centres (12.5 %). On the contrary, just one respondent gave top priority to the items that the government should officially manage and evaluate distance education training on a regular basis (2.5 %), that the personnel in charge should have a superb professionalism (2.5 %) and that each training centre should develop and offer specialized contents (2.5 %). Thus, they gave relatively less priority to these items. Finally, nobody placed top priority on the item that excellent e-learning contents should be provided free of charge or at a low cost. It showed that they did not deem this item to be an urgent task to be resolved.

Conclusion and Suggestions

Distance education training could become a means to enhance the competence of teachers to take the quality of education to another level when it gets more prevailing. This study attempted to discuss what improvements should be fulfilled in government policies in order to expedite the revitalization of distance education training.

As a result of asking the participants to what extent they agreed to relevant government policies of backing up distance education training, the participants gave less than a mean of 50 marks to most of the government policy items. It indicated that the distance education training centres did not put a high value on the assistance from the government. In terms of importance, they placed the most importance on the item that the government should offer a lot of assistance for distance education and training, and attached the second most importance to the item that an internal quality control system should be established in relation to the development and management of contents. When they were asked to give their opinions on the most important matters and top priority for the revitalization of the distance education training centres, the item that the government should offer a lot of assistance for distance education and training was most widely mentioned. Overall, it is found that the government did not offer full-fledged support for distance education training in general.

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Given the findings of the study, there are some suggestions on how to accelerate the revitalization of distance education training:

1. The Ministry of Education, Science & Technology should prepare and execute a master plan for distance education training to provide financial and administrative aid for the distance education training centres that are under the umbrella of Korea Education & Research Information Service.
2. It is required to offer more assistance for the best distance education training centres instead of merely managing the centres in a negative way such as applying disciplinary actions just based on the results of quality control.
3. The government should team up with the distance education training centres when it formulates and executes policies to expedite the spread of distance training. In addition, it is necessary to keep track of the needs of trainees to provide them with every possible convenience. A good example will be to offer training courses by making use of smart devices.

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ENERGIZING THE CLASSROOM: RECONCEPTUALISING LEARNING SPACES FOR HIGHER EDUCATION IN THE 21ST CENTURY

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Introduction

City University London has developed new learning spaces that avoid the 19th century style lecture theatres commonly used in Higher Education Institutions today, and has been exploring and developing flexible innovative learning spaces that aim to support emerging pedagogies and enhance the joy of learning. This paper focuses on the evaluation of one of these flexible learning spaces, designed to enable collaboration and innovation within the classroom. With the addition of tablet technologies, flexible furniture and a wireless infrastructure that can support students' own devices these rooms can move seamlessly between a traditional classroom and a computer lab, in a space designed for collaboration and group work. The evaluation evidences that the blend of mobile devices with flexible learning spaces can enhance the student experience, and provides an opportunity for academics to explore new pedagogies.

Literature Review

Current thinking around the kinds of learning spaces that universities should be providing for students and staff are inspired by dramatic reconceptualisations of teaching and learning, and equally dramatic developments in information technology and mobile computing. Educational theories such as constructivism and experiential learning are prompting more and more academic staff to rethink their traditional lecture-and-seminar approach to teaching, and adopt more student-centred methods. Increasingly, staff see their role as teachers less in terms of information transfer and more in terms of guiding students through their own learning, and giving them the support they need to make their own discoveries (Biggs, 2003; Ramsden, 2003). In turn, this means a shift away from content-oriented curricula, which are based on a body of knowledge which the teacher transmits during a course, to outcomes-based models, which prioritise instead what learners need to do and learn in order to achieve certain outcomes (Beetham, 2007).

Developments in IT and increased ownership of mobile computing devices by students and staff are both a cause and enabler of these changes (Bass, 2012). The Mobile Devices Survey at City University London found that in 2010, over 99 % of students owned a mobile device that could connect to the Internet (Lindsay et al., 2010). Pervasive technology is becoming a reality in the higher education sector, as universities react to students' expectations (Economist Intelligence Unit, 2008): students have instant access to information at all times, challenging the notion of the lecturer as the single authority on the subject at hand. Yet, web 2.0 tools and constant connection to the Internet also mean that students and staff can cut across time and space barriers and work together at anytime, anywhere. They must learn new skills in evaluating and applying information, not just collecting or remembering it (Siemens, 2004; Milne, 2007).

The spaces an institution builds signal the value that it places on academic work and study (Banning & Canard, 1985; Chism & Bickford, 2002). Yet, the spaces themselves also have a powerful and direct effect on the types of work, study and interaction that can take place there. Traditionally designed lecture theatres and seminar rooms reflect traditional classroom dynamics: a single, authoritative instructor and rows of passive students (Milne, 2006; Montgomery, 2008; Graetz, 2006). Spaces provided for private study tend to prohibit talking, eating and drinking, or socialising – yet many people prefer to study in more relaxed environments (Acker & Miller, 2005; Strategic Initiatives, 1998). Students vote with their feet in this respect, and often choose to study in the canteen or café (Grummon, 2009). The majority of spaces available for formal and informal learning in universities were designed and built according to a waning paradigm.

Such spaces were also built to maximise efficiency, cost effectiveness and utilisation. The design, construction and management of classrooms, lecture theatres and other rooms on university campuses have traditionally been the responsibility of estates and facilities departments. Increasingly, however, it is recognised that the process involves many stakeholders – among them, students and academics, technical staff and architects, as well as facilities management. As primary users of university space, students' views are particularly important. The needs of each group are different. Modern learning spaces must meet pedagogical and technical drivers, as well as offering good value for money in terms of space utilisation (Hunter, 2006).

There is a growing consensus among higher education institutions that formal and informal learning spaces need to be updated and redesigned to incorporate a greater variety of teaching and learning methods, allow for more flexibility and reconfiguration, and meet staff and students' expectations for IT and mobile connectivity (JISC, 2006; Space Management Group, 2006; Scottish Funding Council, 2006). Many leading universities are changing the way they design and build their learning spaces, according to the new paradigms of constant connectivity, collaboration, and active learning. In the UK, there are major estates renovation projects underway at, for example, UCL and Sheffield, and innovative case studies and pilots at the LSE, Warwick and Edinburgh, to name but a few.

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UCL are implementing an estates renovation plan which aims to maximise "the potential ... for inter-disciplinary discussion and debate" in its common rooms and to "[provide] strategies for adaptability to accommodate future change in teaching and working trends" in its teaching and learning spaces (Lifschutz Davidson Sandilands, 2011, p.12 and p.16). At Sheffield, the Estates strategy states that "changes in pedagogy [and] a trend towards smaller group learning, has put significant pressure on small to medium sized seminar rooms and spaces" and the university is investigating ways to "increase flexibility of current spaces" and "split group lecturing to smaller groups" (University of Sheffield, 2011, p.27). Smaller case studies and pilots include those at the LSE, where disused space has been converted into "an environment for collaborative and explorative learning": interconnecting rooms equipped with reconfigurable furniture, high-spec IT facilities, audio zoning and magnetic work walls (JISC, 2006). Warwick's new learning spaces have been informed by the ideas of active and social learning, and their new facilities are designed around the principles of flexibility and future-proofing in terms of technological provision (Monk, 2010). At Edinburgh the SLiDA case study has aimed to "redesign teaching and learning spaces in response to students' needs", and the library renovation project "aims to provide the working spaces required for contemporary methods of teaching, learning and research" (Hardy, 2010).

Further afield, there are many examples of innovative and successful learning space renovation projects, especially in Australia and the USA, at institutions such as the MIT, Stanford and ... MIT's learning spaces project is guided by the principles of community, interaction, flexibility and ubiquity: the idea that learning can take place anywhere. As a result, it has redesigned and renovated many of its buildings to allow for collaborative learning methods and "hands-on experimentation" (MIT, 2012). At the Institute of Design at Stanford, circular tables with stool-height seating and easy access to technology encourage movement around the space. Staff believe this leads to more collaborative working among students, and allows more active teaching methods and "students who generate rather than receive information" (360 Steelcase, 2010, p.13).

There are many further examples of learning spaces projects in higher education institutions around the world. The factor common too many of them is the belief that pedagogy is as important a driver as space efficiency or cost effectiveness. While such flexible spaces may seem more expensive to maintain and less space-efficient than the alternatives, the Institute of Education's report to the Space Management Group writes that "'inefficient' use of space in a narrow sense may lead to larger efficiencies in the institution's total outputs" (Space Management Group, 2006, p.10). In designing learning spaces, higher education institutions are beginning to realise their objective of creating spaces which facilitate and encourage ubiquitous learning and connectedness, through processes of stakeholder involvement, experimentation and evaluation, and holistic design.

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The iPad Cart Project

As part of the wider Learning Spaces project, the School of Arts and Social Sciences combined an iPad Cart with flexible classrooms that contain movable chairs and tables (including node chairs), magnetic squiggle glass on multiple walls, and a projector, visualiser and PC at the front of the room. The project was created in order to meet the following aims and objectives:

- To provide a flexible classroom, that can move seamlessly from a traditional classroom to a space suitable for collaboration and group work with online or computer based activities.
- To remove pressure from Timetabling who have difficulty providing enough computer labs to meet needs across the institution.
- To provide classrooms that enable academics to experiment with a range of pedagogies not previously available due to the fixed nature of the computer labs on campus.
- To help further the centrally run Learning Spaces Project, which this year has focused on building classrooms suitable for collaboration, to enable these spaces to be used as computer labs suitable for group work.
- To experiment with "the classroom of the future", creating a new model for classroom teaching at City University London that will enable us to stay ahead of our competitors in terms of flexible, innovative, effective and learner-centred teaching.
- To ensure ALL students have access to tablet technology ensuring those that cannot afford their own devices have access to emerging technologies, and are given the opportunity to gain the same digital literacy skills as their peers.

The iPad cart allows the Education Support Team in Arts and Social Sciences to centrally manage and image 30 iPads which can be booked out by academic staff. The cart is available for staff that would like to teach in a flexible classroom space, but would also like their students to do some work with either internet access (for example journal searching, sharing of resources, collaborative exercises, quizzes in the VLE or access to VLE materials during class), or alternatively to run activities that utilize software that is available for the iPad (for example recording and editing audio or video).

Methodology and Results

Semi-structured interviews were conducted with eight of the academic staff that used the iPads to understand whether they met the needs of staff and students, to explore how the iPads were used to support teaching and learning, and to gauge the level of support needed.

A variety of activities were undertaken using the iPads. They were most commonly used for web browsing, accessing course materials via Moodle, and in class research. Examples from some of the departments are detailed below.

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Music

During class students were directed to the course Moodle site. The lecturer uploaded the texts and graphic musical example for that day's lesson in advance. While students were doing their in-class exercises, this allowed them to use the iPads to skip backwards and forwards through the lesson text to help them do the exercise. They could also look on the internet for relevant musical examples to help them as well.

Law

The iPads were used in conjunction with one of the flexible learning spaces, in order to teach a course around journal searching and research methods. The iPads were used to enable students to search online whilst working in small groups. The sessions take the form of a workshop: the lecturer would talk through journal searching and research skills in small chunks, the students would then have a go on the iPads, at first working through activities together, before having a go on their own. After each activity the students would give feedback on the different ways they had found the information required. The activities included finding cases, legislation and journals online and looking at websites to establish trustworthiness of the source.

Journalism

The iPads were used for small group seminars (groups of 12 or 13 students) in a participative, interactive class for practical journalism. The students looked at examples of journalism on news websites. The lecturer uploaded links to all the articles he would like the students to look at on a Google doc, with some background information to each. The link to the Google doc was circulated to all of the students. The students were then issued the iPads in pairs, read the articles and then used the web browser to search for examples of their own. They then added the links to these to the Google doc so that they could all view each other's work. Students then used the iPad to write a brief piece based on the information provided in the Google doc, before being given access to a model answer, circulated via the Google doc at the end of the class.

Cultural Policy and Management (CPM)

Students on this course arrange a main event at the Camden Roundhouse a concert venue in London. In order to arrange this event they need to do research into local bands. This year the students were issued with iPads in order to work in small groups to look at band websites. Students then used Poll Anywhere on the iPads to add their favourite bands to a list and then vote for them anonymously as a class.

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Psychology

The iPads were used during an induction/orientation activity for the new BSc Psychology first years. The students were split into groups of 5 or 6 according to their personal tutor. They used the iPads to shoot a short video about themselves and their personal tutor. They used iMovie to shoot and then edit the videos, and were given Vimeo accounts to upload their videos to. To do this they had to find out some information about each other, and use the internet to find some information about their tutor, and then film themselves introducing each other. They were given freedom to do this in any way they chose. They completed this activity on the first day of induction week, and the videos were ready for them, and their tutors to watch at the end of the week.

Interview Results

Were these activities a new addition to the class, or a re-imagining of previous activities?

Most of the activities conducted with the iPads had been run before and were simply re-imagined, the iPads allowing for more flexibility. There was a 50/50 split between activities that had previously been conducted on paper, and those that had been conducted in a traditional computer lab.

Those that had previously been conducted on paper were enhanced by access to the internet, Moodle or software and online tools such as Poll Everywhere for voting or Google docs. In journalism they allowed for copywriting exercises to be done electronically rather than on paper. The iPads were found to save time as academics no longer needed to spend time photocopying hand outs; they could simply upload materials to Moodle and then allow students to access them via the iPads in class.

> *"Students can type out their work instead of handwriting which makes support easier, leaning over the students it's easier to help them re-write their copy." (Journalism)*

> *"before it was much harder to get students organized into working together, and it was hard to get them to feed back. This way of working meant students could get up and go and show each other things". (Law)*

Those that had previously conducted the class in a traditional computer lab found much more flexibility in terms of group work and discussion.

> *"The physical environment of a rowed computer lab isn't very suitable. It affects the feel of the class, whereas with this you can have everyone sitting around a table together … It helps replicate the feel of a professional working environment." (Journalism)*

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> *"PCs in rows tend to erect barriers between teacher and student (not helped by the size of many monitor screens). The teacher can't see what the student is doing and the students' level of engagement tends to be quite low… Whereas an iPad is smaller than an A4 handout, and can be set down easily if needed." (Music)*

Did any of the students use their own devices?

In every class, many students (the staff interviewed guessed at around 50 %) opted to use their own devices for activities in the classroom, and they seemed happy to do this. However, the iPads meant that no student would be excluded from any activities, and the lecturers could rely on devices that had the right software and would be suitable for the activities they intended to run.

Were there any technical difficulties, and how disruptive were they?

There were few minor technical difficulties reported, mainly around the browser occasionally crashing, or the WiFi connection dropping out momentarily, however these were not felt to disrupt the class. The iPads were, however, found to have limitations compared with laptops or regular PC's. The most disruptive of these was the inability to deal with Flash content. This impacted on CPM students who were tasked with researching music band websites, unfortunately many of these websites are built in Flash and are not iPad enabled. These are not compatible with the iPad and in one extreme case the lecturer had to abandon the iPads and return to a computer lab. The iPads also rely on a good Wi-Fi connection; there were no reported problems, but it is a dependency that may lead to problems at some point down the line.

Was training required for staff and students?

No training was required by either staff or students. The iPads were felt to be intuitive, although in many of the interviews staff expressed an interest in sharing best practice and learning how other members of staff are using the iPads in order to understand how they might utilise them more effectively in the future.

Do academic staff intent to use the iPads again in the future?

All of the staff interviewed said that the iPads met their needs and the needs of their students. They would like to continue to use the iPads to support their teaching in the future. CPM will not continue to use them for web research due to the flash issue, but will continue to use the iPads for other in-class activities.

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Conclusion

The evaluation showed that given the right environment, staff are ready and able to adapt their teaching to develop more active learning methods with students. The different cases of use show that the iPads are being used in a large variety of ways in conjunction with flexible learning spaces, and this has created opportunities that had not previously been available. Access to the iPads meant that students had more choice around which device or operating system they prefer to use to suit their needs, while ensuring the classroom was equipped with technology that had the right capabilities, battery life and software to provide a reliable classroom setting for academics. The flexibility of furniture and the devices themselves led to a space suitable for collaboration and active learning, while still maintaining some of the benefits of a traditional computer laboratory.

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INSTITUTION'S ROLE IN SUSTAINABILITY OF THE E-LEARNING APPLICATION

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Executive Summary

The e-learning is seen as an efficient tool in the reform of higher education and modernisation of the universities to the needs of the 21st century. In order to implement ICT and e-learning technologies, universities need to create a vision of the desired end state and develop an e-learning strategy with proposed measures in that direction. Traditional, research oriented universities, like the University of Zagreb, have to find the way to implement new technologies in traditional values of the university education and ensure the success of the set goals in the implementation process.

The aim of this paper is to describe institution's role in the e-learning application and analyse situation of the e-learning implementation at the University of Zagreb. Implementation process was monitored through surveys which provided data on starting position and views on e-learning and present status on e-learning application five years later. Based on received results, the university management is able to get a general picture on the implementation process, detect weak points and set the next steps in the systematic implementation process.

Reasons for the strategic approach to e-learning

Sustainable implementation of new technologies (technologies and methods of e-learning) is a process that requires significant changes in the education system or in higher education institution. Such changes are a part of the broader changing process usually related with the improvement of the quality of the education system or educational outcomes, or with inevitable adaptation of the educational system or institutions to the today's needs of society, employers and students.

The success of implementation of new technologies undoubtedly depends on teachers' enthusiasm and their readiness for the breakthroughs in the educational process but also their enthusiasm and readiness for the innovativeness represents the driving force for changes in the education process.

The purpose of the change should be initiated from both "the bottom up" and "top down" with the bottom having the knowledge and the top having the power. The top should use its power, but not openly and directly, in order to facilitate the work from the bottom and to provide conditions under which it can progress.

The responsibility lies on the management to rethink and to plan changes, to actively and efficiently govern them and to ensure their transparency on the institutional or system level. When talking about e-learning, institutional leadership is necessary to ensure that opportunities, which ICT brings, are adequately connected with strategic goals of the system or institution, especially with the existing educational strategy and principles and that ICT can be adequately implemented for concrete needs of the educational process in defined conditions. Strategic approach in the e-learning application implies that e-learning values have been recognized and supported on the institutional level, that the application and development of the e-learning and adequate resources are planned and regularly and promptly secured. For these reasons it is important that decision on changes is reached on the highest management level.

Study Case – The University of Zagreb

The University of Zagreb is traditional and research oriented university with 340 years of tradition in the field of higher education. It is the largest Croatian university with more than 60,000 students and 33 schools covering all fields of the human knowledge. Besides welcomed diversity, this brings along additional challenges in achieving the integration and speed in realisation of necessary changes at the University.

The reform of higher education linked to the Bologna process has brought new demands to education itself, as well as to the overall university management. The use of ICT and e-learning technologies was seen as a significant change driver in education as well as an opportunity to modernize and answer to the social pressure towards wider access to higher education and lifelong learning. Therefore, adaptation of new technologies into existing organisation and education was one of the steps taken by the University of Zagreb.

At the University of Zagreb, some e-learning technologies had been available and used from nineties by some teachers, however these initiatives didn't result in systematic and sustainable use of e-learning. International project EQIBELT – Education Quality Improvement by E-learning Technology which started in 2005 and lasted for three years hastened the decision to start with systematic implementation of e-learning. The project produced strategic and operational documents on e-learning and e-learning support centre and helped in raising awareness on e-learning and its possibilities in the improvement of the educational process. The "top down" approach started in 2007 with the E-learning Strategy which was adopted at the University Senate. The Strategy was developed with the aim to provide a positive, stimulating environment and to foster implementation of e-learning The Strategy did not impose any model of education as it was foreseen that any obligatory and uniformed model would fail at a large and diversified traditional university like this.

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Also, the Strategy brought a definition of e-learning as there are various definitions and different interpretations and it is important that when talking about e-learning at the University of Zagreb everyone have a clear idea and understanding of what it is.

E-learning application

The University of Zagreb started with the systematic implementation of e-learning in 2007. The E-learning Strategy was the beginning of the implementation process and it indicated the institutional leadership in the implementation of ICT and e-learning technologies in the process of the modernisation of education and an enhancement of the education quality improvement. Along with it, it was envisaged that one of the first steps is to ensure constant, sustainable and quality support to teachers and students. The E-learning Centre at the University Computing Centre was established as the focal point for the systematic take-up and support of e-learning across the university. Also, its role was to monitor the e-learning implementation and realisation of activities defined by the E-learning Strategy.

Following the E-learning Strategy stipulations, the University Committee for E-learning and the University Office for E-learning were established as advisory and administrative bodies in the application of e-learning.

The E-learning Centre established and maintains the university e-learning platform and e-learning technologies. The Centre also provides support and training to users (teachers, students, and schools), works on promotion and dissemination of e-learning in the academic community and e-learning networking at the university, as well as internationally level. Training and support can significantly encourage teachers to try something new, as they don't have time to search and look for technologies, money to purchase them or knowledge to decide which one will be the best for their needs. They have to focus on their subject and technology should be available and easy to use with support which can be reached quickly and in different ways. The E-learning Centre tries to ensure all levels of support the users might need from discussions, consultations and tutoring, support in using the technology, to development of learning materials and courses. The Centre also encourages the setting of the local support teams at schools and cooperates with them. It is also important to recognize teacher's time and efforts involved in the developing and running e-courses. The University has established the E-learning Award which is granted on the annual basis for the best e-learning courses. The E-learning Day is the opportunity to share and show experience and ideas and to see the best practices of the e-learning implementation in the educational process.

Analysis of the achievement

For the monitoring of the e-learning application and implementation of the E-learning Strategy, annual surveys have been conducted since 2007. Surveys provided information on the existing conditions of e-learning at the University of Zagreb and also school's management plans and attitudes towards e-learning and its implementation in the university education. Surveys have been performed on the annual basis and are filled in by the official

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representatives for e-learning at all 33 schools of the University of Zagreb. In that sense surveys provide mainly visions and attitudes of the school managements on the situation and perspective of ICT usage and forms of learning developments in the educational process at the University of Zagreb. Survey in 2007 was a starting point providing the ability to perceive the present condition. Further surveys gave the possibility to monitor the implementation process, have pointed to potential weaknesses and have served as a ground for further plans. All conducted surveys had the same questions divided in three areas: estimation of present level of ICT and e-learning use in the education process, expectations on e-learning and plans for the future involvement on e-learning.

Surveys confirmed the continually present and from the beginning declared university and school management attitude that e-learning can and should essentially contribute to the education quality improvement at the University. It demonstrated positive students' stance towards e-learning, growth of teachers' awareness and acceptance to the new technologies, growth of the e-learning platform availability and in generally progress of the settings and conditions for e-learning implementation at the University of Zagreb schools.

Comparisons of the results regarding the present condition, expectations and plans involving e-learning at the University of Zagreb showed high diversity between 33 schools as expected.

The survey results for 2011, pointed out that 61 % of schools found e-learning important and vitally important for the quality of the educational process (79 % in 2007; 76 % in 2008; 70 % in 2009; 64 % in 2010). 36 % finds e-learning important but not significantly and 3% finds that e-learning is not important. In general, it can be concluded that there is a positive atmosphere towards e-learning. If we take a look over the results during five years it can be seen that at the beginning of the implementation process the attitude towards e-learning was more positive and that it has been slightly deteriorating over the years.

This degradation can be explained in several ways. At the beginning of the implementation process, the University Computing Centre has led an international project on e-learning (EQIBELT) which brought quite the attention to e-learning. The project finished at the beginning of 2009 and university then had to rely more on own financial resources and find the way to ensure the sustainability of the achieved project results. Another issue is that school managements have re-election every two years and there is a possibility that newly elected management were not adequately or enough acquainted with the benefits of e-learning implementation, the E-learning Strategy and achieved results. On the other hand there is evidentially some disappointment with the results of the e-learning implementation, especially at those schools which expected to make achievement "overnight". Another reason can be that the school managements' support on e-learning implementation was a declarative and that at the moment when it was necessary to allocate concrete resources and efforts in sustainability and systematic implementation of e-learning, such support was denied. Also, reasons can be looked for at the University level. The University of Zagreb highlights the education quality improvement as one of the highest priorities, but it seems that the need to enhance the e-learning implementation process is more declarative than real and concrete and will not reach

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set goals. In such a situation, school managements don't see the need to enforce the E-learning Strategy and the e-learning implementation.

The survey results showed that the number of schools which see the benefit of ICT in the education quality improvement has slightly decreased with regards to the first survey. This percentage is still high and 70 % of the school managements find that the present situation for the e-learning implementation at their schools is positive or even exceptionally positive. The survey results pointed out that 82 % of the University of Zagreb students have a positive and exceptionally positive attitude towards e-learning while such an attitude holds only 49 % of teachers. The data shows that there is an urgent need for teachers and schools to improve the existing teaching methods and to stimulate students towards an active participation in the learning process with the aid of the e-learning technologies. Again, managements' attitude on systematic implementation of the new e-learning technologies has important role. They certainly have influence on the teachers' attitude, and if teachers who don't use new technologies in their teaching are in management of the school, there is a great chance that they will not support or start such projects and changes. The role of the vice dean for teaching should be emphasised as they can significantly contribute to the education quality improvement, but can also linger or depreciate teachers' efforts related to the education quality improvement with new technologies. Unfortunately, in cases when schools' management insufficiently support the use of innovative technologies in teaching, teachers are left to themselves and to their enthusiasm, which can lead to cases where teachers give up because their effort and work is not evaluated and even to the situations where they are pressured to turn back to the old ways of teaching. Some institutions, although they have already quite a number of teachers who use e-learning technologies in teaching, just don't take in consideration this fact and don't find it important to reflect on it and start with systematic implementation of e-learning. At schools where there is strong management support and commitment towards the use of new technologies and improvement of the education, the e-learning implementation process usually goes smoothly and teachers fell less reluctant towards new methods and technologies.

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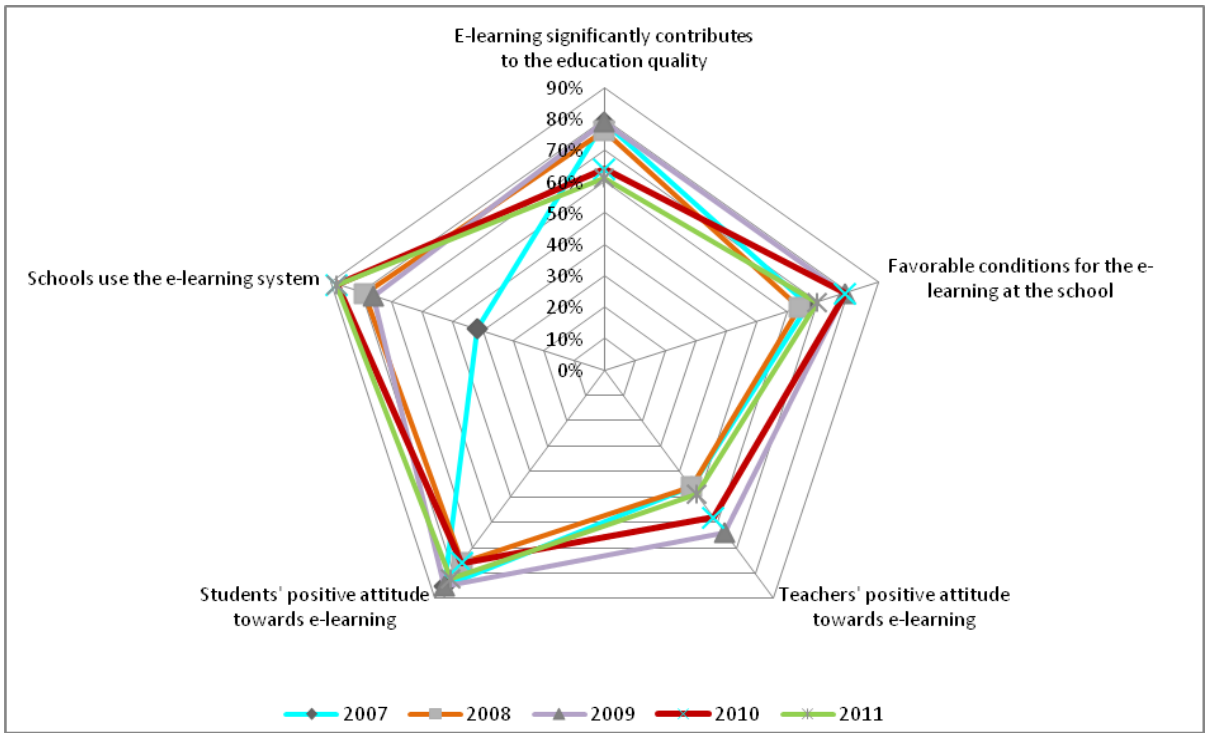

Figure 1. University of Zagreb school's reply on the basic questions related to the situation estimation on e-learning (percentage of the schools who has positively answered the questions)

Based on the survey results and information gathered through the E-learning Centre and the University Office for E-learning, schools at the University of Zagreb can be divided into three groups:

1. schools which have been using e-learning for years and which are in their education programme predisposed to develop and use e-learning; to them the E-learning Strategy is confirmation that they are on a good way and incentive to continue their work;
2. the largest group consists of schools where e-learning hasn't been present or it was present through individual efforts of some teachers, but in the last 3-4 years they have made significant breakthroughs towards systematic e-learning implementation; Two subgroups are recognized in this group. In first subgroup are schools at which e-learning is strategically planned and positioned, the management really supports the e-learning implementation and there is a continuing progress. Second subgroup consists of schools which has made initial breakthrough but have then stopped or slowed the implementation process, often because of the lack of school management support or not clearly enough defined goals and preconditions for e-learning implementation;
3. the last group consists of a very small number of schools which have been rather passive and inert regarding the e-learning implementation and which didn't recognize the possibilities of e-learning and have done nothing regarding the systematic e-learning implementation.

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Although the part of the responsibility is on the school management, university has responsibility as well. It has been recognized that there is a need for clearer, stronger and more transparent stance at the university level towards the e-learning implementation from establishment of the mechanisms for planning, allocation and realisation of the resource for the e-learning implementation, more decisive encouragement for use of joint resources to maybe the most important issue – defined the University strategic goals in the field of education.

Conclusions

According to the survey results there are good preconditions for the successful implementation of the e-learning at the University of Zagreb and according to the data received from all schools, the majority is on a good path on implementation of ICT and e-learning in the educational process. In generally it can be said that the systematic e-learning implementation, started with the E-learning Strategy, resulted in raised awareness on the e-learning possibilities and benefits and led to the systematic, planned and positive attitude towards e-learning application. Sustainable and qualitative central university resources for the e-learning have been established and are available to all schools and teaching staff across the university. The Strategy was ambitious and it was expected that it won't be able to realize it fully in set deadline because of the several objective circumstances (financial, organisational and timely). As the Strategy contained mechanisms which have ensured the continuous monitoring and measurement of achieved results and goals, it is easier to facilitate realisation of the activities and to reflect of further steps.

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EXPERIENCES ON BLENDED LEARNING AS AN APPROACH IN HIGHER EDUCATION

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Introduction

This paper focuses on experiences of Blended Learning when it is applied as part of an approach to build capacities for e-learning in higher education. Specifically, it builds on the efforts of several academic subjects as they struggle with the implementation of a model-project aimed at generating generic forms for applying Blended Learning within the university. The lessons learned and discussed in this paper include difficulties in finding the right blend of online and face-to-face activities, and the difficulties in accommodating different student groups and teaching practices in the rather loosely defined concept of Blended Learning. What seems to be working best is to practice a light version of Blended Learning rather than one where the blend is to be described to be all-in. A common theme is the need for a leadership and commitment in both versions.

Blended learning is a concept that combines traditional face-to-face teaching with online learning. The concept blended learning has evolved over the years (Graham, 2006). According to Singh & Reed (2001), blended learning could be in different forms and what is actually blended may vary. As a basic form of blended learning offline denotes conventional class room teaching and online denotes teaching through internet or intranet. Blending may also denote the use of both self-paced and collaborative learning strategies, for instance self-paced reviewing of important literature combined with peer-to-peer discussions. Blending may also denote the way learning is structured and imply structured as well as unstructured learning. Blending may also denote the use of content in different forms, generic content and customized content used deliberately to enhance the learner experience. In blended learning the focus is on the learning objectives of the course or program and not on method by which it is delivered. Blended learning provides an opportunity to optimize the learning outcome and the cost of course or program delivery (Singh & Reed, 2002) since blended learning helps to reach a wider audience compared to class-room settings. Blended learning thereby implies taking advantage of face-to-face as well as on-line teaching methods.

Though the concept to blended learning is easy to grasp, it offers considerable complexity in its implementation (Garrison & Kanuka, 2004). It is important to integrate the face-to-face and online technology appropriately (Garrison & Kanuka, 2004), if the "blend" is not appropriate the final learning output may not be satisfactory. Designing of effective blended

learning requires a fundamental reconceptulaization and reorganization of the teaching and begins with considering specific contextual needs and contingencies (Garrison & Kanuka, 2004). Learning is a social process (Brown & Duguid, 2000) and many believe that e-learning does not provide the social aspects of learning which class-room training may provide (Wenger & Ferguson, 2006). As such it is difficult to estimate the quality in a Blended Learning approach, and also difficult to understand and separate how students experience the relations between face-to-face teaching and online teaching (Ginns & Ellis, 2007). Research on Blended Learning has also largely been in the form of case studies, and more studies are needed to focus on the relationship between the different forms of learning, face-to-face and online (Bliuc, Goodyear & Ellis, 2007). The case study reported on in this paper focus on experiences of Blended Learning where the relation between the different forms and the blend is highlighted.

A good quality higher education needs to provide the students both theoretical and real practice in a given field (Mary, 2009). Field visits offer different advantages to the students which include opportunity to connect theoretical knowledge with the real world situations and instigate further interest in their chosen field (Elleven et al. 2006), create awareness about career prospects (Beale, 2000), could facilitate the students to appreciate about the real world challenges and need for cooperation and team work (Beale, 2000), provide opportunity to interact with experts (Stoddard, 2009). In a Blended Learning setting, all these requirements may be blended into the educational mix.

Specific background – e-learning as a University strategy

In 2011, Mid Sweden University formulated an overall university strategy within five areas concerning education. One of the top two prioritized areas were e-learning, and the university formulated the vision for 2015 to be recognized as successful in e-learning, both among students and staff, in comparison with other universities in Sweden (and in the world). E-learning should be considered an approach for education both off and on campus.

This implies that Mid Sweden University was to be active and leading in the development of forms of e-learning for higher education. A policy and action plan for e-learning was formulated intended to build on the quality criteria for e-learning of The Swedish Higher Education Agency (HEA, 2008). The action plan should highlight the resource needed for e-learning in the form of teacher time, and requirements for technical and educational support.

In this approach it was included that different academic subjects and departments may start projects of a model character, in which different approaches to education that might be placed under the umbrella term e-learning was to be tested, evaluated, and in the end implemented on a whole university scale. Model projects include for instance approaches such as mobile learning, and in this case Blended Learning.

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Blended learning as a model-project

From one of the departments at Mid Sweden University, an ambition was to develop different aspects of blended learning in their teaching and learning. The overall objectives of the project that was initiated in 2011 was to develop a consistent approach for the development of courses and programs that are structured according to the principle of blended learning. This implied an understanding of blended learning described as a format for coordinating distance and campus learning with e-learning as a link between the campus and distance learning. Included was an objective to develop quality aspects of blended learning from a process perspective. The project should describe what is required in every stage to enable the development and implementation of blended learning. A framework for planning, developing, and implementing blended learning courses were to be developed, and several courses and programs were to be adapted into Blended Learning forms. When the project started, five academic subjects were included. After the first year, four remained and continued the project to the end.

Methods

Theoretically, this paper builds on a case-study design (Stake, 1995). This implies coming to understand the particularity and complexity within one single case, and for this purpose building on data gathered in different ways. Empirically, this paper builds on several parts. From each of the four academic subjects, written experiences has been gathered concerning their participation in the project, the extent to which the staff has been involved, the extent to which the project has affected courses and programs and students. Included have been their views on what have been the strengths and weaknesses of the approach, as well as their view on the process and implementation of the project and course evaluations.

The written material has then been complemented with follow-up interviews with representatives from each academic subject, in total seven interviews. Included in the interviews were questions concerning priorities that had been made during the project, areas in which the approach had been successful or not, as well as aspects of the implementation that had brought insights that might surprise the participants. The interviews lasted approximately 30 minutes each.

Approach to analysis

All data gathered from the project was analyzed using a SWOT analysis approach (Pickton & Wright, 1998). The SWOT approach was chosen based on its possibilities to generate a valuable output and its possibilities to include aspects of the process. Even though it can be seen as a low-grade form of analysis, it provides in its simple form an overview of the perceived pros and cons of the case. It also points towards some possible actions or consequences that need to be considered. But as Pickton & Wright point out, it has limitations and it might be subject to over-subjectification and bias. In this paper, the strengths of the

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analysis lies in its easy to grasp overview, and its limitations have been carefully considered in the analysis of all three writers when documenting the case.

Analysis

In this analysis, data are first categorized and then interpreted to be seen as strengths, weaknesses, opportunities, or threats. Gathered under each category are summarized statements of aspects arising in each category. The distinctions that are interpreted to be decisive for each aspect are clarified as far as possible, providing some context from the case, but formulated as general as possible. Behind each aspect lie different forms of data.

Strengths

- Attracts more students, and allows students with different backgrounds to study. In the project one distinct feature of moving into Blended Learning was the issue of attracting a more solid base of student for programs.
- Allows for a more flexible way of allocating resources. By integrating two previous modes of delivery for the same program, resources could be more flexibly used in the delivery of the education.
- Provides students with better possibilities to succeed with their studies by offering more flexible conditions. In the project, students on campus benefited from having access to content, materials and teaching that was simultaneously provided for online students.
- Gives a richer environment to all students, regardless of face-to-face or online teaching.
- Requires a good and sound pedagogical idea, which is anchored within the entire staff. This provides an education with a well thought through quality assurance.
- Adds to both previous models, campus and online, with common practices and materials. Sometimes it is enough to provide materials of rather low-tech character, if it is accessible in a flexible way.
- Another strength of the approach is to connect individual students to a larger collective of students, making it possible for them to relate to and learn with and from others by social interactions difficult to achieve in solely online education.

Weaknesses

- Relies heavily on the technologies chosen for course delivery, whether those are asynchronous or synchronous. If the technology and the support are missing, teaching often fails to meet the expectations of the students of flexibility. Timing is both more flexible and more rigid.
- Diverts the attention for the teacher if students participate simultaneously in the classroom and online, e.g. through a videoconference. Teachers are in need of new teaching skills to cope in a new environment or setting.

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- Provides a dilemma for the course management in giving priority to different groups of students. If focus is on the student that follow a blended learning course at campus, those not present might get neglected. If focus is on those following the course through online teaching, those present at campus might feel neglected. A good mix is difficult to achieve.
- Relies on a well thought trough leadership at the department level giving the right conditions for teachers to develop new practices and not just mixing existing.

Opportunities

- New practices are developed that previous groups, campus and online, both benefit from.
- Students have the possibility to choose more flexible when and what to attend, and study more on their own premises.
- Entire staff of teachers gets involved in the teaching and develop both the mode of delivery as well as the pedagogy behind their teaching.
- Students learn more and better when they are provided with more flexible forms of studying.
- A lean or light version of Blended Learning is in some cases enough, and students and staff have good opportunities to develop the approach from a more modest point of departure. For instance by beginning with recorder lessons provided asynchronously to all student.
- Opportunities are also given to provide more field experience, connecting theoretical aspects of the education to more practical applications. Students at field trips and doing field studies are possible to connect to each other and to the teacher through the use of videoconferencing systems available in hand-held devices.

Threats

- Infrastructure in terms of technology and support needed for the delivery is weak or missing.
- Teachers' pedagogy is not adequate for a Blended Learning approach, nor are the teachers technological skills needed for coping with the new environment.
- A too heavy approach is aimed for in terms of integration between face-to-face and online practices, and teachers as well as students are disappointed when expectations on flexibility are not met.
- Students' expectations are not in accordance with the pedagogical model chosen.
- Leadership at the department view the approach primarily as a way to save money and integration of campus and online students are done without taking either of the groups into account.
- Enough resources for planning and delivering education are not provided, and teachers end up with working conditions in which workload increases out of control.

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Discussion

From the analysis, there are some aspects of Blended Learning that stand out as important experiences in which new lessons are learnt and new understandings of Blended Learning could be formulated. For instance, the strengths and opportunities lie to a large degree in the development of new pedagogical practices and not just new ways of using technology. Allowing for students to include social dimensions in their learning provided both at campus and online (Brown & Duguid, 2000), as well as connecting students from different kinds of field experiences makes it possible to bridge issues of theory and practice in new ways (c.f. Beale, 2000; Elleven et al, 2006; Stoddard, 2009). This is also the main feature of the weaknesses and threats to the approach, an issue that calls for a leadership not only at the level of a department (or university) but on a collegial level. In some cases, the basic pedagogy needed for a successful delivery builds on old insights. Providing the right kind of material with the right kind of complexity and technological standard is not easy, and often the effective practice builds on the idea that less is more. Leadership on the department (or even university level) is important to provide the right conditions, technological standards and support, which benefits the teachers to develop their practices to fit their different subject needs. Finding the right blend, as Garrison and Kanuka (2004) would call it. If so, the practice of Blended Learning that can be developed can fit the academic subjects, and at the same time accommodate the students with rich opportunities to be successful in their studies, providing the right relation between face-to-face and online teaching (Ginns & Ellis, 2007).

Conclusions

It is evident that the issue of blending, or finding the right blend, is important. The possibilities that Blended Learning has rely heavily on finding the right mix of ambitions as well as characteristics for each academic discipline, course, program, even teacher. In a light form, Blended Learning can be seen to be very easily adapted and successful. Providing student with contents that is pre-made or providing student with content that is accessible asynchronously is not difficult and highly appreciated. Blended Learning Light is in this sense the highway for success.

On the other hand, providing Blended Learning that permeates the pedagogical soul of the subject, course, program or even teacher promises far more exciting possibilities for educational change. But this is, as can be easily understood, far more difficult. It relies on not only the individual teacher, but on the entire university, all the services, support, technical conditions, and not least the positive engagement of all teachers involved in the process. It calls for a fundamental engagement and commitment to change, and relies in a leadership at the university starting from the highest level of management, down to the level where teachers and student meet, face-to-face or online.

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MONITORING ICT INTEGRATION – HOW TO INCLUDE EARLY CHILDHOOD EDUCATION

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Abstract

Simultaneously with technology investments, a call for monitoring instruments arose to gain insight into the return on investment. In Flanders, a monitoring instrument, called MICTIVO, is used to obtain information about the status of ICT integration in Flemish education. During the first edition of MICTIVO (2007-2008), actors from early childhood education indicated that a lot of questions used in the monitor were not applicable to the early childhood education context. Therefore, a new scale was developed to measure ICT use in this educational context. Exploratory factor analysis was carried out in a previous study. Confirmatory factor analysis was used on partial data from the second edition of MICTIVO. Results indicate that two types of ICT use can be distinguished: 'ICT use supporting basic skills and attitudes' and 'ICT use supporting contents and individual learning needs'. The constructed scales are valid and reliable measurement scales with good goodness of fit estimates and good levels of internal consistency. These two instruments are helpful in further research on ICT integration in early childhood education. Moreover, data confirms that the grade in which a teacher works is an important factor related to the amount of ICT use in early childhood education.

Introduction

Nowadays, ICT has found its way into the classrooms. Policy makers worldwide have invested a lot of money to introduce and integrate ICT in education, and this has happened for educational, economic as well as social reasons (Selwyn & Brown, 2000). In 2007, an ICT curriculum for compulsory education was launched by the Flemish government. This compulsory ICT curriculum is written in terms of ICT attainment targets and only applies to primary (age 6 to 12) and secondary education (age 12 to 18) (Vandenbroucke, 2007). This means that preschools (age 2.5 to 6) are not obliged to use or integrate ICT in their curriculum. The Ministry of Education considers it the responsibility of preschools themselves to choose the moment to start working with ICT with their children. Simultaneously with the implementation of these ICT attainment targets, a call for a monitoring instrument arose as

government, researchers and practitioners wanted to gain insight into the return on investment and effects of ICT on teaching and learning.

The current study reports on the use of a monitoring instrument in Flanders, the Dutch-speaking part of Belgium, called MICTIVO (Monitoring ICT Integration in Flemish Education). During the first edition (2007-2008), the monitor was conceived and validated (Evers et al., 2009). ICT integration was measured through four different aspects: ICT infrastructure and ICT policy, ICT use, ICT competences, and ICT perceptions of students, teachers and school leaders. Actors from different educational levels participated in the first study. To guarantee maximum comparability, the aim of MICTIVO was to develop an instrument that can be used for all these educational levels. In Flanders, a distinction can be made between early childhood education, primary education and secondary education. Only primary and secondary education are part of the Flemish compulsory educational system. Attending early childhood education is not an obligation, but a large majority of preschoolers (93 %, Werkgroep kleuterscholen Vlaanderen, n.d.) go to school from the age of 2.5. The choice for comparability implicated a less strong focus upon unique characteristics of every educational level. This means that ICT use and competences in early childhood education were questioned in the same way as in primary education, through ICT attainment targets that only apply to compulsory education. This resulted in a sense of irrelevance amongst school leaders and teachers in early childhood education. They experienced a lot of the questions used in the MICTIVO-monitor to be not applicable to or appropriate for preschools. In other words, to get a clearer picture of ICT use in early childhood education in Flanders, it seems not sufficient to use the same attainment targets as a basis to measure ICT use in this educational context. One example: the item 'Students can use ICT to search, process and save information' is clearly a less appropriate target for children who do not know yet how to read and write. Evers et al. (2009) conclude that if we want to integrate early childhood education in the MICTIVO-monitoring instrument, it is necessary to develop a separate instrument that pays attention to the specificity of this educational context and the possibilities of ICT within this context. During the current school year, the monitor is administered a second time. Taking into account the experiences of the previous administration of MICTIVO, the question arises how to include early childhood education in the monitoring instrument in a way that it helps to obtain valid data and information from this educational level.

ICT in Early Childhood Education

ICT can be defined as *'anything which allows us to get information, to communicate with each other, or to have an effect on the environment using electronic or digital equipment*' (Siraj-Blatchford & Siraj-Blatchford, 2003, p.4). ICT includes much more than just computers, it also includes digital cameras, creativity and communication software and tools, the internet, telephones, interactive stories, computer games, programmable toys, electronic whiteboards, etc. (Bolstad, 2004).

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Plowman and Stephen (2005, 2006) indicate that there are cultural differences between learning in the preschool sector and learning in primary schools. The curriculum is less prescriptive (e.g. in Flanders early childhood education works with 'development goals' instead of attainment targets), and there are different norms of professional practice. There is more emphasis on learning through play and less reference to formal and adult-directed teaching. In this way, integrating ICT into early childhood education can mean something completely different from integrating ICT into primary or secondary education. While in primary education, a distinction can be made between the use of ICT as an information tool, as a learning tool and for learning basic computer skills (Tondeur, van Braak & Valcke, 2007; Vanderlinde & van Braak, 2010), it is not clear how ICT use in early childhood education can be typified. This means that pre-service primary teachers in Flanders can be prepared to help children reach the attainment targets, while there is no such framework for preschool teachers. Different authors point to different possibilities of ICT for young children (e.g. Bolstad, 2004; Kalas, 2010), such as the use of ICT in socio-dramatic role-play, to support language development and mathematical thinking, to support children with special learning needs or from culturally diverse backgrounds, to stimulate social interaction, and to motivate children. This illustrates that ICT offers multiple possibilities and can be embedded in early childhood in many divergent ways. Further, Kerckaert et al. (2013) indicate that the grade in which a preschool teacher works is strongly related to the amount of ICT use in the classroom. This can be connected to the concept of 'developmental appropriateness' (Siraj-Blatchford & Siraj-Blatchford, 2000; Bolstad, 2004; Kalas, 2010). According to this concept, a teacher has to judge what experiences with ICT are appropriate for a certain age and a certain child. To put differently, teachers in the study of Kerckaert et al. (2013) consider the introduction of ICT to be less appropriate for the youngest children. It is interesting to explore whether these findings are consistent with results of the second administration of MICTIVO (MICTIVO 2).

In this contribution, we will first further develop an instrument to obtain valid data and information considering ICT use in early childhood education. Second, we will explore data from MICTIVO 2 to examine whether previous findings regarding the importance of grade can be confirmed.

Methodology

Data Analysis

In a separate study, we aimed to develop a new scale to measure ICT use in early childhood education (Kerckaert et al., 2013). Results of the exploratory factor analysis can be found in Kerckaert et al. (2013). Currently this new scale is being used in the second administration of MICTIVO. We will use partial data from this project to conduct confirmatory factor analysis through AMOS 21.0 and examine the stability of the exploratory factor structure. For the CFA several fit indices are calculated to provide information about the goodness of fit: a non-significant Chi Square, with χ^2/df smaller than 5, RMSEA ranging between .05 and .08, and

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GFI, AGFI, and CFI above .90 indicate a fair fit (Byrne, 2001). The influence of the grade in which a teacher works, will be investigated through ANOVA's in SPSS 20.0.

Participants

305 preschool teachers of 87 schools filled out the survey, as participants of the second edition of MICTIVO. 96.7 % of the sample is female. They have an average of 16.6 years of experience in education, ranging from 0 to 39 years (SD = 9.43). Of the participants, 97 % are teachers in regular early childhood education. 3 % are teachers in special needs education. Of the teachers in regular education, 24.1 % teach in a first grade (age 3 to 4), 23.1 % in a second grade (age 4 to 5), and 23.1 % in a third grade (age 5 to 6). The other participants teach in a class for children aged two-and-a-half to three years (13.8 %) or have a class consisting of children of different ages (15 %).

Results

Scale Construction

As mentioned, in a separate study, a new scale was developed to explore ICT use in early childhood education (Kerckaert et al., 2013). Participants were asked to judge how often they use a certain kind of ICT on a Likert-scale with values 0 (never), 1 (every trimester), 2 (monthly), 3 (weekly), 4 (daily). A solution consisting of two factors was obtained: '*ICT use supporting basic ICT skills and attitudes*' (n items = 5) and '*ICT use supporting contents and individual learning needs'* (n items = 6). All items of these scales are presented in Appendix A.

In the second edition of MICTIVO, these scales are used to obtain valid data about ICT use in early childhood education. However, in order to make the rating scale fit within the context of the monitor, instead of asking for frequencies of use, the labels are changed to completely disagree (0), disagree (1), more or less disagree (2), more or less agree (3), agree (4), completely agree (5). The CFA confirms the two-factor structure (see Figure 1) with all items loading significantly on the two latent factors. All coefficients are between .48 and .91. The results show a good fit between the hypothesized model and the observed data (df = 40, χ^2 = 110.35, χ^2/df = 2.76). The fit indices are GFI = .94, AGFI = .89, CFI = .97, RMSEA = .08, indicating a good fit.

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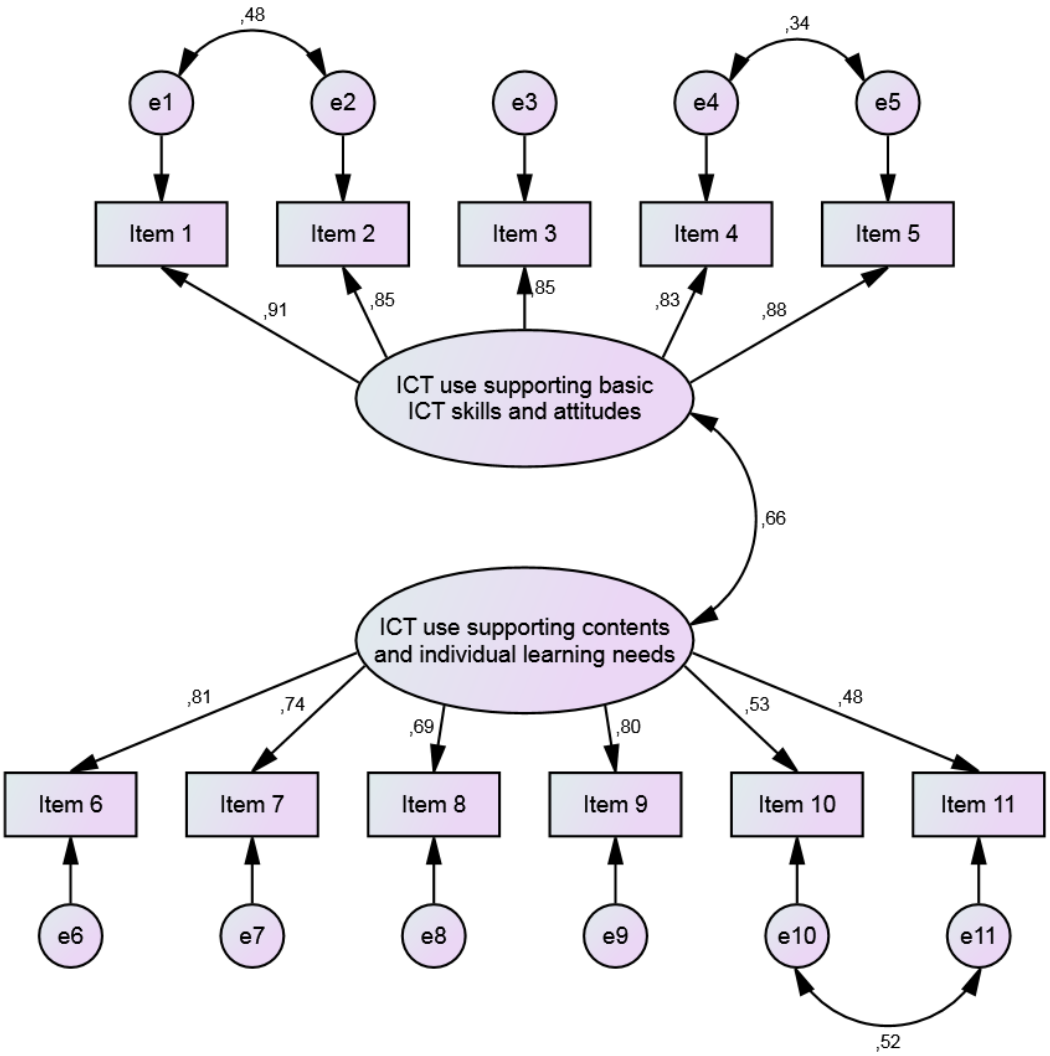

Figure 1. Confirmatory factor analysis for 'ICT use in early childhood education'

In total, three pairs of residuals (e) are allowed to correlate: e1 and e2, and e4 and e5 for '*ICT use supporting basic ICT skills and attitudes*', and e10 and e11 for '*ICT use supporting contents and individual learning needs*'. This leads to a significant decrease in χ^2 (from 280.85 to 110.35) compared to the model without correlated residuals. The correlated residuals suggest a substantial overlap between the items. Item 4 and Item 5 (see Appendix A) can both be related to a responsible and positive attitude towards ICT. Item 10 and Item 11 both focus on supporting individual learning needs of preschoolers. Item 1 and Item 2 seem to relate to teaching ICT basic skills. This could mean that preschool teachers mainly use games to teach their pupils to work with ICT. Finally, the Cronbach's alphas are calculated to examine internal consistency of the two factors. The alphas indicate that both scales are reliable (Table 1).

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Table 1: Cronbach's alphas and descriptive statistics

Scale	Alpha	M	SD
ICT use supporting basic ICT skills and attitudes	.94	70.24	24.77
ICT use supporting contents and individual learning needs	.84	57.34	22.23

First Comparisons

In Table 1, some descriptive statistics are presented. All items were summarized into sum scores ranging from a minimum score of 0 to a maximum score of 100. The average score for '*ICT use supporting basic ICT skills and attitudes*' is 70.24 (SD = 24.77). Regarding '*ICT use supporting contents and individual learning needs*', the average score is lower (M = 57.34, SD = 22.23). Preschool teachers indicate they put a stronger focus on the basic ICT skills of their pupils then on using ICT to support contents or learning needs.

In Table 2, the mean scores for both types of ICT use of teachers of different grades can be found. ANOVA shows that, for both types of use, significant differences exist between grades (basic ICT skills and attitudes: $F(3, 245) = 16.84$, $p < .001$; contents and individual learning needs: $F(3, 245) = 14.97$, $p < .001$). Post-hoc analyses show that the differences mainly occur between third grade and the younger grades (*basic ICT skills and attitudes*, grade 0: $t(248) = -6.50$, $p < .001$; grade 1: $t(248) = -4.16$, $p < .001$; grade 2: $t(248) = -1.28$, $p = .20$; *contents and individual learning needs*, grade 0: $t(248) = -4.82$, $p < .001$; grade 1: $t(248) = -6.06$, $p < .001$; grade 2: $t(248) = -2.31$, $p = .02$). It is clear that the amount of ICT use is related to the age of the children. Teachers who work in classes with multiple ages are not included in this analysis ($n = 56$).

Table 2: Mean scores for both forms of ICT use in different grades

	ICT use supporting basic ICT skills and attitudes		ICT use supporting contents and individual learning needs		N
	M	SD	M	SD	
Grade 0 (age 2.5 to 3)	51.33	27.11	48.49	19.47	42
Grade 1 (age 3 to 4)	64.28	28.08	46.81	22.30	71
Grade 2 (age 4 to 5)	75.35	16.80	59.71	19.06	68
Grade 3 (age 5 to 6)	80.35	18.33	67.79	20.25	68
Total	69.51	24.83	56.35	22.08	249

Conclusion and discussion

In a previous study, we aimed to develop a valid scale to measure ICT use in early childhood education (Kerckaert et al., 2013). During the second edition of MICTIVO, a slightly adapted version of this scale is used to offer a solution for the problems that occurred during the first edition. The constructed scales are valid and reliable measurement scales with good goodness of fit estimates and good internal consistency. The developed scales can be used in further

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quantitative research on ICT integration in preschools. They can also be used to help teachers identify which forms of ICT use are not present in their teaching, but could be interesting to work with. Currently, teachers agree that they rather use ICT to support basic ICT skills and attitudes. ICT use supporting contents and individual learning needs occurs less, but could be considered more innovative. Previous research has indeed shown that ICT professionalization is a crucial factor in stimulating ICT use that transcends supporting basic skills and attitudes (Kerckaert et al., 2013). Also more attention should be given to more qualitative research to be able to give more examples with every type of ICT use.

It is important to notice that item 10 and 11 have the lowest loadings on '*ICT use supporting contents and individual learning needs*'. These items focus on ICT use supporting individual learning needs. It is possible that there should be three factors: ICT use supporting 1) basic ICT skills and attitudes, 2) contents and 3) individual learning needs. This means that future research could try to expand the number of items focusing on individual learning needs. This way, a fully separate factor could be developed to assess ICT use regarding this aspect.

Finally, analysis of the MICTIVO 2 data indicates that the grade in which a teacher works is an important factor related to the amount of ICT use in early childhood education. This confirms the results of a previous study (Kerckaert et al., 2013), and stresses the importance of 'developmental appropriateness' (Siraj-Blatchford & Siraj-Blatchford, 2000).

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Appendix A

Scale 'ICT use supporting basic ICT skills and attitudes'

- Item 1: In my class I teach my pupils ICT basic skills.
- Item 2: In my class preschoolers use ICT to play games.
- Item 3: I teach preschoolers to use the computer and corresponding peripherals.
- Item 4: I teach preschoolers a positive attitude towards ICT.
- Item 5: I teach my pupils to handle ICT in a safe and responsible way.

Scale 'ICT use supporting contents and individual learning needs'

- Item 6: I use ICT with preschoolers to illustrate certain subjects.
- Item 7: I use ICT during instruction.
- Item 8: My pupils discover ICT because I offer them digital stories.
- Item 9: In my class I use educational websites to deliver certain contents to my pupils.
- Item 10: I use ICT for remediating tasks for the preschoolers.
- Item 11: In my class preschoolers with learning difficulties use adapted software/websites.

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The Joy of Learning
Enhancing Learning Experience - Improving Learning Quality
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BIG FOOT – INTERGENERATIONAL LEARNING FOR SOCIAL COHESION, REGIONAL DEVELOPMENT AND … PLEASURE

Thomas Fischer, MENON Network EEIG, Belgium, Barbara di Pietro, Gouré Srl., Italy, Vanina Stoyanova, Centre For Development Of North-West Bulgaria Foundation, Bulgaria, Glykeria Thymiakou, Christina Strapatsa, Trikala Development Agency – KENAKAP S.A., Greece

The Grounding

> *"A hilariously uplifting adventure where the sky is no longer the limit. Carl Fredricksen is ready for his last chance at high-flying excitement. Tying thousands of balloons to his house, Carl escapes to the lost world of his childhood dreams. Russell, an overeager 8-year-old Wilderness Explorer who has never ventured beyond his backyard joins him for the ride! The world's most unlikely duo reach new heights and meet fantastic friends. Stuck together in the wilds of the jungle, Carl realizes that sometimes life's biggest adventures aren't the ones you set out looking for."*

This is the plot of the adventurous Walt Disney movie UP and at the same time a perfect synopsis what motivates and drives the European R&D project Big Foot – Crossing Generations. Crossing Mountains[1] (http://www.bigfoot-project.eu): an adventurous path among the elderly and younger generations, towards the joy of learning, 'playing' and experiencing together.

People of all ages are beginning to realize that the future will be different. For the first time in the history of the World, the 65+ population will be nearly equal to that of younger generations. As the Nobel Prize winning economist Robert Fogel says it best: *"Stay active physically and intellectually and surround yourself with younger people"*, Big Foot shows how that intergenerational learning is beneficial for all generations where the older adults are potential economic resources rather than problems for the national governments.

The social and economic marginalisation faced by a vulnerable group such as elderly citizens, especially living in remote mountain areas, and the young people's migration to the urban centres due to the lack of job opportunities, is causing segmentations among the young and the elderly, is fracturing the connection between the generations and is preventing the exchange of learning opportunities across age groups and generations. This affects also the level of participation of the elderly in the economic and social-cultural development of their

communities In the light of an increasingly ageing population these developments will have also have a substantial impact on Lifelong Learning, which should regard the older generation as an asset and resource base for local learning and development.

> *"Intergenerational practice aims to bring people together in purposeful, mutually beneficial activities, which promotes greater understanding and respect between generations and may contribute to building more cohesive communities. Intergenerational learning is a process, through which individuals acquire skills and knowledge, but also attitudes and values, from daily experience, from all available resources and from all influences in their own 'life worlds'." (EAGLE Consortium & Centre for Intergenerational Practice, Beth Johnson Foundation, 2007)*

Big Foot aims therefore at overcoming the marginalisation of vulnerable groups and at bridging the gaps among the generations living in mountainous areas by establishing 'Intergenerational Community Service Learning' approaches helping i) to maintain physically and mentally active lives of older people, ii) to make them feel they are actually useful to society and not a burden; ii) which in turn gives them a drive to contribute to community development, while improving at the same time the wellbeing of younger generations. It is also a tool focused on community integration and social dialogue, enabling and valorising the skills and knowledge of the older generation, combining traditional knowledge with modern communication tools and expertise in order to enable innovative, creative and productive joint solutions for local sustainable development.

The Intergenerational Community Service Learning is based on an in-depth Participatory Mapping in the three pilot testing areas of the project, using a bottom-up approach allowing the entire local community and local players to express their point of views and to help defining the development course in line with their views, expectations and plans. In the consultation process all interested citizens had the chance to express their perspectives and their needs. It also provided a detailed overview of those activities young and elderly people are interested in and identified learning interventions based on local know-how (i.e. handicraft, small scale agriculture, folkloric activities, cooking etc), which may boost the local development in the long term. The Intergenerational Community Service Learning has been applied in the mountainous regions of Gubbio (Italy), Berkovitsa (Bulgaria) and Trikala (Greece), promoting the older generation as guardians and messengers of traditional knowledge and specific local culture to the younger generations. The Intergenerational Community Service Learning is a combination of the experiential learning and community services in those mountain areas, focused on the community needs and integrating them with the seniors experience and based on the dialogue and solidarity among the generations.

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The Generations

> *"Solidarity between generations at all levels – in families, communities and nations – is fundamental for the achievement of a society for all ages" (United Nations, Madrid International Plan of Action on Ageing, 2002)*

Major economic, social, cultural, political and demographic changes have disrupted and redefined traditional family and social structures and intergenerational relationships in the last decades. The combined effects of a rapid increase in the ageing population and a decline in birth rates are producing fundamental changes in many societies and the demographic change is an undeniable reality affecting Europe. The European Commission in its Third Demography Report in April 2011 revealed that the percentage of the EU population aged 65+ increased from 13.7 % in 1990 to 17.4 % in 2010. Predictions are that, by 2060, about 30 % of the EU population will be aged 65+. The rise of the 'oldest old' – those aged 80+ – is particularly significant. The percentage of the EU population aged 80+ is forecast to increase fourfold from 1990 to 2060. The effects of demographic ageing will be felt all across Europe.

Moreover, today's society is defined by age segregation, in which adults and children have minimal contact and activities together. On a daily basis children and young people experience very few settings that are truly intergenerational; and this is also true for the older adults in today's society. The architecture and the design of communities and neighbourhoods tend to isolate individuals and families, and virtually every program and institution is organised to meet age specific needs at the expense of the richness of intergenerational practices. While intergenerational communities and extended families have long been the norm in the societies of the past, the present society is pulling the generations apart. Among the many factors contributing to this separation are:

- Demographic change, longevity, ageing society and workforce;
- Changing economic, insurance and welfare patterns;
- Increasing economic disparities, '2/3 societies';
- Shift from full- to part-time employment; economic need for mobility and flexibility, 'modern nomads';
- Shift from a industrial to a Knowledge Society;
- Individualised/atomised societies, flexible lifestyles and changing biographies, from individuals to 'multividuals';
- Dissolving traditional family structures, single households, social isolation of the elderly etc;
- Urbanisation;
- Globalisation, migration & ethnic diversity.

Big Foot strongly believes that a successful ageing society is one that prospers, includes the skills and talents of everyone including those who often fall behind, and relies on a blueprint based on intergenerational learning. Involvement with children and education certainly keeps the older adults active but also gives them a sense of pride and achievement that they are

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helping the future. Moreover, improving the wellbeing of older generations is really just the other side of the same coin of improving the wellbeing of younger generations as they have a reciprocal relationship and a common ground. The older generations have been vital to the educational and care of children for time immemorial in the past, their vast stock of experiential knowledge and the time they are so often willing are a huge asset not only to the children who benefit directly, but also society generally.

Therefore, Big Foot recommends that at this stage policy adjustments are needed to reflect better those new realities, with particular attention given to developing new economic and social opportunities, strengthening patterns of reciprocity and exchange, and maintaining productive support structures and mutually beneficial relations between all generations

This is also the reason why Big Foot works towards models of good practices applied and tested in mountainous areas in Europe and afterwards to be transferred to and adapted by other European regions, that support possibilities for multigenerational contributions to society and strengthens the integration and interdependence for intergenerational integration, solidarity and the joy of learning, thus also fulfilling the objectives set within the 2012 European Year of Active Ageing and Solidarity between Generations.

The Learning

The concepts of intergenerational learning, social capital and inclusion are strongly interrelated as both make reference to i) actual and potential resources of social networks for the individual, ii) formally and informally shared norms and values between members of social networks, iii) reciprocity and trust within these networks and between the individual and the network. As a consequence intergenerational learning was over centuries and still is nowadays a prime resource base for individuals, groups and the society at large. Individuals able to access and rely upon these resources and relationships increase their chances for personal and professional development; communities benefit from enlarged mutual exchange, active participation and cooperation; and societies become more cohesive and inclusive. On the other hand social capital is not equally available to all citizens as geographic, individual, social and intergenerational isolation might limit the access to resources. Furthermore social capital is not created equally, but mediated through psycho-social, socio-demographic and socio-economic variables.

> *"Intergenerational learning is a process, through which individuals acquire skills and knowledge, but also attitudes and values, from daily experience, from all available resources and from all influences in their own 'life worlds'." (EAGLE Consortium & Centre for Intergenerational Practice, Beth Johnson Foundation, 2007)*

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In line with the definition the ADD LIFE project (Adding Quality to Life through Inter-Generational Learning via Universities) states that "inter-generational learning recognises relationships between young and old as mutually important to both age groups and to society in general. Inter-generational learning can be defined as the reciprocal learning relationships and interactions between young and old." As a consequence intergenerational learning is composed of the following building blocks:

- Related to interdependence and reciprocity;
- Important for pursuing common activities and growing together – in other words, a relationship is more than a mere interaction;
- Explicitly addressed to the different experiences of the different age groups or generations;
- Oriented towards the exchange of experience so that use is made of the skills specific to each generation;
- Designed to foster critical thinking about how stereotypes tend to weaken the ability to perceive that there are individual differences between people and that;
- Generalisations are never completely accurate;
- Aimed at counteracting a negative stereotype of ageing and takes into account the level of competence of the elderly and its relevance in the education of younger people. Inter-generational learning has the task of developing understanding of the attitudes of other age groups and correcting these as required.

On the other hand it is also agreed that intergenerational learning does not merely consists of generations being together – being together is not enough, on the contrary purposeful activities are the crucial denominating factor. Furthermore not every learning process which involves both young and old can be necessarily regarded to be a case of intergenerational learning, on the other hand 80 % of all learning is estimated informal or un-intentional.

Finally intergenerational learning is not only involving the transfer of knowledge, but at the same time the exchange of attitudes and values from both generations.

According to Boström (2003) a possible map of intergenerational learning within a life-wide and life-long learning context may therefore look as follows:

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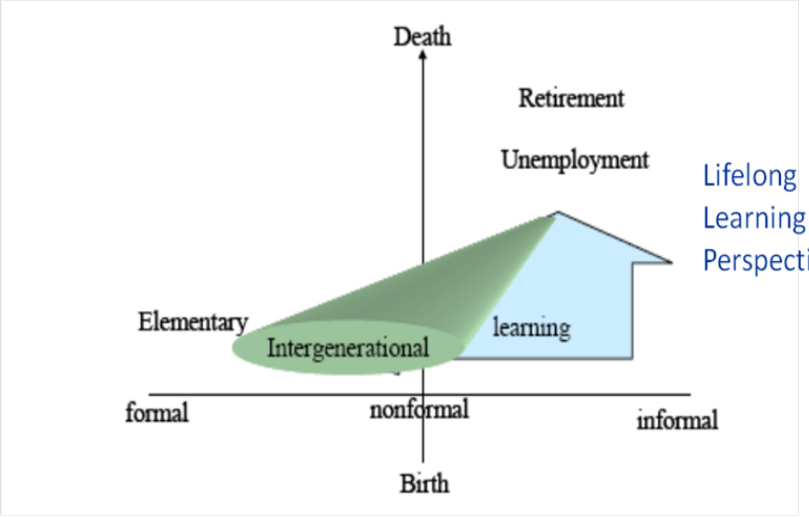

Figure 1. A Possible Map of Intergenerational Learning

The project MATES (Mainstreaming Intergenerational Solidarity) finally describes a set of eight core principles that practitioners and policy makers should take into account when adopting intergenerational approaches:

- Mutual and Reciprocal Benefits;
- Participatory;
- Asset Based;
- Well Planned;
- Culturally Grounded;
- Strengthens community bonds and promotes active citizenship;
- Challenges Ageism;
- Cross-disciplinary.

The pitfalls and challenges of intergenerational work are equally well known from the in-depth analysis of case studies and initiatives. Barriers towards exchange and learning between different generations are commonly denoted as follows:

- The assumption of Homogeneous Groups ('intra' i.e. within one age group and 'inter' i.e. between age groups);
- The role of different Life Worlds, Identities and Value sets and systems;
- The trap of Mono-directional Life Courses;
- The experience with different Pedagogies(e.g. traditional transmissive vs. facilitated collaborative);
- The influence of Technologies (e.g. digital skills and competences);
- The trap of 'one-size-fits-all' solutions (i.e. intergenerational learning is always embedded in a wider societal context);
- The differences in Information Processing (i.e. in terms of depth and width, in assimilation and accommodation as well as in the equilibrium);
- The trap of 'inter-personal', 'inter-/intra-group' and 'inter-generational' problems;

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- The walls of Sectoral Silos;
- The Sustainability of projects and initiatives (either bottom-up or top-down);
- The role of Champions on the ground and Advocates on the top;
- The trap of Standardised Methodologies and Linear Transferability;
- The trade-off between Intergenerational Exchange and Child Welfare/Protection Acts;
- The trade-off between the Public Sector and Third/Voluntary Sector;
- The contradiction between Preservation and Transformation;
- The tension between Romancing the Past' and Promoting Innovation.

The Experiments

Gubbio, Italy

In Italy intergenerational learning has been involving citizens from the Municipality of Gubbio, a town located in the region of Umbria in central Italy. Based on the Participatory Mapping the local cooking tradition was acknowledged to be the most appropriate tool able to transmit the traditions linked to the cultural heritage of the area, and to promote important themes as the preservation of natural resources, the critical consumption and the importance of buying 'local' needed for the entire community sustainable development.

First the Council of Youngsters (with its members of Primary and Secondary Schools) is participating on Intergenerational Cooking Courses led by the members of the Elderly Center in Gubbio. The older adults are the 'trainers' of the youngsters, which not only provide tips and skills how to become a great master chef but also equip them with information linked to their cultural Identity and traditions. In exchange, the young master chefs teach the older adults how to use ICTs and other Social Networking Sites.

Figure 2. Intergenerational Cooking Course in Italy

Second eight classes of Secondary and Primary Schools in Gubbio have been involved in the intergenerational courses 'Food and Thoughts' and 'Culture and Intangible Heritage in Today's Life'. The students, supported by the school teachers, have received once a month a special lecture held by the special key testimonials. The older adults had the chance to tell the

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students their own life story behind each traditional recipe, fostering a reflection in the students on the past traditions and the importance of safeguard them and in today's society, for the development of a better community.

Moreover Big Foot was presented at 31st Truffle Event in Gubbio: the most famous event in Italy which celebrates the precious white truffle and the cooking traditions and the naturalistic beauty of the area. The youngsters coming from all Italy got the chance to cook the traditional recipes as such as the Gnocchi, Tagliatelle, Crescia, learning from the elderly and enjoying playing with them.

Thanks to Big Foot the Municipality of Gubbio decided to involve for the first time the grandparents and grandmothers as master chefs during such an important event, thus demonstrating a change of attitude in the decision making process and its understanding and its will to invest in Intergenerational Learning Services and to overcome stereotypes. The positive impact of the Italian experiment is also encapsulated in the feedback of the participants to the Big Foot interventions. Patrizia, 63 years old for example said: *"I have got al lot to learn from you, not only how to use the PC and Facebook, but to how to keep living with the same life drive"*. And Carlo, 13 old replied: "*With you it is so easy to learn ... my mum never has the time"*. Or Francesco, also 13 years old years old with physical disabilities stated: "*For the first time when I cook I am not the last one to finish!"*

Berkovitsa, Bulgaria

The town of Berkovitsa is located in the North-West of Bulgaria, in the area of the so called Fore-Balkan to the northern slopes of the western Stara Planina Mountain. The North-West of Bulgaria is one of the poorest regions of the European Union reflected in a negative natural and mechanical growth and comparably high unemployment rates.

Based on the Participatory Mapping of the area and intensive consultations with local stakeholders, the Big Foot experiment in Bulgaria focused on the area of nature and tourism. Engaged in the process of intergenerational learning were the students from one local Middle School (i.e. from 3rd to 7th grade) and senior citizens, the latter avid lovers of the region as well as members of the local organisation of tourist veterans from Berkovitsa and the nearby villages. Big Foot organised excursions and field trips for seniors and school students alike who visited on foot the most popular tourist landmarks of North-West Bulgaria, such as Zdravchenica, Haidushki Vodopadi, Kim, Starkovitza, Todorini Kukli and Lopushna. The seniors took the students to the above places, shared historical facts, legends and poetry and conveyed their knowledge about the local fauna and flora. Amongst the seniors involved were former mountain rescuers, skiers, national champions in orienteering, former school teachers and directors, who also thought the children how to use topographical map and compass, and the basic techniques in surviving in the mountains. Each excursion had the duration of one to two days, during which children were familiarised with the local surroundings and engaged in learning, while developing their appreciation and love for nature.

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Figure 3. Intergenerational Excursions in the Mountains of Bulgaria

During the excursions the young generation in turn showed the seniors how to operate digital and video cameras, how to store documents, and explained other features of mobile phones such as GPS navigation. For the next training sessions students under the guidance of ICT professionals will help the seniors to acquire basic digital competences such as communicating trough the Internet and other Social Networks.

When recollecting their impressions of the Big Foot outings, the participants stated: *"I found new friends. I have never been on Zdravchenitza peak before and I loved it."* Or: *"I saw part of our region, extremely beautiful and varied. I learned many legends about it."* Other statements included: *"The feeling of being in the nature as a participant of the Big Foot activities is indescribable; it fills you with vigour, energy and good physical activity."* And: *"Marvellous discussions and shared thoughts and experiences with all participants of the project."*

Trikala, Greece

Trikala occupies the northwest part of Thessaly in Greece. It is largely a mountainous and semi-mountainous area, while its southeast part occupies a part of the great Thessalian plain. The prefecture of Trikala is full of unique historic monuments, of high historic cultural and aesthetic value such as the Meteora Rocks with its monasteries.

The Greek experiment is organised around four thematic sessions i) traditional local products and gastronomy; ii) folklore culture e.g. traditional handcraft; iii) rural heritage and historical monuments; and iv) natural environment and regional rural tourism. The targets groups involved in the experiment are primary and secondary school students as well as elderly persons e.g. from a rural women association, local product workshops, family distilleries of Tsipouro, a local hard liquor, local folklore museum of Pialia, the members of Open Care Center for Elderly in Kalambaka, owners of traditional watermills, and individuals researchers of the area's tradition and history. There is also the contribution of stakeholders such as the Municipalities of Trikala, Kalambaka and Pyli, thePrimary and Secondary Education Directories, the woodcarving school of Kalambaka, the Forestry Department, the Cultural Association of Ropoto etc. Facilitators such as teachers, school counselors and social workers are further supporting the actions of the experiment.

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Each session takes place on a monthly basis. School students and teachers after preparing the thematic sessions in class and participate in visits in the area where elder locals demonstrate and provide them with the specific knowledge traditions and local customs and "stories" that are in danger to be lost due to the intergenerational gap observed.

Figure 4. Intergenerational Learning in Greece

Through this process, the youngster will have the chance to, study their local history and heritage, do projects and gather information regarding each session, collect traditional recipes and folklore music, do research regarding the tradition of the area, former way of life, the historical monuments, the traditional entrepreneurship, agriculture, nature and tourism.

Asked for her experience the director of one of the involved primary schools pointed out that "*many young students have lost their relation to the countryside although Trikala is not New York*". She therefore believes that "*the traditions could be an opportunity against the current crisis*", and suggested that "*activities like these should keep on going in the future!*"

The Conclusion(s)

The Big Foot Experiments on three highly different European grounds have been providing strong evidence to support the benefits of intergenerational learning for individuals, their communities and societies at large such as:

- Uniting segregated generations and building better understanding between generations;
- Encouraging active citizenship and social participation;
- Encouraging cross-generational working;
- Sharing societal and professional resources, tacit and explicit knowledge among generations;
- Challenging social problems cross-generationally;
- Addressing different social & e-Inclusion objectives and competence areas simultaneously;
- Supporting Lifelong and Life-wide Learning;
- Maintaining & building human and social capital simultaneously.

It finally doesn't really matter who where the seniors or who where the youth, as Big Foot simply throws out these names from the recollections the project was privileged to be privy to!

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D2L VS. NING: TEACHER PERCEPTIONS OF THE INSTRUCTIONAL EFFECTIVENESS OF TEXT VS. VIDEO-BASED REFLECTIONS IN AN ONLINE GRADUATE COURSE

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Research study overview

Although especially video-taped reflection has become a significant component of teacher education curricula, research on the use of video has not included a comparison of video-based to text-based reflections. This study examines pre and in-service teachers' perceptions of the instructional effectiveness and impact of video vs. text-based reflections as instructional tools in two human development graduate classes.

Theoretical background

Effective teachers engage in reflective practice. The Interstate New Teacher Assessment and Support Consortium's (INTASC, 1991, p.31) ninth core standard for teachers is worded: "The teacher is a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally." Mewborn (1999) argued that pre-service teachers need time to learn and practice reflective skills in a non-evaluative environment. Bullough and Baughman (1997) asserted that the first five to seven years of teaching careers constitute the novice period; these years should be marked by ongoing reflection, typically in the form of journaling: diaries, notebooks, dialogues, integrative entries, and evaluative entries (Sileo, Prater, Luckner & Rhine, 1998). Experienced teachers also benefit from ongoing reflection in similar formats (Bean & Stevens, 2002). For pre-service or in-service teachers who are reflecting on their teaching practice as they do it, not simply reflecting on a past experience, reflection typically leads to the solution of specific practical problems (Smith & Hatton, 1993). Styler and Philleo (2003) recommended the use of technology to enhance reflective journaling. Whipp (2003) reported on research about teacher candidates engaging in field experiences in urban middle schools in which teacher candidates engaged in increasingly higher levels of reflection because of online discussions. Rodgers (2002) proposed four phases in the process of reflection, asserting that reflecting on action becomes practice for the reflection in action, necessary for teachers who must make decisions and responses on the spot repeatedly throughout each teaching day.

As a result, for the past two decades reflection has become an increasingly significant component of teacher education curricula (Cheng & Chau, 2009; Clarke, 2009; Kong, 2010; Jones & McNamara, 2004; Leung & Kember, 2003; Pollard, 2000; Rhine & Bryant, 2007; Rodgers, 2002; Schon, 1983; Sturges & Reyna, 2010; Wang & Hartley, 2003). Avgerinou, Carroll, Spelman and Hanlon (2005) note that "custom design of reflection opportunities appears to be the best choice for teacher education professors. This is especially true when those custom designs are based on the instructional design (particularly objectives) and delivery of the course, strengths as well as specific needs of the teacher candidates and their instructors, and the ongoing call for thoughtful reflection in a "people-based" profession where infinite variables continue to influence effectiveness." (p.27)

One popular form of reflection is conducted on videotaped records of teachers' field experiences, and/or practice. However, research on the use of video in that context has not included a comparison of video-based to the traditional text-based reflections when both focus on linking theory to one's own past personal, and current or future professional experience.

Research context & methodology

This study examines pre and in-service teachers' perceptions of the instructional effectiveness and impact of video vs. text-based reflections as instructional tools in two human development graduate classes. The study addresses the following questions:

1. Is the visual reflection experience different to the narrative one? If so, how?
2. Are there any pluses, or minuses in reflecting visually vs. reflecting via text?
3. What does the participant like/dislike about the visual reflection experience?
4. What learning occurred for the participant during the video reflection experience?
5. How does the participant report that s/he has already applied, or would apply it?

This descriptive study (survey) has involved 16 pre and in service online students (8 females, & 8 males). Of those, 11 participated in the regular academic quarter run of the course, and 5 in the summer quarter run of the course.

As this project nears its completion, more students have participated in this study throughout the regular academic quarter runs of the same online class. While data analysis is still underway, results presented here are preliminary and refer only to data collected through the 16 participants mentioned above.

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As part of the assessed coursework of two Human Development classes, occurring one during the regular academic spring quarter (11 weeks) 2011 and one in the Summer quarter (5 weeks) 2011, students are required to:

- *Regular Quarter Students*: produce four text-based self-reflections and three text-based critiques of other students' reflections. These are posted on D2L. Students are also required to produce three video-based self-reflections (3 minutes) and three video-reflection critiques via YouTube, and to post them to our private Ning platform (Figure 1).
- *Summer Quarter Students*: produce three text-based self-reflections as well as three video-based self-reflections (3 minutes). The text-based reflections are posted on D2L whereas the YouTube produced video-based reflections are posted on Ning.

- *Both groups*: As an optional activity and following instructor-set prompts, students can produce speed reflections (max 150 words) on their experience as contributors and viewers of videos. Thus speed self-reflections are used as informal surveys within the context of this study.
- This study has utilized all aforementioned visual and textual materials which are treated via the content analysis method.

Extra credit has been offered to those who consented to participate in this study by submitting their speed reflections to the Ning platform. There are no consequences for those who do not wish to participate. The study does not present any conceivable risk to vulnerable populations although at this point the instructor is not aware of any such being part of the human development class. Once final grading is submitted for all participating classes, and all video and text-based data are collected and codified by the instructor, data will be removed from Ning and from the D2L platform. Data is stored in the instructor's computer which is password protected.

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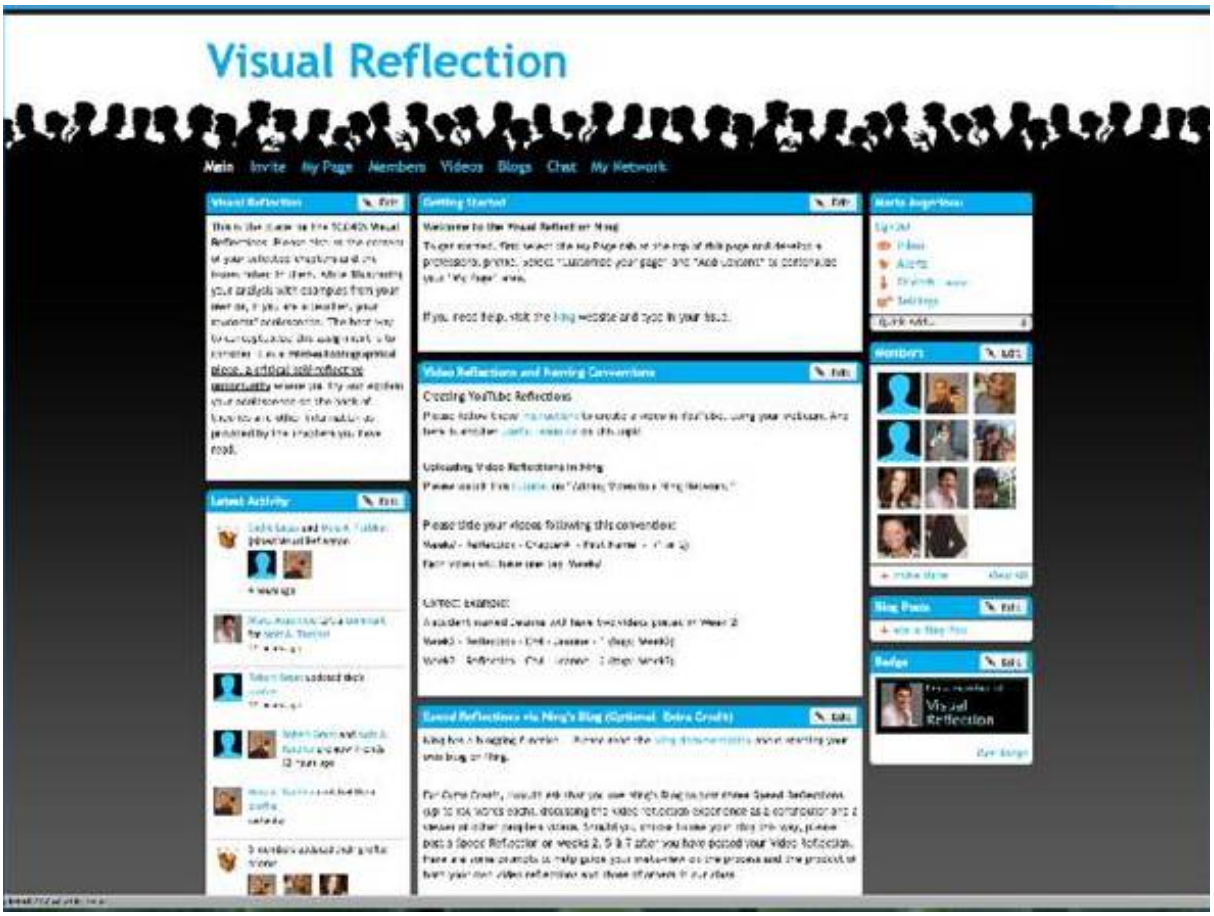

Figure 1. The Visual Reflection Ning

Results

As this project nears its completion, more students have participated in this study throughout the regular academic quarter runs of the same online class. While data analysis is still underway, results presented here are preliminary and refer only to data collected through the 16 participants mentioned above. *NB. By the time of the conference, all data will have been analysed and ready to be presented. This is why I am not presenting any numbers or percentages at this point.*

Question 1: Is the visual reflection experience different to the narrative one? If so, how?

Overall, students found the visual reflection experience more challenging than the narrative both in terms of production and in terms of sharing.

Production is discussed in terms of comfort with technology, as well as comfort with speaking in front of the webcam while trying to keep focused on, and concise in the discussion of the reflection topic.

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Sharing is identified as difficult because some reflections are considered too personal to be recorded.

A few students reported that written reflections are more straightforward and take fewer steps to be produced. Written reflections are also more comprehensive while video reflections may sound like ramblings if not focused on a particular topic. One student reported that if focused, a video reflection can be as insightful as a written blog.

Students report that experience and practice of producing self-video reflections, personal presentation style on camera, as well as interest in reflection topics are factors that affect the quality of the final video reflection as much as they would with a written reflection.

Question 2: Are there any pluses, or minuses in reflecting visually vs. reflecting via text?

As advantages of reflecting via a visual vs. a text-based narrative, students report that in visual reflections one can (a) see/hear others' talking, which creates (b) a more personable sensation overall, in particular due to (c) the conversational and casual style which is (d) more like a live classroom discussion only (e) more concise (due to the 3 minute limit), and (f) more constructive. Students also report that (g) visual reflections allow "getting to know" others online, and also (h) support the use of new technology

Among disadvantages students report such facts as (a) the steep learning curve of the overall experience; (b) the production of a visual reflection is time consuming and requires a lot of practice; (c) the editing of the entire video even if just need to correct one section; and, (d) the need to produce multiple videos to end up with a final one. In addition, students shared concerns about (e) online privacy, (f) lack of eye contact, (g) digital stage fright experienced when one feels self conscious and perhaps easily distracted in front of the webcam, and, (h) how challenging the visual reflections may be for non-native English speakers, but also (i) how less focused and less comprehensive because of their casual and conversational style.

Question 3: What does the participant like/dislike about the visual reflection experience?

It was not easy to distinguish between responses that related to Question 2, and those referring to Question 3. In other words, typically what was discussed as advantages of the visual reflections was also liked by the students, whereas what was reported as disadvantages, was also disliked by students.

Question 4: What learning occurred for the participant during the video reflection experience?

Overall, students reported developing their technology skills as a result of participating in the visual reflection activity. Production of the videos and then embedding them into the Ning,

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albeit a challenging adventure, was viewed as more educationally rewarding than just participating in online discussions via posting e.g. VoiceThread comments.

There is no specific mention to their critical reflection skills and how video reflections helped develop them (or not) further.

A few students have become more aware of issues such as producing a visual that can effectively attract and maintain the audience's interest, and, protecting privacy and confidentiality online.

Question 5: How does the participant report that s/he has already applied, or would apply it?

Participants report that they are satisfied with the technology skills they have developed as a result of activity, and would attempt to use both YouTube and Ning in their current or future classes.

They are impressed with the creativity aspect of such projects, and their educational potential.

They also report that due to using the specific technology, they now understand more the digital native generation, but they are also more mindful with such issues as privacy and video-recording minors in schools.

Discussion and conclusion

Despite the fact that most students admit to the many advantages of the video reflection, and report feeling more comfortable with practice thus more satisfied with the 2nd and 3rd video reflections, they would still opt for the written over the video reflections.

This feeling is also shared by students who identify themselves as auditory learners and who at the beginning of this experience seemed to be more favourable toward it than producing written reflections.

This result is readily understood for the data set collected via the Summer Session, where students had only three weeks of exposure to the video reflections.

It is not however as easily justified for the regular quarter students who experimented with video reflections for about 10 weeks.

Therefore more follow up research in the form of targeted interviews is required. At the same time, perhaps more exposure to video reflections should be required (i.e. increase them to more than 3) for future classes.

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EDUCATIONAL GAMES: PROPOSALS FOR INCLUSION IN THE PROCESS OF LEARNING WITHIN THE FRAMEWORK OF KNOWLEDGE MANAGEMENT

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Overview

Educational game stimulates the acquisition of a discipline, goes beyond acquiring knowledge and developing skills and contributes to achieve greater motivation in students. Although educational games may or may not be supported by ICT, ICT have triggered their development and use in recent years due the following features: easy development and programming of rules, friendly GUIs and platform portability among many other things.

Considering the above, the Coordination of Open University and Distance Education (CUAED) entity of the National Autonomous University of Mexico (UNAM), who is responsible for providing technology, intellectual and material support to academic institutions that belonging to the UNAM for the development of ICT supported instructional materials for classroom and distance learning modalities, has encouraged the development of educational games in their various formal and informal education projects, so, on this occasion will present two proposals made: educational games as self- assessments in open online courses and educational games as exercises in a teaching support portal.

Introduction

Huizinga cited by García & Llull (2009) notes that "(play is) a free activity standing quite consciously outside "ordinary" life as being "not serious", but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social groupings which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means". (García y Llull, 2009).

Game is a human activity that has been present throughout history. The game is generally associated with childhood, however, their presence is noted along the entire life of people. As the game is related to fun and relaxation, it is considered an activity opposed to work, despite this, the game is a means through which societies pass their culture to their members, i.e.,

values and norms of conduct and conflict resolution so that they can develop their personality. All this demonstrates the complex nature and operation of the game, which is why it has been approached from very different theoretical frameworks. In this sense, from the educational point of view, the game supports the development of all aspects of the individual so that they can integrate into society, least because: develops in the imaginary world, with freedom and little responsibility; involves people with cultural traditions of the society in which live achieving more familiar and meaningful learning and supports the regulation and organization of joint activity, consensus and social conventions.

The features of the game that Garcia and Llull (2009) refers are: the game is free, the game gives pleasure, play a game involves mental and / or physical activity, play is innate, the game has an intrinsic purpose that is enjoy the leisure activity (*autotelismo)*, game organizes actions in a proper and specific way, game is a way to interact with reality, game is a way of self-affirmation, game promotes socialization, game is limited in time and space but is uncertain, because the game is a on-motivator item, has been often used in education to make homework more fun or to achieve specific learning goals by performing a playful activity.

When the game is introduced in a learning environment with clear and specific objectives creates an enabling environment for a fun, effective and productive teaching-learning process. Regarding the educational game Prieto (1984) states at "the so-called educational games ... are made in such way that cause the exercise of mental functions in a general or in a particular way" (Prieto, 1984).

Pers (2009) presents a very comprehensive overview of the educational game features, grouped into two main areas: Form-related (playful, funny, emotional, participatory and reflective component; not left to chance educational purpose and without punishments; colours use according to the theme and eye-catching; legible, understandable and conventional fonts and clarity and understanding on the distribution and arrangement of elements) and Content-related (oriented to a specific working subject; specific working objective; clear, concise, specific and appropriate language to the audience it is directed; instructions describing the contents of the game and the processes to follow to complete it; a specific work content to give participants the tools of reflection and thematic analysis; promotion of qualitative or quantitative learning assessment to define achievement of competencies and capabilities of group and individuals.

The role of educational games in a teaching-learning environment is: promote interest in the contents, stimulate the decision making, foster collaboration, implement and consolidate the knowledge acquired and encourage the development of skills, propose dynamic educational activities and encourage a students behaviour change.

Including educational games in learning environments has some advantages such as allow new content presentation and review and consolidate learning, cause pleasure and develop creativity and imagination achieving creative game and fun learning and assist in the

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conversion of the student as an active element of the learning process making him protagonist of the educational act.

Considering as a fact the inclusion of the game in the teaching-learning environments, has been sought new ways to present it considering the wide range of possibilities offered by the Information and Communication Technologies (ICT). There are multiple signs that support this union, like the benefits that ICT offer to the educational such as: availability at any time and anywhere; teaching-learning process where the student is the protagonist; reduction of operational restrictions; self-assessment during the process; tracking by feedback, add of complementary cognitive dimensions of teaching and learning, and self-assessment that generate a greater satisfaction. Also support the dual educational games-ICT the media contributions to the teaching-learning process including: upper and stimulating learning; learning is achieved in less time; interactive features to enhance a positive effect on the learning; and achievement of improved individual understanding based on activities group.

With respect to the benefits that educational games supported by ICT bring to the teaching-learning processes are: closely related theory with real-life situation, bring innovation, variety and usually immediate feedback, provide an environment that surrounds people for long periods of time and where they return frequently; allow the acquisition of large amounts of information; a process that is reinforced by repetition; propose an innovative method to reinforce the facts and to acquire knowledge and skills; promote critical thinking and solving problems; making use of the action instead of explanation; motivate themselves and produce personal satisfaction; adaptability to multiple learning styles and abilities.

According to Ulicsak and Wrighr (2010) educational games mediated by ICT can be grouped according to their underlying pedagogical method. Thus there are three types:

- Those based on behaviourism called *edutainment*. These games tend to be based on assessments.
- Those based on cognitivism that allow the player to identify and analyze problems and apply prior learning, and based on constructivism that allow the player to learn by doing.
- The multi-model based learning (constructionism, experiential learning theory, the Kolb Learning Cycle and active experimentation).

Several organizations, including universities, can develop knowledge management through three main approaches: the process approach, the practice approach and best practice approach. The development of educational games highlights the use of the process approach that attempts to codify organizational knowledge through formalized controls, processes and technologies. Organizations such as the UNAM adopting the process approach can implement explicit policies that govern how knowledge is collected, stored, and disseminated throughout the organization. The process approach often involves the use of ICT to enhance the quality and speed in the creation and distribution of knowledge in organizations. These

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technologies may include intranets, data warehousing, knowledge repositories and tools to support decision making and teamwork.

Development

Creation process of ICT-supported educational games developed at UNAM

An important part of the proposed educational games in learning environments developed by UNAM have evaluation and exercise purposes and therefore fall into the category of *edutainment*.

Games that support the self-assessment are based on the principle of multiple choice assessments, which are preferred by players of the educational process because: the correction is made immediately; allow the creation of different versions of the assessment with the same questions; the review takes less time allow covering more content by generating more questions. Therefore, the trivia game was selected to support self-assessment processes. The trivia as educational game consists of a series of questions with a response usually short or multiple choice. The player is questioned and must provide the correct answer, because if it were wrong, the game should indicate which the correct answer is.

By the other hand, educational games as exercise to support teaching were developed in response to the "Common European Framework of Reference for Languages: Learning, teaching, assessment" that refers the role of the playful component in learning and language development. The purpose of educational games mediated by ICT to support the teaching of a language is that the students develop certain skills within a framework of thought and action. It also improves the performance of voluntary repetition of the game, increasing understanding with each repetition.

The development of both types of games is embedded within the instructional design process of a course or a thematic unit and generally comprises the following steps:

1. Develop learning objectives that the game must satisfy focused on the student.
2. Decide game elements, such as configuration, number of players and concurrency and type of interaction between game and players.
3. Development of a game design document, which in this case is comprised within the course or thematic unit instructional script.
4. Integrate content into challenging dynamics of the game, which makes the expert in conjunction with the instructional designer.
5. Define presentation mechanisms, choosing between textual models (questionnaire) semi-textuals (crossword) and graphics (memory).
6. Game generation, this occurs when the script is sent to the graphic design area where it is then integrated into an authoring program.

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7. The game is reviewed in structure and operation by the expert and instructional designer to review that meets the specifications. If they find errors in the integration, return to graphic design until done.
8. The game is composed and published in the course or subject for which it was designed.

Distribution process of ICT supported educational games developed by UNAM

Using the methodology described above, various academic institutions supported by the CUAED have developed educational games supported by ICT, which are distributed in two major projects: Educational games as self-assessment of open online courses and educational games as exercise in a teaching support portal.

Educational games as open courses online self-assessment

The open courses online are found in a website where reside various open resources with varied themes accessible to anyone (http://distancia.cuaed.unam.mx/recursos/). These courses have objectives, content, learning activities and self-assessments, to enable people to make their learning independently. Educational games are present in the area of self-assessment trivia with model described previously. The trivia can take simple forms as related words questionnaires or true-false questionnaires, more advanced forms such as crosswords, word search and armed summary tables incorporating the right words, or more graphic and developed forms by converting board games memory such as text with image, text image ratio and rally.

Educational games as exercise in a teaching support portal

By example, the portal called English Media (http://www.cuaed.unam.mx/english_media/), hosts electronic materials that help to consolidate learning English as a foreign language in the form of four skills (speaking, writing, reading, listen) or extend the practice and exposure to the foreign language independently. The resources are organized in levels (A1, A1+, A2). Each level shows different themes. Each theme opens a window that displays the contents of the subject and a menu with the following options: learning activities, trivia and glossary. Getting into the trivia option, you can choose a trivia for each skill to be developed. The trivias were developed interactively and with a variety of multimedia resources. These trivias allow that the learner do exercising processes to achieve the permanence of knowledge.

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Conclusions

The development of these educational games mediated by ICT has involved the organization of multidisciplinary teams where participating content experts from various schools of UNAM, while the other group members are provided by the CUAED (instructional designer, copyeditor, designer graphic, programmer, etc.).

Such proposals derived from interest that UNAM has established to incorporate *The Knowledge Management* into their activities, using in this specific case the process approach, seeking to improve the steps to create and distribute knowledge of academics supported by the ICT, for the benefit of the entire university community.

For the development of these games was developed a methodology that starts with the definition of the learning objective that includes a playful component and consists of eight major steps described above, which has been improved annually. The purpose of including educational games in open online courses was to support students in their process of self learning through playful self-assessment mechanisms that make the learning process more enjoyable.

Regarding English Media Portal were addressed the recommendations of the Common European Framework of Reference, and in this case, are a teaching support mechanism allowing to the students exercise the learned and increase their level of competence.

The purpose of both developments was to support students in their learning process, however, lack the evaluation stage of educational games to confirm if they have met the goal.

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A GAMIFICATION PLAN DESIGN EXPERIENCE FOR PROMOTING ENGAGEMENT AND ACTIVE LEARNING IN AN UNDERGRADUATE LEVEL COMPUTATIONAL SCIENCE COURSE

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Summary

Motivation and engagement are often the most difficult elements to promote in a student. Game principles can give us insights on what makes activities fun and relevant to learn. Game based learning (GBL) or gamification in education, enhances the learning process, by inviting the student's own personal game experience, into a non-game environment. Independently of the educational delivery model, learning environments can gain much more effectiveness when merging learning activities and basic lucid principles. A gamification plan design is presented, for a hybrid/blended undergraduate course in a computational science (Physics).

Introduction

Gamification in Education refers to the incorporation of game elements, mechanics and dynamics in learning activities in order to motivate or influence student's learning. This can be achieved by granting badges, assigning experience points for each accomplishment for a long term goal, handing extra points for solving complex challenges, and a clear mechanism for transition to higher levels. Gamification can help students engage, helping them making connections and to integrate easily to a will defined learning community, where they can socialise or work as teams (EDUCAUSE, 2011).

We all play, it is in our nature (Huizinga, 1955). Playing is fun, playing is different than ordinary life, playing gives us freedom to explore, to learn, it demands rules, order and poses challenges. There are no material rewards, only personal joy and intellectual challenge, which is motivating and engaging.

In order to engage a player, a good game design must include: a continuous challenge, an interesting story, flexible or multiple choices for achieving goals, immediate feedback and useful rewards, combine fiction with reality. A player wins a game either by competing against other players or beating the game. The major reward is social recognition among peers and/or promotes self-confidence.

Gamification in Education is about engaging and motivating students, making learning fun. There are three basic characteristics that defines a game: A clear goal or win condition; some difficulties or obstacles along the way; and collaboration or competition among peers (Smith-Robbins, 2011).

In gamifying a specific student course, we will have to consider a non-traditional academic approach, by defining a game play, a reward system for activities, designing significative quests, determining experience levels and promoting collaborative work and healthy competition among students.

In this work, a gamification plan is presented for an undergraduate course in computational sciences (Physics), at the University of Sonora in Mexico. The course develops in the context of an open social learning environment, supported by Web 2.0 tools, open educational resources and free and open source software. The course focus is in developing skills in the use of scientific software tools and programming environments used in real life scientific computing. Simultaneously, it promotes the development of transverse skills such as problem solving, reading in a foreign language, writing scientific papers and presentations, using ICT tools, participating in collaborative work, time management and self directed learning. The course topics in Computational Physics are used to situate learning in subjects that students already know and are familiar from previous courses, but with a higher level of complexity, which can be studied using appropriate computational tools that enables a more in-depth knowledge, easing answers to new derived questions in a specific physical phenomenon (Lizarraga-Celaya & Diaz-Martinez, 2012).

Methodology

The course being gamified, has currently the following structure, which is iterated thru six main topics, advancing in required computational tools skills and physics problem complexity.

The general purpose computational tools are introduced first, and new specific tools are introduced as required, as long as they justify their use and have wide scientific community acceptance. Along the course each tools is incorporated iteratively, in following topics, seeking further development of advanced skills and proficiency.

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Table 1: General knowledge map of the computational science course.

Process	Statement of problem	Problem solving	Academic report preparation	e-folio construction	Learning self-reflection	Participation /Collaboration
Objective	Define a specific problem to solve	Learn methods and use tools available to help solve problem	Develop technical and scientific writing skills	Visualise learning evidences and student progress	Exteriorise experiences gained in the learning process	Integrate to the learning community
Resources	Online information, software repositories, documentation	Open educational resources, open content scientific journals	Online documentation, forums, groups	Online file hosting service	Personal Blog for the course	A closed group in ac social network service
Social Capital	Available scientific knowledge and literature.	Professional scientific communities of practice	Own previous experience, peers, advanced experts, online documentation and examples	Own previous experience, peers, advanced experts.	Previous own learning experiences	Connected friends and peers.
Tacit Knowledge	Subjective insights, previous knowledge and experience	Previous knowledge, actions, experiences	Previous knowledge, actions, experiences	Previous knowledge, actions, experiences	Previous knowledge, actions, experiences, internalization	Socialisation, externalisation, combination

The main topics of the course are:

1. Scientific programming environments.
2. Scientific and technical documents preparation.
3. Programming languages and libraries.
4. Scientific plotting and visualisation.
5. Numerical solution of problems.
6. Symbolic solution with computer algebra systems.

The course development consists of a variety of assignments and tasks, which involves downloading and setting up software, engaging in learning activities like web quests, problem solving, elaborate products, upload learning evidences, write their learning reflections, take quizzes for self-assessment and participate in the online social network work. This may be an example of a traditional course. Points and grades are given for the different student accomplishments.

The gamification plan

First, we define a few game elements for the course management and student participation. The methodology implemented is similar to the one implemented by Haley (Haley, 2011), but adapted to our context and course goals.

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The elements of game in our gamification plan are:

- Badges, are given as rewards for different levels and types of accomplishments
- Rewards for the different number of badges and types.
- Methods of levelling-up, after completing assignments and tasks of the specified problem being solved.
- Experience points (XP). As in games, XP can be used for defining grades, obtain accomplishment badges, earn some privileges, etc.
- Variety of options to achieve XP: Reports, presentations, quizzes, mind maps, in-depth documents.
- Quests, which can be a specific problem to solve, a specific software installation and configuration, an in-depth report of a specific technique, method or tool.
- Story-lines. True quests develop along a structured, interesting and engaging storyline.
- Promote participation by voting class activities, promoting experience feedback thru forums and discussions.
- Knowledge map, which show the progress of the course. In gamification, it is the curriculum mapped into a gaming sequence, so that students can follow. Make progress transparent to the learner, so they can track their advance.
- Challenge students with an attractive game play, that fosters healthy competition, being fun to play and learn.

Table 2: Example of grading procedure

XP (Experience points)	Game Level	Final course grade
N6	6	A
N5 ->(N6-1)	5	A -
N4 -> (N5-1)	4	B -
N3 -> (N4 -1)	3	C
N2 -> (N3-1)	2	E
0 -> (N2-1)	1	F

Examples for XP (Experience points):

- Assignment report = 20 XP
- Reflection on learned = 5 XP
- Method/technique/tool in-depth presentation = 10 XP
- Well-organised project e-folio = 5 XP
- Providing supplementary online resources = 5 XP

Badges examples:

- Handing-in in time assignments
- Well organised learning evidences and blog
- Frequent collaboration and peer help in technology issues
- Top students of project

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Preliminary results

The plan has been implemented the spring semester of 2013. Results and analysis will be available at the end of the semester.

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GAME-BASED LEARNING: A DESIGN-BASED RESEARCH APPROACH

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Introduction

Participation in science and technology disciplines at the post-secondary level (Alexakos, 2010; Zohar & Nemet, 2002) has decreased in recent years. Even among students who have decided to study science there are serious misconceptions about the everyday practice of scientists and the role that scientists/technologists play in the broader society (Wong & Hodson, 2008). This design-based research study represents an attempt to address deficits in scientific literacy by providing students with an opportunity to engage in real world problem-solving in the context of a digital game-based learning environment.

Design-based research

Although game-based learning has been explored at the K-12 level in many studies not as much work has been done on incorporating gaming approaches in the postsecondary environment. A DBR approach was chosen because it seemed appropriate for a project in the developmental stages (Shavelson, Phillips, Towne & Feuer, 2003) and for situations in which there is a discontinuity between traditional or typical forms of educational practice and those forms that are the focus of the study (e.g., innovative approaches) (Design-Based Research Collective, 2003). Conventional experimental approaches to educational research tend to average out differences between treatments leading to the impression that a particular solution is no different than another. Others in the field of DBR note that the flexibility and responsiveness of DBR makes it particularly valuable in contexts that are evolving and changing which is certainly the case in game-based educational environments and in development platforms like MUVEs. In the absence of an established approach to studying learning in the context of a digital educational game, a DBR approach was selected as one of the better research paradigms for this study. There are four basic steps in a single DBR cycle:

1. Problem formulation based on a review of the literature on a relevant topic (e.g. scientific literacy, educational game design principles and applications) and discussions with various stakeholders
2. Solution designed to address the particular problem or issue (e.g. scientific literacy among undergraduate university students).

3. Evaluation of the solution (game prototype) through an evaluation process.
4. Derivation of a set of design principles or set of actions on feedback from stakeholders)

The problem

Several authors have argued that a scientifically literate populace is necessary to effectively deal with complex issues such as climate change (Covitt, Gunckel & Anderson, 2009). Over the decades science educators and scientists have explored different ways of increasing scientific literacy. One of the more recent approaches to this problem has been to ask students to solve ill-structured problems in relatively risk free settings (Belland, 2010; Krajcik, McNeill & Reiser, 2008). Other researchers in the area of scientific literacy suggest that contextualizing a topic or issue for learners (e.g. making it relevant to their lives and personal experience) leads to increased knowledge retention and improved scientific reasoning (Rutherford & Ahlgren, 1990).

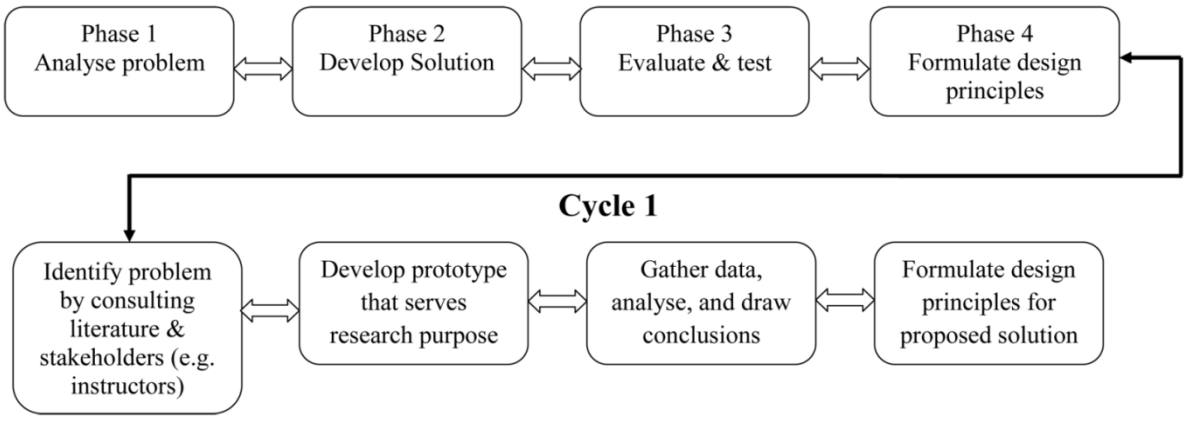

Figure 5. Flow chart of a single iteration of a DBR project adapted from Ma and Harmon (2009)

Traditional teaching methods, such as drill and practice (Alexakos, 2010), have been identified as factors that might contribute to problems with student motivation and participation in the sciences. Many authors argue that educators need to change educational approaches to fostering scientific literacy by creating engaging learning activities that support project and problem-based learning (Belland, 2010; Krajcik, McNeill & Reiser, 2008) in the context of knowledge building communities.

Some recent efforts have examined the use of game-based learning and simulations in the teaching of content knowledge in science and scientific literacy (Barab, Scott, Siyahhan, Goldstone, Ingram-Goble, Zuiker & Warren, 2009; Toro-Traconis, Meeran, Higham & Mellstrom, 2010).

The first stages of this project were the literature review and a series of consultations with three science instructors at a western Canadian university. The first consultation with the science instructors revealed that they shared many of the same concerns about the scientific literacy of undergraduate students with other science educators and scientists. They also expressed some concerns about the use of technology to address the issue of scientific literacy. These concerns were recorded through hand written notes that were taken by the researcher

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and a third party. A second consultation took place in an early prototype of the game that had been developed in Second Life and involved a discussion of the prototype, strategies for participant recruitment, the kinds of activities that players were expected to engage in based on their particular stream and a conversation about the organizing theme of the game (carbon sequestration). The notes from this session s were saved as a text chat session that was recorded by the researcher. The third consultation involved a face-to-face discussion between the researcher and the instructors about the potential for a pilot of the game in one of their classes, the revised game theme (water resource management).

The Solution

The solution to the problem of scientific literacy pursued in this study was an alternative reality game The players individually assume the role of experts in one of four fields (chemistry, biology, health and geology) and are asked to collaborate with their team mates to come up with a list of possible impacts of water quality and availability on human and animal health, industry and environmental health. In addition to impacts they are asked to briefly outline possible responses to climate change that will help mitigate its effects.

Mystery Narrative

Player's also encounter clues related to the murder of a security guard at a research facility in the town and they are asked to relate their findings to the mayor. In the process of searching for clues to the identity of the security guard's killer they are encounter information related to their and other player's expert streams. At the crime scene, players find a body (that of the security guard), and a potential murder weapon (a pipe located near the body). Figure 2 shows the crime scene that has animated elements (e.g., smoke).

Figure 2. Crime scene with dynamic elements (animated smoke) and information about the murder

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Game Design Principles

The game design principles derived for this study were based in part on an analysis of seven existing game design models, principles and rubrics.

1. Pervasive Game Design Principles (Thomas, 2006)
2. Interactive Environments for Cognitive Apprenticeships (Leekuil et al., 2003)
3. Design Principles for Effective Learning in Massively Multiplayer Online Games (Rosario & Widmeyer, 2009)
4. RETAIN Game Design Model (Gunter, Kenny & Vick, 2008)
5. Game Object Model Version II (Amory, 2007)
6. Design Criteria for Constructivist Gaming Worlds (Whitton & Hollins, 2008)
7. Rubric for Evaluating Higher-order Thinking in Video Games (Rice, 2007)

The principles are summarized in Table 1.

Table 1: Game Design Principles Applied in Study

Principle	**Description**
Relevance	Instructional content is presented in a way that is relevant to the learner and which contextualizes learning experience.
Distribution	Information is distributed between players, non-player characters and through objects in the environment.
Interaction	The environment facilitates interaction between players as well as between players and objects in the environment.
Engagement	Game draws players because of its compelling subject matter and because it allows players to assume roles outside their normal experience
Support	Supports (e.g., just in time help) are provided that allow players to complete the game mission and explore the environment.
Narrative	Instructional content is embedded in the fantasy element of the game and is closely linked to a storyline such that players become immersed in the game.
Articulation	Expression of knowledge, reasoning process in context of a particular knowledge domain.

Conclusions

When the researcher began this project in 2007 there were few digital educational game design models however, since that time more researchers have developed game design principles. Built into DBR is requirement for stakeholder consultations, e.g., instructors, instructional designers, content experts, and learners. This study showed that feedback from instructors, content experts, learners and instructional designers can, over time, greatly contribute to an understanding of the effectiveness of a particular educational innovation. Designers do not always have access to the contributions of peers and those for whom they design (e.g., learners) and DBR presents the researcher/designer with the opportunity to gather discrete information about what does and does not work with a design, and with the technology being used to implement a design, and to incorporate this feedback immediately into ongoing design and development.

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LEARNING BY USING THEMES FROM STUDENTS' AREA OF INTEREST

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Abstract

In this study, to produce a more effective learning process, university students were asked to form works according to their personal area of interest at the last weeks of the scheduled program, and the achievement was investigated considering the previous semesters. The research is a case study which was implemented in the course "Educational Psychology" with 14 graduate students. The expressions and representations of students on the content of the "cognitive learning theories" course varied on a large scale of themes from nature to the computer games. Findings revealed a significant positive effect of this activity on students' both understanding and embracing the subject.

Introduction

In today's world which has a rapid development together with globalization, individuals who reach, interpret, and produce new information, and thus respond to the needs of the decade are brought in the foreground, rather than the ones who only acquire knowledge. In this context, educators are responsible in guiding individuals to achieve these characteristics, because bringing up well-qualified people can only be obtained by education (Aybek, 2007).

The aim of education should be teaching students how to think instead of what to think. This process must possess student-centred instruction and process evaluation, where students are actively involved in and can make self-evaluations, which directly enhances their development (Varış, 1996; Bassham et al., 2002).

It is stated that active learning is effective in students' advance in terms of revealing their cognitive activity (Harmin & Toth, 2006)[4]. In today's world, schools must possess learning environments where individuals are encouraged to make their own work by their experiences, opinions, and questions (Burke, 1999). Reflection of individuals' opinions about their own learning must be considered together with the feedbacks of teachers (Arter et al., 2007). Students must be active, and the process must be interactive throughout the studies (Walker, 2003; Babcock, 2007). Students can be able to easily see their learning and progress (Crawford

et al., 2005). Results of studies in the area show that students who are aware of their own learning process obtain greater achievement (Wormeli, 2004).

Method

In this study, to produce an effective learning process, students are asked to form works for the cognitive learning theories course according to their area of interest (other than their study program; i.e. arts, nature, culture) and their achievement is investigated considering the previous tests. The research is a case study which lasted for 4 weeks with the group consisting of 14 university students, and the study was implemented in the course "Educational Psychology" which exists in the third semester of the "Curriculum and Instruction" graduate program. The expressions of students on "Cognitive Learning Theories" varied on a large scale which includes:

- Nature: with representations by plants and animals,
- City: with representations by characteristics and pictures of the city,
- Arts: with representations by paintings, sculptures, and architecture,
- Sociology: with representations by fictional election interviews for presidency,
- Cartoons: by using popular animated characters, and
- Games: with representations by selection of doors in which a correct choice and points exist.

In the theme "Nature", the work was constructed on numerous living and non livings in the environment around us (Figure 1).

Figure 1. Random pictures from the work using the theme "Nature"

Another study, referring "Sociology", was formed on a fictional election script where theoreticians emphasize the importance of their theories for developing a new curriculum in turns, namely; Pavlov for classical conditioning, Vygotsky for cultural internalization and language, Piaget for developmental stages and schemata, Bandura for social cognitive theory, and Hebb for neuropsychological theory (Figure 2).

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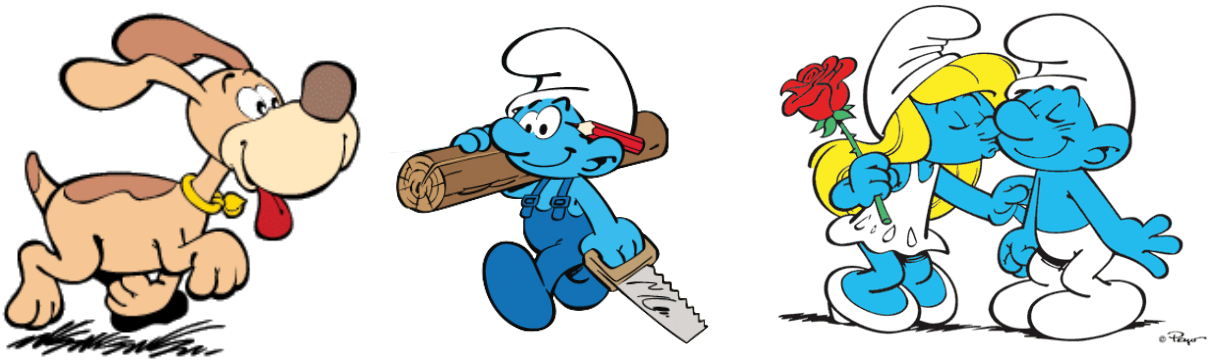
Figure 2. Pictures from the work using the theme "Sociology"

The study for the theme "Cartoons" was delivered by using famous cartoon series mainly on the existing features of the characters (Figure 3).



1. Classical conditioning 2. Discovery learning 3. Zone of proximal development

Figure 3. Random pictures from the work using the theme "Cartoons"

The study for the theme "City" was formed by various photographs of Istanbul which resemble main personal and social characteristics (Figure 4).

Bridges of Istanbul – Personal communication Historical city walls – Personal defence

Figure 4. Random pictures from the work using the theme "CITY"

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Likewise, the "Games" theme was constructed on various multiple-choice questions on the subject, all of which have three answers (Figure 5).

Pavlov Skinner Bandura

Which of these doors is the entrance of the house of the theoretician who emphasized the importance of imitating the behaviour?

Figure 5. A sample from the work using the theme "Games"

In the study for the theme "Arts", paintings, sculptures, and relevant architectures were used for describing the theories and their owners (Figure 6).

Figure 6. Random images from the work using the theme "Arts"

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Findings and results

Throughout the process, courses were performed in a constructivist learning environment, and, at the end lectures, students presented their reflections both in the classroom and on-line environment. At the end of the period, focus group analysis is performed; the process is examined by both knowledge tests and interviews, and thus, change in students' achievement and their opinions are revealed.

For determining the difference in the achievement through the knowledge tests, Wilcoxon's analysis is used. The results revealed a significant difference in students' grades (Table 1). The statistical applications were done by SPSS 16 program.

Table 1: Wilcoxon test results of the two processes, with and without themes.

	N	Mean	Std. Dev.	Min.	Max.
Test 1	14	77.86	7.26	65	90
Test 2	14	93.71	5.82	85	100

Wilcoxon Asymp. Sig.: .001

Findings obtained from the analysis reveals that the process where students expressed the content of the course with their own work using their area of interest and getting on-line feedback from the instructor has positive effect on the performance of students. Furthermore, majority of students (71 %) expressed that they definitely would like to have similar activities because it increased their understanding of concepts and principles, task achievement, motivation, and communication with the instructor and classmates, compared to the previous classical processes.

Education is not an affair of telling and being told, but an active constructive process (Dewey, 1916), but still, this principle is generally not used in practice. Besides the fact that it is quite difficult to implement an absolute learning by doing processes in many areas (Schunk, 1995), as done in this study, similar practices can be carried out to increase motivation and achievement of learners.

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REACHING THE GOAL OF ACADEMIC SUCCESS FOR ONLINE STUDENTS: A PSYCHO-SOCIAL PERSPECTIVE

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Introduction

Student dropout, or attrition, is a long-standing area of worry with corresponding efforts to understand the phenomena both in regular on-campus higher education (Hovdhaugen, 2009; Yorke, 2004), in distance education (Kember, 1989; Yorke, 2004), and in e-learning (Yorke, 2004). Part of the motivation for this line of research in the e-learning area is to be able to design study experiences in order to reduce dropout rates and increase retention and student persistence. In fact, Yorke (2004) differentiates the terms retention and persistence. Retention is grounded in the education providers' perspective, being able to keep the students in the institution. Persistence is grounded in the learners' perspective, being able to keep up the study pace and finish the education.

Kember's (1989) longitudinal-process model of dropout from distance education consists of student characteristics, goal commitment, integration components (e.g., academic, social and work environment and academic, social and work integration), and finally the student's cost/benefit analysis. These different factors may work alone or in concert and determine whether the student drops out or complete the distance course.

Student characteristics include age, gender, educational qualifications/ experiences, occupation, region of residence, and parent SES among others. Kember (1989) argued that these factors, although explaining only a small part of the variance in terms of drop out or persistence, may affect the other factors in the model and thus should be included. Goal commitment includes extrinsic, or interest, elements and extrinsic, or instrumental, elements, and there is a relation between level of interest and study persistence. Integration components are the student's integration into the academic/study part of his of her life, and integration of study life onto social and family life, although Kember (1989) states that most research has been focused upon the academic aspects of integration. Important academic aspects are congruence between the student's study approach and the course instructional design, the nature and frequency of contacts between instructors and learner, and administrative support. Important social and work aspects are how the student manages to integrate family and social commitment demands with the study commitment demands.

Yorke (2004), in a review of Kember's model, states that it still is meaningful with a few amendments, specifically concerning the academic integration. Based upon theory of motivation, self-efficacy and self-theory (e.g., learning goals vs. performance goals), he advocates for inclusion of concepts such as sense of belonging with instructors and other students and students' study engagement. More recently, Gunawardena and colleagues (Gunawardena, Linder-VanBerschot, LaPointe & Rao, 2010) included learner satisfaction as an important aspect in online education.

Attrition, or dropout, among the online student population has received a considerable amount of attention from social scientists, universities, as well as both private and public educational institutions. However, few studies have examined the successful online student and how these students have met their goals. The purpose of the present study was to examine possible factors relating to online student success in the academic setting. More specific what student characteristics, goal commitments and academic integration factors are salient when online students reflect upon how the met their goal of successfully completing their online education?

Method

Participants

Participants were students who had completed their high school general studies courses online at the NKI Nettstudier. 368 students were invited to participate in an on-line survey, and we received 87 answers (24 %), and 67 forms (18 %) were fully answered. From the 87 answers, 62 (71 %) were female and 25 (29 %) were male. The students' age was equally distributed over the age categories 25 years or less (24 %), 26-35 years (25 %), 36-45 years (26 %), and 46 years or older (24 %). The participants' home address were located in all 19 Norwegian counties, with the majority of students located in the counties of Akershus (10 %), Hedmark (10 %), Nordland (10 %), Buskerud (9 %), Sør-Trøndelag (9 %) and Rogaland (9 %). The participants' parents had a junior high school, senior high school or college/university education (28 %, 29 % and 24 % accordingly of the mothers and 29 %, 20 %, and 31 % accordingly of the fathers). Their source of inspiration when choosing online education was mainly (i.e., answered *some degree* or *large degree*) the NKI website (46 %), friends/partner (39 %), and parents and other acquaintances (24 %). Teachers and books/magazines (15 %), siblings (14 %), and newspaper articles (11 %) were other sources.

Questionnaire

Based upon the Longitudinal-Process model of Kember (1989) we designed a questionnaire to address student characteristics, goal commitment, online academic environment and online academic integration. Questions pertaining to student characteristics included gender, age, area of living, parent SES, and source of inspiration when choosing online education (see the Participants section above), in addition to reasons to choose NKI Nettstudier as an online education provider. We constructed questions pertaining to the goal commitment section

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based upon the work of Hovdhaugen (2009). The online academic environment section questions were constructed based upon Bandura (2006) and Zimmerman, Bandura and Martinez-Pons (1992). Finally, for the online academic integration section we used scales from Gunawardena et al. (2010).

Student characteristics

Reasons to choose NKI: 11 questions comprised this section of the questionnaire. Respondents rated each items' importance on a four point Likert scale ranging from "to a small degree" (1) to "to a large degree" (4). We performed a factor analysis (a principal component analysis with a Varimax rotation), which identified independent factors that were transformed into three variables:

- *Interest orientation* (e.g., "Use my talents and develop myself"),
- *Further study orientation* (e.g., "University/college GPA-demands"), and
- *Uncertain orientation* (e.g., "My friends' choice").

Internal consistency for the *Interest orientation* variable was excellent (**α** = .92), acceptable for the *Further study orientation* variable (**α** = .70), and poor for the *Uncertain orientation* variable (**α** = .53).

Goal commitment

11 questions comprised the Goal commitment section of the questionnaire, pertaining to future career goals. Respondents rated each items' importance on a four point Likert scale ranging from "to a small degree" (1) to "to a large degree" (4). We performed a factor analysis, specifically a principal component analysis with a Varimax rotation, which identified independent factors that were transformed into three career goal variables:

- *Creative* (e.g., "Design and create something new"),
- *Practical* (e.g., "Use tools and instruments"), and
- *Executive/research* (e.g., "Obtain an executive position").

Internal consistency was good for the *Creative* variable (**α** = .82), acceptable for the *Practical* variable (**α** = .73), and acceptable for the *Executive/research* variable (**α** = .75).

Online academic environment

15 items comprised this section of the questionnaire. Respondents rated the perceived importance of each item on a five point Likert scale ranging from "not important" (1) to "pretty important" (3) to "very important" (5). We constructed four variables with acceptable to good internal consistency: *Planning* (**α** = .77), *NKI net-tools* (**α** = .74), *Cooperation* (**α** = .82), and the dependent variable *Studying* (**α** = .83).

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Online academic integration

11 items comprised the academic integration section of the questionnaire. Respondents rated their perceived study-efficacy for each item on a five point Likert scale ranging from "totally disagree" (1) to "disagree to some degree" (3) to "totally agree" (4). The dependent variable scale *Learner satisfaction* was constructed from six items (Gunawardena et al., 2011), and showed excellent internal consistency (**α** = .92) and. Two independent variable scales from Gunawardena et al., (2011) were used, the *Online self-efficacy* and the *Learner-instructor interaction*. They showed good to acceptable internal consistency with an alpha of .71 and .87 accordingly.

Results

Student characteristics

Reasons to chose NKI: 56 % of the participants rated *Interest orientation* as an important reason (to some or a large degree), whereas 19 % and 2 % rated *Further study orientation* and *Uncertain Orientation* as important reasons (to some or a large degree).

Goal commitment

44 % rated *Creative* career goals as important (to some or a large degree), 29 % rated *Practical* career coal as important, and 35 % rated *Executive/research* career goals as important.

Online academic environment

A multiple regression analysis was conducted predicting *Studying* from the variables *Planning*, *NKI net-tools* and *Cooperation*. Overall the regression analysis was significant, $F(3, 65) = 38.94$, $p < .001$, $R^2 = .64$. Of the predictors investigated, both *Planning* (**β**= .44, $t(65) = 3.72$, $p < .001$) and *NKI net-tools* (**β**= .42, $t(65) = 3.65$, $p = .001$) were significant. *Cooperation* was not a significant predictor of *Studying* (**β**= - .022, $t(65) = -.26$, $p > .05$)

Online academic integration

A multiple regression analysis was conducted predicting *Learner satisfaction* from the variables *Online self-efficacy* and *Learner-Instructor Interaction*. Overall the regression analysis was significant, $F(2, 64) = 59.05$, $p < .001$, $R^2 = .65$. Of the predictors investigated, both *Online self-efficacy* (**β**= .48, $t(64) = 5.71$, $p < .001$) and *Learner-Instructor Interaction* (**β**= .46, $t(64) = 5.45$, $p < .001$) were significant.

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Discussion

Our research question was what student characteristics, goal commitments and academic integration factors are salient when online students reflect upon how the met their goal of successfully completing their online education. The results showed that the NKI online students are of all ages and live all over Norway and that they come from all SES levels, in addition to parents' educational levels being equally distributed. Sources of inspiration to choose e-learning were mainly the NKI website in addition to friends and parents. This indicates that the NKI online studies are an educational possibility that can be taken up by persons from all geographical areas and backgrounds, regardless of SES levels or age. In terms of goal commitment, most rated creative career goals as most salient in addition to further study orientation, indicating that one fifth of the respondents were planning further studies in the next educational level (which is university colleges or universities in Norway). In other words, NKI was perceived to be a real possibility for many to qualify for higher education.

In terms of the online academic environment provided by NKI, the planning tools and other net tools had a significant impact on the studying behaviour of the students. The cooperation aspect, or sense of belonging as Yorke (2004) put it, was not important for the respondents in this study. This indicates that the online environment provided by NKI is an important factor in students' success, and that there may be much to gain from maintaining and improving the online environment. It may also be that the cooperation aspect or other forms of social belongingness may be developed by means of including ever developing social media in the study experience.

Regarding online academic integration, we found that online self-efficacy and instructor-student interaction were important factors for learner satisfaction. The perception was that NKI instructors are able to establish a good online relation with the students. This particular area of service delivery could also possibly have an influence on modes of relations when considering new developments in social media.

Limitations in this study are firstly the percentage of returned answers; an 18 % response rate is in the lower range of what may be expected from an on-line survey. The second limitation is that we had no questions regarding family and social integration; from the respondents' age groups family and social commitments are to be expected. Conducting more detailed interviews with random samples of the respondents could amend this. We still feel that the data we did retrieve are strong enough to be helpful in future developments of the NKI online learning experience. The strategic goal for any educational institution is to provide a successful learning experience for the student. This entails institutional support and guidance, a clear focus on motivation, and providing a learning environment that meets the needs of and inspires the student for future exciting and challenging endeavours. The current study thus provides directions for future research when considering achieving academic success for online students.

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PHRASAL VERBS FOR BUSINESS PROFESSIONALS: EXPLORING LEARNERS' ENGAGEMENT THROUGH THE LEXICAL SET STRATEGY

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Introduction

'*What is the exact meaning in Spanish? How many phrasal verbs do I need to learn?*' These are some questions commonly heard when teaching phrasal verbs (PVs, *hereafter*) in a Business English class with native Spanish speakers. It is known that over the years, numerous studies have revealed that most English learners tend to seek an immediate translation when they cannot comprehend new vocabulary and that they have limited and/or insufficient vocabulary to communicate effectively (Hudson, 2007; Koda, 2007). In the case of Colombian contexts, many business professionals prefer having an explanation for a number of expressions and/or terminology with readily-made straightforward answers (Pérez, 2012). According to Mangeon (2011), there is a specific degree of difficulty that business professionals face when finding the meaning of certain words during the process of understanding complex business ideas in real-life contexts negotiations. From these reports and from personal observations during several class instruction timeframes, it was possible to confirm the testimonials from fellow ESP colleagues: business students seek answers in formulaic sequences.

During the needs analysis stage of this study, data revealed that communication was particularly challenging firstly because there were certain words (lexical items) such as technical and cognate words participants comprehended, though they could not find the logic as to why there were so many prepositions in a sentence. They claimed there were too many idioms and expressions in English that they simply could not understand. It is worth mentioning that in the local context where the participants lived and worked, the spoken language is Spanish where phrasal verbs do not exist. Therefore there was a higher degree of difficulty surrounding the use of this type of lexical item. The students had not been able to make an immediate connection to Spanish, nor had they been able to visualize phrasal verbs in a formulaic and/or sequential manner. This study was nurtured with the idea of examining the efficacy of the lexical set strategy for the introduction of corpus business PVs so that it could also facilitate access to new vocabulary in the real-time speaking conditions of a group of adult B2 business students. Accordingly, this research aimed at answering the question: *What kind of processes do students undertake when they use the lexical set strategy to learn phrasal verbs?*

Theoretical considerations

Emphatically, these students mentioned that they had encountered a degree of difficulty in the context in which they meet with their counterparts. The students referred specifically to face-to-face interactions and conference calls. Furthermore, it was exceptionally challenging for them to interpret the meanings of idioms and expressions, adding to the problems business mediations that already required their utmost attention. This resulted in a conflicting emotional process for them. Additionally, there was a high frequency of hesitations in oral communication orally, revealed through speaking activities in the classroom. In fact, one of the signs that a learner has sequential speech lies in the absence of hesitations (Boers et al., 2006). These are usually represented with pauses or filler words in spoken interactions. In the case of the students, or the case subject of this study, hesitations were rather frequent.

Due to the intricacy of their grammar, PVs represent a colossal problem to most learners (Thornbury, 2006), especially for adult business professionals who benefit from their vast "occupational-specific" vocabulary. Furthermore, another problem is that PVs are *idiomatic,* which does not help the learners either in the sense that PVs are used and understood as single units.

The challenge that teachers face emerges from the application of the most suitable approach when introducing idiomatic vocabulary, such as PVs. With this in mind, the researcher explored the work of Michael Lewis (1993), an author who was able to organize the English vocabulary with the introduction, and presentation of the Lexical Approach Theories and its subcomponents: the lexical item and lexical set. This author pointed out four main aspects:

1. Lexis is the basis for language
2. Lexis has been misunderstood in the sense that lexis does not mean grammar. For this reason, in the learning process it is not a condition to understand the grammatical system per se.
3. The Lexical Approach originates from the fact that language is made of a "grammaticalized lexis and not from a lexicalized grammar." (Lewis, 1993, p.34)
4. Lexis should be the pillars that build all syllabi.

The current strategy for teaching PVs is based on the premise that these are to be taught as "chunks" of information, which when combined may produce various results as it depends on their coherent context. This task will become much easier if most collocations of words are taught in a context that is closely related to the students' real environment. The teacher's responsibility is then to help in the improvement of memorizing these lexical chunks in order to have them accessible for the students when facing real-life communication. As pointed out by Nation (2002), learning new vocabulary via means of lexical sets can have a positive effect when the learner's knowledge of the language is more familiar.

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Methodology

Most of the instruments considered for this research were based on observational techniques derived from recordings (video tape and/or audio files). Additionally, data was collected through a teacher journal, field notes, and interviews. Time and theory triangulation were used for maintaining balance during the process of triangulation (Corbin & Strauss, 1990).

The participants and their setting

The subjects were at a B2 level, as determined by the Common European Framework of Reference for Languages. They were business professionals averaging 45 years of age and who were in upper management positions in their respective companies. Despite these similarities, these students had clear differences. They did not share the same classroom space. In fact, the students were in separate classes and different businesses or industries. As part of their work routines, all subjects of this study were required to travel often to countries such as: United States, England, India, Denmark, and Brazil where they depended on their L2 (English language).

The researcher's role

The role the researcher took during the research was that of a participant observer. The researcher tested a particular strategy and analyzed behaviours to build a bond (Berg, 2001) between her observations and the application of the lexical set strategy as a way for introducing vocabulary. The researcher served as a facilitator and collaborator while the subjects brought information for the researcher. The researcher tackled the problem encountered by the subjects in a certain context and used theories "to explain and resolve the problem" (Berg, 2001, p.187).

Pedagogical implementation

A series of lesson plans based on topics chosen by the students were created (meetings, negotiations, recruitment/training, marketing and budgeting/forecasting). However, in consideration of the fact these adult learners comfortably used cognates in their speech, an interesting mix arose; a list of the most frequent cognates was obtained and, from this, the phrasal verb corpus was designed. In doing so, it became much easier – and less time consuming – to sketch the lesson plans and the materials used for this research. The advantage of mixing well-known and frequent cognates was obvious. The students had already selected the cognates according to their preferences and, therefore, the activities planned helped them link previous knowledge of PVs faster and easier. Furthermore, the sequential order, or lexical set, in which the cognates were organized, depended on each student. The goal was not to control the presentation of new vocabulary during the lessons. On the contrary, the aim was to allow the students to independently select the cognates and later create the sequential order of these according to their own experience and previous vocabulary knowledge. Afterwards,

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they continued with the introduction of new vocabulary, replacing the cognates they frequently used. This was done through flash cards.

In the sessions, the students underwent a process of recycling new vocabulary and assessment. In consideration of the fact the students had to continue with other grammar topics, they were instructed a one hour and a half per week on the topic of PVs. This meant that the students required having sessions on recycling vocabulary so as to increase the practice and the goal of internalizing new vocabulary. The sessions for recycling vocabulary were divided in two categories: one that related to an informative presentation, and a second that related to activating schemata. A final step helped measure the lexical set strategy; this was called the assessment and was based on a formal presentation. It was important to note that all activities took place in oral contexts, as the main goal of this research was to improve speech skills.

Data analysis and findings

In order to maintain coherence and validation throughout the process, data was managed by subjects, instruments, and research question (Cohen, Manion & Morrison, 2007). In addition, emerging results were analyzed according to the principles of grounded theory (Corbin & Strauss, 1990) and content analysis (Cohen, Manion & Morrison, 2007). Three main categories derived from the examined processes emerged throughout the study.

Process 1: Chronological Ordering

The analysis revealed a conscious connection between participants' business lifestyles and the relation of these with lexical set strategy. In terms of the need for following sequential and logical structures, both the lexical set strategy and the participants' business lifestyles are systematically similar. The similarities that were observed provided a positive outcome, as the students were able to seek for materials that would allow them to learn PVs by following a routine-based self-learning approach that fitted well with their work environment. There was a clear relationship with order and time. Participants reported that the lexical set strategy offered an easy and logical order to be followed since they were able to first discover and then extrapolate learning based on the way they implemented the lexical set teaching strategy and the way they engage with their own learning experience to process new information (in this case, the learning of vocabulary in context). Noticeably, it was also found that the logical order in which the participants operated was not universal. The participants had some notable differences in arranging business events chronologically. Furthermore, these business events were tied to the company's culture and, as a result, the participants operated by such classification. For example, those participants who worked for the same company were able to organize the sequential order for planning for meetings and negotiation in the exact same way, whereas other participants followed a different structure, one that resembled the company in which they worked. After this analysis, the researcher found that the work environment and culture of each company had an impact on the participant's classification style.

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Process 2: Visual processing

During the pedagogical intervention, the researcher did not consider the need to provide any different sort of material for the students apart from flash cards in order to facilitate the teaching instruction of PVs. Since the main focus was on the process rather on the tool used, there was minimal attention to such issue during the preliminary phase of the study. The researcher was merely interested in applying a strategy; therefore, the use of the board and flash cards was considered sufficient. However, as the study moved on, the results from the data demonstrated surprising outcomes regarding the ways the participants searched for alternate options that better assist them in the process of learning. As the participants realized no materials were delivered, they started used their handheld devices to take pictures of both flash cards and board explanations. All the participants sought visual aids on their own as means for gathering material for their own study. By using the technology at hand (mostly Android and Blackberry cell phones) and their own hand written notes, the participants demonstrated their engagement in creating effective tools for learning. The study demonstrated that this type of participant has come to appreciate and value the need for material and what it meant in their adult learning process. This readiness for learning increases their motivational level, as it links it with their process of raising their self-esteem (Knowles, 1990). Additionally, the way the lexical approach moves towards a logical and organized structure, the more it becomes oriented towards the adult's life-centred learning direction. In other words, when adults are able to acknowledge that teaching will directly impact their lives, it becomes a motivator. In this research study, the absence of materials fostered the creativeness to hunt for resources that would suit each individual. Either with technology or written notes, the participants found it necessary to create a connection between the lesson and their needs. The participants selected and controlled the tools and stages of their own learning.

Process 3: Awareness of learning styles

In addition to the fact that students applied their problem-solution abilities for generating materials, they also became aware of their individual learning styles. This was a reoccurring concept that arose from the data collection. All the participants demonstrated, in their own appreciation, a correlation between the procedures used for learning, their learning tools, and those of their own work environments. The participants highlighted the importance of placing pressure on their learning so as to achieve their language goals. Although in this research the instructions for learning vocabulary were introduced using task-based activities, the students looked for their own commands for memorizing using visuals. Furthermore they recognized that pressure and repetition is essential for using new vocabulary. When looking into leadership traits and behaviours, it is plausible to explore Theory X and/or Theory Y Managers (McGregor, 1960). In this theory, managers can be classified as either X or Y Managers. The traits of those who are known as Y Managers were very similar to those of the participants of this study. In consideration of the fact these participants need to be "forced" to learn vocabulary, so do Y Managers, who believe that physical and mental work effort is

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natural and seeks responsibility (McGregor, 1960). This responsibility leads to self-direction and self-control to achieve objectives. Therefore the consensus amongst the participants was that they ought to make an effort to work on memorization tactics. This realization comes directly from their leadership behaviours.

Conclusions

The processes that the students underwent when using the lexical set strategy were strategically derived from their working performance. One of the processes was chronological ordering. The second was visual processing through the search for visual aids. The third and final discovery was the learning awareness process and the need to have imposed practice. The investigation showed that the lexical set strategy is effective for teaching and learning PVs, and should be more widely considered as an effective tool in ESP teaching contexts. Furthermore, the strategy offered to its participants the opportunity they desired: to learn PVs in contexts representing real-life scenarios. The strategy also served as a platform for the introduction of new PVs and their meanings. By the end of the intervention, the students were able to use PVs in other contexts accurately and naturally. In conclusion, Lewis' (1993) work offers a technique that suited the needs of the students and those of the teachers as well.

Limitations and Further research

Issues regarding class attendance interfered with the planned schedule of the intervention. Due to the participants' busy schedules, there were times at which classes were postponed, and class planners were reorganized and customized according to the students' needs.

From this investigation, it was concluded that the subjects of this study were not aware of the processes they endured during the learning development and that they needed to be assisted throughout. In future studies, it could be worth examining how the lexical set strategy is used for teaching PV in business and non-business contexts. New investigations correlating contexts and learning process, as well as student motivation to learn new vocabulary could also be developed. Additionally, the level of intelligibility in oral or written production based on the context in which new lexis is taught could also be measured. Furthermore, the effects of certain technologies (such as mobiles and/or PDA devices) on the instruction and learning of phrasal verbs could also be analyzed, given that in this study the use of technology was not directly included in the research agenda but became a salient finding in the process undertaken.

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STUDENT INVOLVEMENT IN EDUCATIONAL PLANNING AS A KEY FACTOR OF STUDENT SATISFACTION

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Constant changes in the Russian economy, globalization in general and joining the WTO in particular and consequently even tougher competition in the market have highlighted the necessity for companies to make their strategies more flexible and adjustable to present day challenges which in its turn has led to the need for training and retraining of their managers and staff. In order to meet such requirements the educational institutions providing such services have also had to reconsider their teaching policies. The Distance Learning Faculty of the Russian Plekhanov University of Economics (FDL) has also been evolving from a backup to the full-time bachelor programmes for young students to a fully-fledged training centre providing both degree programmes and elaborating new educational blocks aimed at updating professional skills and knowledge of companies' employees.

Teaching methods have also changed from simply supplying the learners with electronic textbooks, manuals, lectures and tests to interactive forms such as online lectures, webinars, simulators, virtual labs, etc. New challenges of time have dominated the contents of education for adult learners: if "basic market rules" were enough in the 1990s, now students require up to date knowledge in all spheres of economics.

Concept

After several years of constant involvement in upgrading courses for different companies' staff FDL has come to the conclusion that ready-made programme blocks do not always suit the needs of customers while customising the courses each time turned out to be expensive. So FDL has developed our own way of providing educational services to different learners – on the one hand leading to increased student satisfaction and on the other, improving cost-effectiveness. The basic concept of the approach is to engage the learners in the creation of the curriculum, negotiating schedules and forms of delivery of necessary information, and giving feedback on different stages of the learning process. The students can select from the readymade but constantly updated courses for distance learning, including electronic manuals, tests, lectures and simulators, but if they need some specific knowledge it can be provided by a live lecturer online or face-to-face, and discussed at the seminars and webinars. All the main principles of blended learning were tested on several companies in a pilot project.

The pilot project

The pilot phase included collaboration with four large Russian institutions which differ in size, form of ownership, structure and the industries they work in. The first one was the Federal Water Resources Agency (FWRA), the governmental body managing all state property connected with water resources, the second, the Vishnevsky Institute of Surgery of the Russian Academy of Medical Sciences, one of the biggest multiprofile scientific-research clinical establishments, the third, Ostankinsky meat processing factory, the leading manufacturer of processed meat foodstuffs in the Central Russia and finally Sberbank, the biggest state-owned bank in Russia. Each institution wanted the training programme not only to cover basic modern economic trends but also to be focused on their particular needs: the FWRA was interested in anti-corruption management, the Vishnevsky Institute wanted to concentrate on the effective management of healthcare institutions, Ostankinsky factory was looking for ways to manage innovations, and Sberbank needed the newest trends in banking and banking products. All four institutions are quite big, though three of them can be called "governmental" and Ostankinsky factory is a public company.

The goal of the FDL staff was to elaborate the approach allowing the construction of appropriate blocks of courses in the quickest possible way without damaging the quality.

How it worked

To make the learning process beneficial to both the University and the companies it was decided to organize the meeting with HR managers of those companies to specify the exact goals and objectives of the training and to establish the time limits. It was also important to define multimedia technologies necessary to conduct the course.

The next step was to elaborate or select and restructure from the existing ones the whole distance learning complexes which could be included in the curriculum for the training of the employees from those four companies and which could be also used for the future needs. That task was meant to be fulfilled by the University professors constantly working on the distance learning programmes on the basis of the courses they already conduct. Those courses used asynchronous distance learning where a student works independently most of the time. In order to satisfy the needs of companies better the list consisting of ten such courses was sent to the HR managers, so that they could prioritize the ones they thought most useful. As a result five highly rated disciplines were chosen to be included in the curriculum for all four institutions:

- Strategic management
- Qualitative methods of analyses in management
- Knowledge and information management
- Modelling and marketing decisions
- Quality management and control.

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These courses are supposed to constitute the core of most future short-term programmes of the faculty.

In dealing with the particular needs of the companies, e.g. anticorruption management or management of medical institutions, the emphasis was placed on collaboration with prominent specialists in the field who could deliver the necessary information through traditional lectures either in the classroom or online, while difficult matters could be discussed either in seminars or webinars.

This blended learning method proved to be the most advantageous for several other reasons as well, even though asynchronous distance learning may seem more preferable for adult learners who have to combine work, family life and other obligations with their studies. Its flexibility is obvious: students can choose their own pace of learning, elaborating their own schedule of interacting with teachers and fulfilling the tasks. But the experience shows that Russian students have not been properly taught at secondary schools and universities the skills of self-organising their process of learning. The typical Russian classroom environment is teacher-oriented: it is the teacher who coordinates all educational activities – giving and checking tasks, attracting attention to the most difficult parts and even helping to organise team-work while students stay passive. As a consequence lots of students when faced with the necessity to study at a distance cannot cope, and fail without proper direction. So it was agreed that the self-study process should be combined with face-to-face activities when it was possible and emphasis should be placed on interactivity. And although managers of the big companies are usually expected to take control of their learning process including setting goals and leading to self-assessment, student – teacher permanent communication and collaboration with other students proved to be very helpful for the organisation of educational activity. So besides seminars and webinars, certain hours were appointed when students could contact teachers at the University premises and also several tests should be taken by students in class.

The next very important step was to organize quality control and measure students' satisfaction with the content and methods of delivery; this was the phase where the students' involvement was most `natural and desired. In order to get the feedback online questionnaires were sent to the students and possible improvements and adjustments to the learning process were made.

So the whole process of providing educational services in order to upgrade professional skills of companies' employees includes the following main steps:

1. Set the goals and objectives together with potential students (companies).
2. Negotiate the time framework and the number of contact hours.
3. Select the ready-made blocks of courses.
4. Invite the prominent specialists to deliver online and classroom lectures to satisfy the particular needs of the students.

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5. Negotiate the outcomes and define the methods of self-assessment.
6. Define the methods of testing (online/ classroom).
7. Get regular feedback and adjust the programme.

The result of the programme has demonstrated a high degree of student satisfaction and proved that flexible learning approaches can significantly influence this. Most of the students completed their training successfully and confirmed the importance of it both for them and for their companies. Seeing the demand for such services on the market the FDL is working further on elaboration of these short-term educational blocks using the same approach which is though undergoing constant improvement

Conclusion

Students should get more involved in the development of the programme of their studies from the very first planning to the final assessment. Students' satisfaction is the best indicator of the quality of educational services, and the best result can be achieved by collaboration between students and teachers.

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A MOOC TO BREAK THE DIGITAL DIVIDE: IBERVIRTUAL UNED COMA "BASIC DIGITAL COMPETENCES"

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Introduction

The *Open Educational Resources* movement (OER) has shared thousands of online open materials and courses all over the world since 2002. The recent 2012 *Paris OER Declaration*, at the UNESCO *First OER World Congress*, represents its consolidation after ten years of worldwide development (UNESCO, 2012). Maybe more impressive has been the MOOCs movement (*Massive, Online and Open Courses*) over the last year. In 2012, the *Horizon Report* (Johnson, Adams & Cummins, 2012) did not include MOOCs in the most important trends for the future of eLearning, whereas the most recent 2013 report, explicitly says that in just one year we will be able to appreciate their great impact on the education field as a powerful emerging trend:

> *"… interest in MOOCs has evolved at an unprecedented pace, fueled by high profile entrants like Coursera, Udacity, and edX…The pace of development in the MOOC space is so high that it is likely that a number of alternative models will emerge in the coming year " (The New Media Consortium, 2013, p.43)*

In other words, in the forthcoming years, there will be huge offering of this type of courses online, open to anybody, anywhere, at any time, giving thus support to one of the more fundamental millennium goal relating to education: lifelong training (Lisbon European Council, 2000).

However, due to the digital divide, thousands of people still lack the most basic digital competences to take advantage of this training offer, even though many international organizations point up that these skills are essential in the 21st century. In this sense, the European Commission includes the Digital Competence as one of the 8 key competences for lifelong learning in this century (European Parliament and the Council, 2006, p.5).

In order to help overcoming the digital gap, and giving response to the European Commission demand for increased opportunities of training in digital competence, a MOOC on Basic Digital Competences will be offered in 2013, starting in February, by UNED (National

Distance Education University, http://www.uned.es) of Spain, UAPA (Open University for Adults, http://www.uapa.edu.do) of the Dominican Republic and CSEV (Centre for Virtual Education, http://www.csev.org) of Spain.

This course has been designed and developed within the framework for action of the Ibervirtual/AIESAD Project (http://ibervirtual.org). The main objective of this project, created in 2010 and included in the XX Ibero-American Summit of Heads of State and Government, is to promote social inclusion by strengthening distance education in Ibero-American countries. One of its main lines of work focuses on developing skills for Distance Education and, including both basic digital competences for teachers and students and for the general public.

The main objective of this first MOOC represents an innovative proposal that aims to provide the basic digital skills that are necessary to access the opportunities offered by the Knowledge Society and, in particular, to benefit from the new global movement based on social and open learning.

Also, it aims to promote MOOC development in Ibero-American countries, taking into account that the recent Horizon report on Technologies in Ibero-American Tertiary Education, 2012-2017, places the use of MOOCs in a three to four-year time horizon (Durall, Gros, Maina, Johnson & Adams, 2012), whereas a one-year time horizon is expected for other parts of the world. This fact is mentioned in the 2013 Horizon shortlist report:

> *"The Centro Superior para la Enseñanza Virtual is encouraging MOOC enrollment to Latin American communities through a Spanish platform called unX: go.nmc.org/gyorb" (The New Media Consortium, 2013, p.4).*

Design and development of the course "Ibervirtual COMA: Basic Digital Competences"

This MOOC, or COMA in Spanish ("*curso en línea masivo y abierto*"), has been designed taking into account the definition of Digital Competence by the European Parliament:

> *"the confident and critical use of the Technology Information Society and Knowledge for work, leisure and communication. It is based on basic ICT skills: use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet" (European Parliament and the Council, 2006, p.5).*

Ferrari (2012) proposes 7 main areas for The Digital Competence (Figure 1), proposal that has guided this course design.

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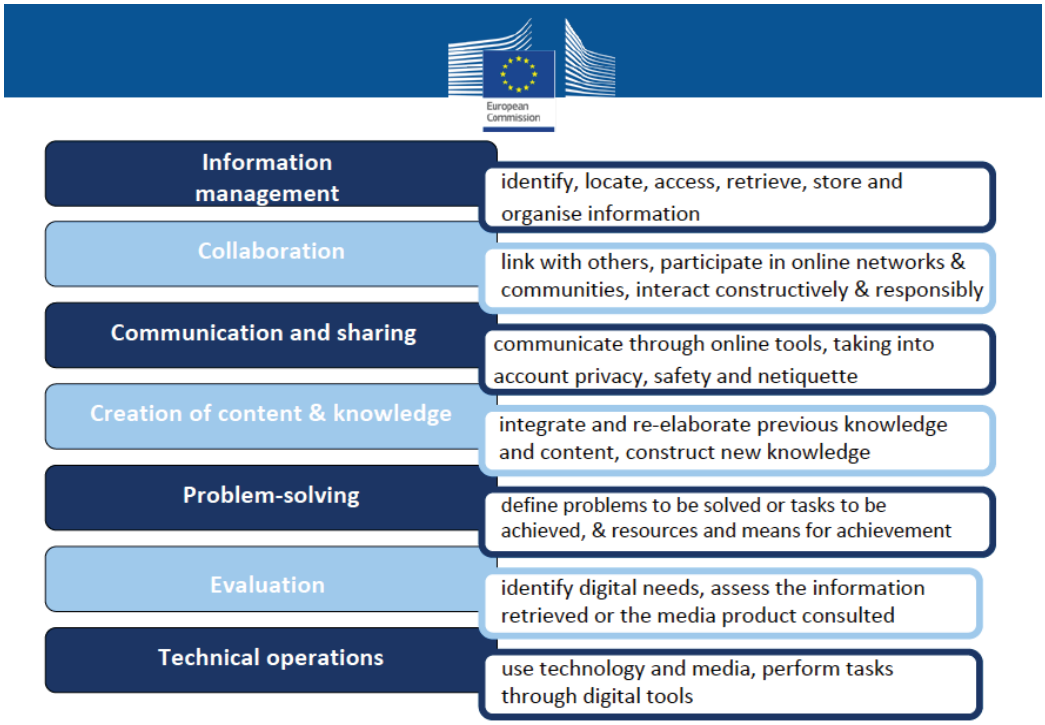

Figure 1. Areas or skills included in the Digital Competence
(source: European Commission, Ferrari, 2012, p.6)

A team of 12 experts in each main area has undertaken the design of the course structure, contents, activities and assessment. It has been conceived as a MOOC in terms of structure and methodology, based on active, participatory learning, mentoring and peer support for guidance purposes, where content delivery and assessment are supported by videos, readings, quizzes and P2P tools.

Its main structure includes the following modules:

- **Module 0**: Presentation of the course and a brief introduction about what Digital Competence is, and main keys to success in a MOOC.
- **Module 1**: Getting used to the course environment, reviewing platform e-learning functionalities and main features.
- **Module 2**: Basic technological skills in digital environments I: the computer (hardware and software) and basic production of documents such as written documents, spreadsheets, and presentations.
- **Module 3**: Basic technological skills in digital environments II: basic uses of the Internet. Guidelines for the use of the Internet, the concept of browsers and web pages, the concept of cloud and web 2.0 and e-mail.
- **Module 4**: Information Literacy in online environments. Management of searching and information storage tools in the network, as well as ethical use.
- **Module 5**: Communication skills in online environments. Types of digital content for content creation and dissemination thereof, legal uses and basic asynchronous and synchronous communication tools.

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- **Module 6**: Social networks and collaborative work. Social Learning and major social networks: use and protection, digital identity and tools for collaborative work.
- **Module 7**: New proposals for massive online learning. What MOOCs, open educational resources, online learning communities or Crowded Learning are; types of educational platforms.

Each module offers a wide diversity of video contents as well as complementary documents and hyperlinks. Some of them respond to preliminary explanations and others to video tutorials, recorded both in studio and by teachers on their own: TV, polymedia and screencast recordings, all of them open in YouTube (Figure 2).

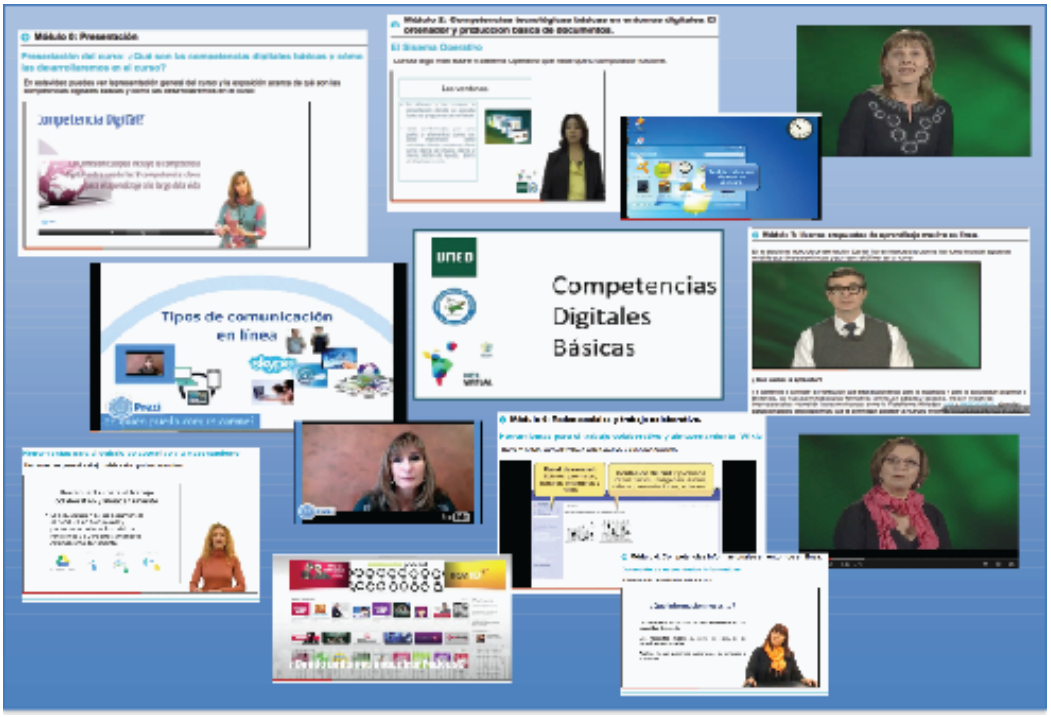

Figure 2. Types of multimedia contents on Ibervirtual UNED COMA: Basic Digital Competences

The course is equivalent to 3 ECTS or 75 learning hours, leading to the award of badges and a final diploma after the course completion.

More than 1000 participants have registered in the first call made through Universia MiríadaX MOOC platform (Figure 3). New calls will take place during 2013, both on UnX and UNED COMA online platforms.

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Figure 3. Home page of Ibervirtual UNED COMA: Basic Digital Competences in MiriadaX (Universia platform, http://miriadax.net/web/comp_dig_basicas)

Final data and main results about this first experience will be showed during the presentation of the work. This first course will be developed from February till April 2013.

Conclusions

We would like to finish, first with some words of caution as referred in the 2013 Horizon report:

> *"massively open online courses are compelling, but universities must critically evaluate their use… However, they have been criticized for low completion rates and low engagement with the instructor, in addition to insufficient forms of assessment. There is an opportunity for educators to examine how universities can integrate MOOCs to support their existing courses and programs and create new ones, while carefully determining the audiences that are likely to benefit most. (The New Media Consortium, 2013, p.18)*

Secondly with some words oh hope. With the course *Ibervirtual UNED COMA: Basic Digital Competences* we expect to contribute to help breaking the digital divide and to improve social inclusion through the development of the skills required to be able to participate in the Knowledge Society, also taking advantage of the large training offer based on online methodologies, such as MOOCs. One of the main fields for testing the efficacy of this MOOC will be Ibero-American countries, as a part of the Ibervirtual project.

First results will be available by April 2013, after the completion of the first edition of this course. We hope to be able by then to give some responses to MOOCs current questions, inquiries and challenges.

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LEARNERS GENERATED CONTENT AND OPENNESS OF EDUCATIONAL PRACTICES: QUALITY OF ELEARNING AS JOINT VENTURE

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Abstract

The quality of education requires reflection and deep understanding of complex contextual elements, interactions and relational dimensions that are essential and often invisible to traditional assessment tools. In the most recent perspectives, participatory and reflective approaches to the evaluation of quality are gaining terrain. Above all, the importance is given to a multivoiced, complex understanding of quality (Ghislandi & Raffaghelli, 2012a) We introduce in this poster a design-based research experience in the context of Higher Education, where the authors attempt to show how two elements introduced in the educational process became crucial to enact teachers and students' reflection and collaboration on quality. The first element was the opportunity to opening (partially) the eLearning course, particularly regarding learners' generated content, in order to achieve quality through the transparency and visibility of educational practices; the second element was a participatory/constructivist evaluation supporting the quality of an eLearning experience from the point of view of the learner. The poster introduces the pedagogical approach as well as the methodology to analyse results, being collected. Finally, we briefly reflect about the importance of the students' voice, both in the process as well as in the products of educational processes, to boost the quality of eLearning in Higher Education.

Introduction: quality of elearning in higher education

The debate about educational quality attempts to move from quality assurance of a product (the lesson, an educational resource, a learning environment) delivered from a producer to a consumer, where the quality strategies ensure a certain product that is recognized as of quality for it follows top-down elaborated criteria ; to a quality strategies, or a continuing monitoring and negotiation of values and practices supporting a quality culture, where the participation and co-production are important conditions for adaptation to participants complex organizational cultures and biographies (educational processes in context). So the quality is not an intrinsic, universal value, but it is mainly about the methodology of evaluation and the substantial epistemological principles and values underlying the process of evaluation

(UNESCO, 2005). In the specific case of Higher Education and particularly of eLearning, the debate about quality considers in fact several levels and areas of the educational process, like is the case of the Sloan-C framework from U.S, which defines quality as a synergy of five elements or "pillars", i.e., *learning effectiveness, cost effectiveness, access, faculty satisfaction and student satisfaction* (Lorenzo & Moore, 2002). Consistently, in the European approach, quality is considered through the different values and perspectives (producers/deliverers/users of education), and the different levels of the educational process (Ehlers, 2004). Furthermore, the trends of research in this group emphasize the notion of quality as a participatory process where the learners/users vision is fundamental. The perspective of the user generated content quality framework stresses the idea of quality as part of dialogue and participation within an organizational learning process (EFQUEL, 2007) (Ehlers, Helmstedt & Bijnens, 2011) that support the generation of a "quality culture" and of "peer reviewed" quality (Auvinen & Ehlers, 2007).

As a result of this debate, Quality cannot be considered as universal fact, but as a *multiperspective, multilevel and contextualized* process (Ehlers, 2009); (Ghislandi, Pedroni, Pellegrini & Franceschini, 2008).

Taking into account these developments the role of students has been considered crucial to define Quality (Ehlers, 2004, op.cit.). Le Preau – quoted in (Ehlers, 2007) – pointed out that stakeholders are quality experts, and that quality can only be defined through taking into account their point of view. In spite of these advancements in educational research, the quality of eLearning in Higher Education seems to be linked to institutional traditions, as cultural factor associated to the tensions and contradictions of eLearning as valuable practice (Bates & Sangrà, 2011) (Ghislandi & Raffaghelli, 2012). In the specific case of teachers' perspective, according to Stockman (Stockman, 2012), the teachers' beliefs regarding what is *good* teaching and what is *good* to teach is changing following the pace of technological change. Teachers' are able of understand the new learners needs, linked to the new ways of communicating and learning, as well as with a changing socio-cultural context. Yet, real practices are still far from ideals, and questioning the role of the teacher (and traditional teaching) as central actor in the academic learning culture "*solicits review of the entire system*" (Stockman, 2012, p.44). The result is the rather difficult implementation of learner centred approaches in Higher Education (Ehlers, 2004). For example, in U.S. Higher Education, the term "student engagement" is connected to the quality of education via the annual National Survey of Student Engagement (NSSE); the annual 2012 results indicate, that engagement in high-impact practices, particularly doing research with faculty and service-learning, was positively related to deep approaches to learning. The NSSE survey results indicate a positive trend in the students' engagement, but there is still a long way to go: data was not so encouraging with participants surveyed from 75 institutions and more than 1000 courses, where near the 50 % "*frequently ask questions in class or contribute to class discussion*"; and "*about half of nursing faculty discussed grades or assignments with more than half of their students, while 42 % of English and only 23 % of engineering faculty did so*". In the Italian case, no similar data has

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collected, and partial analysis of National surveys (like ALMALAUREA, http://www.almalaurea.it/ make possible to hypothesize a rather low students' participation. In this context, the challenge seems to be the engagement of students in the quality culture. Our aim in this paper is, in fact, to show an approach to the quality of education that is based on the development of learning processes and skills supporting students as *joint ventures* in the search for quality. In fact, we consider that giving the space for reflection on quality, as well as a *sense* to the process of engagement, can be factors to improve the *quality literacy*, or the competence to become active participant, *insider* of educational quality (Ehlers, 2007). Our goal is to overcome the vision of students as just respondents to quality questionnaires; searching for more than their "satisfaction", as external "consumers" of quality. The idea of *insiders* of quality regards their potential to build approaches to quality within the institutional context, by supporting the institution and the teacher to improve continuously the educational service and products, as part of the students learning process, and probably as crucial transversal competence for lifelong learning.

Opening educational practices and the learners generated content: an opportunity to reflect about quality

The potential of the concept of OER (UNESCO, 2002) was originally connected to access and quality education for all. From then on, the use of OER has been considered a valid strategy in order to renew educational practices (OECD, 2007; Conole, 2012), on the basis of the discussion about learner centred approaches supported by access to free knowledge, beyond curriculum (Lemke, 1994; Seely Brown & Adler, 2008). In fact, after the conceptualization proposed by UNESCO, several experiences and systematic approaches emerged about the use and sharing of OER (Van Assche, et al., 2009; Conole, op.cit, p. 225-243). Since OER can be used and reused by teachers and learners in a range of contexts (formal, non-formal and informal learning); in the form of self-guided individual learning or collaborative, problem-driven learning, the concept of OEP (Open Educational Practices) has emerged as extension of the discussion about *openness* of education in the recent past. (Elhers, 2011). Open Educational Practices are based on *access* to the extensive available resources, but attempt to go beyond, towards institutional strategies to use and re-use content. In this sense, Learners' generated content can be a part of Open Educational Practices: if academics decide to open their own contents, the students can versioning and integrate the own production as part of a final product that can be further used by new students, in a recursive cycle of practice (Pérez-Mateo, Maina, Guitert & Romero, 2011). We would like to build on this idea, considering that the *openness of educational practices* can motivate students *to learn and participate* on the whole process of quality, (even the dissemination and re-use of the digital contents they produce) becoming *insiders* of the Quality Culture.

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Methodological Approach

Having conceptualized our approach to quality of eLearning, we attempted to intervene from one of the perspectives of analysis of quality: the students. Furthermore, we focused the level of intervention of the *course quality*. Our guiding research question was: How can learners become *insiders,* active *builders of quality*?

The study was conducted in the context of a national research project (PRIN 2009-Italy[1]), denominated "Evaluation for the improvement of educational contexts. A research involving University and local communities in the participatory development of innovative assessment models". The above mentioned project is established with the cooperation of six Italian universities (Verona, Milan Catholic University of Sacred Heart, Trent, Milano-Bicocca, Pavia). The project aims at rethinking evaluation to improve quality through socio-constructivist approaches (Mortari, Bondioli Bettinelli, Ghislandi, Riva & Viganó, 2009). In this context, the University of Trent unit devotes the energies to analyze how quality of eLearning is introduced in the changing institutional context of higher education.

Design Based Research

We adopted in our study the method of DBR-*Design Based Research*. DBR (Design Based Research), consists of experimental educational situations designed by educators and researchers, in order to:

- *Address theoretical questions* about the nature of learning in context. In our case, the theoretical question regarded the development of quality literacy and the motivation generated among students by their participation in open educational practices through *learner generated content*.
- *Studying learning phenomena in the real world rather than in the laboratory*, in order to go beyond the narrow measures of learning and to derive research findings from formative evaluation. In our case, an open educational practice to improve the quality of eLearning couldn't be implemented in a laboratory; therefore, a transformative intervention was designed in order to implement experimental situations and activities, and the students process of participation and results was monitored/analyzed.

Specifically, the design experiment consisted on the implementation of a participatory evaluation for learning generated content at the course IATI13 (Artificial Intelligence and Information Technologies 2013), an undergraduate course within the first Bologna cycle degree of "Psychology". The LGC was hence produced and selected by the same students, emphasizing the idea of "opening" the course at the end of the process; the 3 best works generated by learners, would be part of the next course (IATI2014).

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The course, which workload is 8 ECTS[2], is implemented as "blended" learning. The course is divided into 3 main modules, as showed in Table 1. Among the documented goals, expressed also by the academic in charge of the course in the online forum, there are not only achieving knowledge on the topic, but also, to develop transversal competences crucial both for their future professional profile as well as for lifelong learning.

The students (n:183) were invited to participate to the experimental situation, but not obliged to follow the activities. The experimental activity was presented during the first classroom lesson, explaining to the students in a short and simplified way the policy context, the research background, the goals and characteristics of the activity. Informed consent was distributed and signed by all students.

With regard to the research team, it was composed by the same teacher and main researcher, committed with the changes applied to the own class and the whole process of re-design; and the assistant researcher, who operated in the creative process discussing and generating mediating artifacts, and tightly following the students concerns and requests during the process of implementation of the participatory evaluation.

Data analysis, based on a qualitative approach to research in online learning environments, is now ongoing. The focus of data analysis is:

1. Level of participation, based on Number of students having participated voluntarily on the total number of students.
2. Collaboration for the definition of criteria of evaluation, based on intertextuality and discursive interactions in the online forum.
3. Consistency of responses during the evaluation phase with the original criteria of evaluation, based on the discourse analysis of evaluation forms. Students' impressions about their meta-learning through the participatory evaluation, based on answers to direct questions (interview/questionnaires)

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Table 1: The Course "IATI13" where the experimental activity designed took place

Module	**Description / Learning Goals**	**Mode of Delivery**	**Students' Activities and Outputs**	**Experimental Activity: LGC & Openness for Q**
M0	Course Presentation Understanding the Course structure, rationale, and activities	Face-to-Face (FTF)	Attending the lesson and starting the study of the topic	Understanding the experimentation. What's openness in HigherEd? What's LGC? Can learners contribute to OER movement? Can learners contribute to Q?
M1	Networked Learning Achieving the basic skills to participate in networked learning activities (collaborative distance learning and digital content production).	FTF 2 CFU	Organization of a working group Denomination of the group First navigation on the eLearning platform (Moodle) Initial elaboration of a wiki Video-presentation.	Generation of quality criteria for the elaboration of assignments (LGC) as open content integrating a future OER. Quality criteria as the base for the peer-evaluation of Assignments.
M2	"Talking Brains" Discussing and understanding 6 fundamental thinkers in the field of Artificial Intelligence.	ONLINE 3 CFU	The students must discuss, in collaborative groups one author per week through a collaborative approach where every student has an assigned role. The discussion must lead to the collaborative elaboration of an assignment, that is to be integrated to the wiki (final collaborative LGC) Finally, the students must select one author and make a presentation followed by discussion.	Implementing peer evaluation Selection of 3 best assignments that will integrate a future OER produced by the teacher on the bases of the course.
M3	Advances on AI Understanding the developments of AI in terms of technological innovation and research.	F2F 3CFU	The students attend to the lessons There is a final examination on the topic (multiple choice). The students can participate in the elaboration of questions that will be adopted in the exam.	Good questions (LGC) are part of future editions of the course. The 3 best assignments are presented to all students Questionnaire on impact of the experience.

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Results & conclusions

The preliminary results allow confirming high levels of engagement and collaboration between students, as well as consistent patterns of participation; the kernel of the motivation is generally given by the students' *awareness* on the *openness* (which means transparency and visibility). This form of participation is connected with the engagement of students into the *quality culture* beyond the specific contents they should learn.

In fact, the process of participatory evaluation of Learners Generated Content has been transformed into the occasion for reflection on the quality of the eLearning experience.

Deepening on these assumptions, our preliminary results, obtained from thick descriptions of the students' interactions and comments during the process of learning generated content, as well as the participatory evaluation should shed new light on the process of cultivating *quality literacy* within eLearning.

Of course our approach works mostly in what Ehlers have denominated the *potential quality* which is to say, ground for a final outcome of quality. As this author claims, *a comprehensive empirical validation of the described concepts has so far not been undertaken. Therefore we suggest empirical research questions …"* (Ehlers, 2007, pp.106-107) Our effort has been in fact put on the implementation of an approach based on openness and participation, from one perspective: the one of students in a *joint venture* towards quality of eLearning in Higher Education.

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[1] Progetti di Ricerca di Rilevante Interesse Nazionale, Ministero dell'Universitá, l'Istruzione e la Ricerca, Projects of National Relevance, Ministry of University, Education and Research of Italian Republic.
[2] The credits are counted as "University credits" that correspond with National regulations; however, due to the Bologna process, the credits can be considered as ECTS (European Credits Transfer System) that refer to the following division of students' activity: 1 ECTS is composed by 7-10 hours of "guided" learning, with the presence of the teacher; and 18-15 hours of personal study).

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PLAYING DIRECTOR: THE CONSTRUCTION OF DOCUMENTARIES AS A WAY OF A TEACHING/LEARNING METHOD

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Introduction

In Brazil, the Administration course is designed around three subjects: basics, vocational training, and its technologies. Basic training includes anthropology, politics, sociology, philosophy, psychology, ethics, human behaviour, economics, accounting, communication and information technologies, and legal sciences. The sociology course deals with the creation of the Brazilian society and seeks to explore the aspects of culture, control, social stratification, rationality and power, and the studies of the classical sociologists (Marx, Weber, Durkheim, Comte, and Tocqueville) all in the context of organization and work processes.

Since it includes a plethora of theoretical content, the students find it difficult to assimilate the subject with the actual practice of Administration, making it necessary to seek new tools to assist in the relationship between the theory and its application. This text presents the experience of the construction of documentaries about the books related to the content incorporated in the theme of the undergraduate Administration course of the "Fluminense Federal University" for students in the 2nd semester.

Film in the classroom: fun and learning

In search for tools that contribute in the classroom, several teachers have been using movies to illustrate what is seen in books using practical examples. According to Champoux (1999), movies can be used as case studies, experiential exercises, management metaphors, while exploring the symbolic aspects, and can also be very useful in history-graphical approaches.

The use of different means of communication allows the presentation of a symbolic universe, based on the visual experience that causes different cognitive processes and that facilitates the learning process (Champoux, 1999). In this sense, pieces such as (Billsberry, Gilbert, 2008; Bumpus, 2005; Mallinger & Rossy, 2003; Champoux, 1999) use movies as a means of support to discuss and facilitate the understanding of the concepts presented in the classroom.

For Mallinger and Rossly (2003), movies are a rich resource for studying the culture because they allow different levels of communication. The movie tells the characters' story, their

hopes, challenges, and obstacles, showing how the relationship is formed with others and what demeanours are recognized and socially acceptable and which are viewed negatively and should therefore, be punished. Although all movies represent cultural worlds, some demonstrate specific aspects in greater detail, which facilitates its use as a teaching resource and limits the number of possibilities of concepts to be explored. Hassard and Holliday (1998) highlight that movies offer a more dramatic appeal, representations that are more intense and more dynamic in the organization than texts.

Open Educational Resources

In 2002, UNESCO defined the term Open Educational Resources (OER) as having open access to all educational material, with a diverse community of users that allows the access without commercial purposes. (UNESCO, 2012) This material can be used and reused for teaching, learning, and research.

"REA" can be considered as courses and curricula, teaching modules, student handbooks, books, research articles, videos, podcasts, assessment tools, interactive materials, databases, software, applications, and any other educational material designed for the use of teaching and learning.

In this sense, the search for additional content to complement the classes, leads the teacher to reflect on how to productively use materials that are accessible to students and how to make it seem more attractive than the traditional texts, but on the other hand, how to produce and disseminate materials that show, just from a look, the content of the subject and its practical use.

From spectator to director

The first experience that made use of movies in a sociology course was the project with the movie "Mauá: the emperor and the king" associating it with the book "Roots of Brazil," from "Sérgio Buarque" from the Netherlands, reported in the article, "Teaching Sociology from Roots of Brazil: a dialogue between a classic book and a historical drama film." Inspired by the success of the experience in the use of movies in the course, the teacher brought it to the classroom, a challenge of taking students away from being spectators so as to create their own videos about the content of the course. It was then created, as part of the course, the project "Literature and Management Workshop: discussions about the organizational culture," which replaces the traditional cases used in the teaching of Administration by creating videos, and involving the student with the subject using media tools that are present in his/her daily routine. The idea was to bring the students closer to the main topics of the course. Thus, the students were induced to think in a way that goes beyond the overly fragmented models, simplified or overly complex, those often appear in books, and they were challenged to create content with their own ideas and interpretations.

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To carry out the activity, 44 students were divided into 14 groups and they created the activities of the project as described below:

- **Step 1, Preparation**: three forms were created that paralleled the development of the project. It described the chosen activity, the summary of the activity, and the theoretical content relating to the video's proposal. It also described the stages in the development of the video, the editing and recording stage, and the search for audio-visual material. These forms allowed the activities to be monitored throughout the semester.
- **Step 2, Book selection**: In order for the project to have the necessary theoretical background for the development of the videos, 18 books relating to the Brazilian culture and organization theme were nominated and a space opened up for which the students nominated activities to carry out in the project, as long as they presented an argument about the relevance of the activity for the contextualization of the content in the course, promoting more integration between students and the proposed activity.
- **Step 3, Theoretical groundwork**: Each group of students should read the entire book and adapt to the main concepts and ideas presented. After the reading, they filled out the form that showed the structure of the documentary. It also became known, the type of audio, the images used and how each point relevant to the book could be portrayed to fit the practice and the content. The completion of the forms took part, not only in the control of the process of the creation phase, but also in a moment of reflection and rise of ideas and correlations with the development of the course.
- **Step 4, Elaboration of the mini documentary**: In this step, the groups produced the video. Open content from the Internet was used, such as images, reports and film excerpts, new resources were also created from adaptations and their own recordings. The ideas and the content are beginning to create form and the presentations are beginning to assemble.
- **Step 5, Presentation and assessment**: In the last two classes of the semester, the videos were presented and evaluated by their peers. The evaluation was done by the teacher, by the students, and by the observers who received a questionnaire before the beginning of each presentation. The questionnaire was in a Likert scale (1-5), of "Strongly agree" to "Strongly disagree" and from the scale of these claims, the instrument assessed the quality of the image and sound, of the clear relationship between the video and book content with the subject and clarity of ideas presented.
- **Step 6, Construction of the "OER" and the disclosure**: In the context of the Open Educational Resources (OER) a Youtube channel was created called, "Sociology UFF" with the intention of combining all of the presentations and create an environment that would enable access to this material, which contains not only a practical approach to the content, but also an approach from the student's perspective. The channel was also used as a tool for presentation.

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The books and videos are listed in Table 1, below.

Table 1: Books that have inspired the videos

Books	**Videos**
1808 (Laurentino Gomes)	http://youtu.be/LzxzFu0-O8U
1822 (Laurentino Gomes)	http://youtu.be/1zrH5gIUlNo
"The Mind of the Brazilian" (Alberto Almeida)	http://youtu.be/cGeak8iHgXk
"The Brazilian Middle Class" (Amaury Souza; Bolivar Lamounier)	http://youtu.be/fa-CC1Z9o7g
"The Discovery of the World" (Clarice Lispector)	http://youtu.be/Zal9GvQj_Z4
"The Economy in 'Machado de Assis'" (Gustavo Franco)	http://youtu.be/Te_9uCBcJ-k
"The Girl from the Valley" (Bel Pesce)	http://youtu.be/p8cG1O-9u0E
"The Brazilian Saga" (Mirian Leitão)	http://youtu.be/ErEsrwSrXo8
"The Brazilian Urbanization" (Milton Santos)	http://youtu.be/H9Ya3YUvp9s
"Brazil: Roots of Tardiness" (Fabio Giambiag)	http://youtu.be/UdGRZa7Gkxw
"Formation of Contemporary Brazil" (Caio Prado Júnior)	http://youtu.be/csjpLO_LXg8
"History of Brazil with Entrepreneurs" (Jorge Caldeira)	http://youtu.be/z2_6oFl2WPo
"Pioneers and Entrepreneurs" – v. 1	http://youtu.be/1QWlQ0pr9fo
"Rio – A Watershed Moment" (Urani e Giabiamgi)	http://youtu.be/wtnYKaMrrYY

Lessons from the experience

The realization of this activity was very enriching for the teacher and the students. The project was assessed very well, having critical point aspects related to the picture and sound quality, but all with great relationships between the course and the book.

The monitoring of the activities showed a crucial step of a good result in order to ensure the progress and completion of deadlines for the presentation, and the quality they wished for the sound and picture. Since nobody had the authority to use the tools for video editing, and cohesion between the ideas and the implementation of the content was very important so as to allow the use of the material with future classes of the course.

The project helped in the understanding of the content of the course and in the production of the content for the upcoming classes, which will now be able to have access to the material on the Internet. With this resource, it was possible to go beyond the universe of information traditionally used in classrooms and showed students how to observe and experience a new world of representations, where the opportunities were much richer. Also noted, the project with the videos cannot be separated from the goals of the course; they were closely monitored throughout the semester and in the evolution of the readings.

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PROMOTING PERSISTENCE IN ONLINE CALCULUS: A DESIGN-BASED RESEARCH STUDY

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Introduction

High attrition and failure rates (Smith & Ferguson, 2005) in first year calculus courses at the postsecondary level have been attributed to poor preparation at the secondary school level by some authors (cite). Other authors have suggested that student attitudes and behaviours are at fault (e.g. poor study habits), still others that educational policy changes in the certain jurisdictions allow students to graduate with fewer credits in mathematics (cite), and that there is too much emphasis placed on examination results to the detriment of skills development (Hourigan & O'Donoghue, 2007). Approaches to addressing the mathematical literacy and proficiencies of undergraduate students are as diverse as the cited causes of those problems (Duncan & Dick, 2000). This paper examines the published literature on problems relating to student retention and achievement in undergraduate mathematics courses at the postsecondary level, mathematics pedagogy specifically in the area of calculus, open educational solutions to mathematical literacy, and technologies that have been used to improve the learning opportunities in online mathematics courses. Research on these subjects helped inform a design-based research project such as the formulation of the problem, to the solutions arrived at to address these problems. Figure 1 provides a summary of the design-based research process that was used in this study.

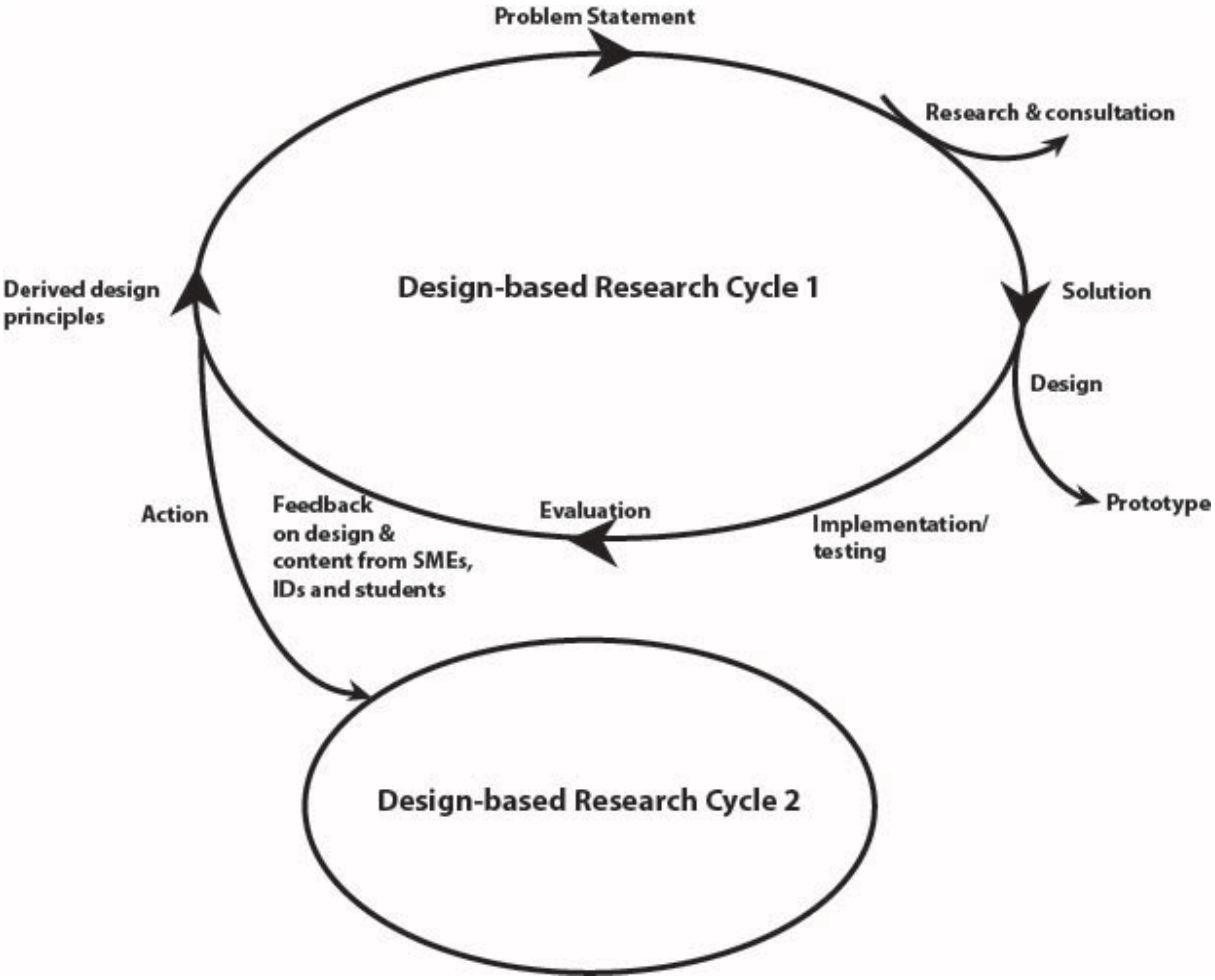

Figure 1. Diagram depicting two cycles of a design-based research process

The problem

Increasingly postsecondary students need to have some background in the mathematics and sciences to succeed in an increasingly competitive and complex work environment. Student success in mathematics often translates into success in business (Hoyles et al., 2002). In the field of distance education it is not possible to predict the level of student preparation given that the student population is quite heterogeneous. Some students are recent graduates, or visiting students from other postsecondary institutions making up a mathematics credit and still others are mature adults who completed their secondary school course work several years prior to their entry into postsecondary schooling. Even traditional postsecondary students may have deficits in their mathematical knowledge as was found in a study conducted by Hourigan and O'Donoghue (2007) on mathematical understanding of graduating Irish secondary school students intending to pursue postsecondary education. Their study found that 31 % of the University of Limerick students who achieved high final grades on graduation from secondary school were still considered 'at-risk' at the postsecondary level. The primary issue with students transitioning from secondary to postsecondary mathematics is that many students have naïve understandings of mathematical concepts that need to be broken down

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and reconstructed once they arrive at postsecondary institutions (Clark & Lovric, 2009; Kajander & Lovric, 2004).

Mathematical pedagogy

Online instructional environments provide a number of challenges for both students and instructors. Students may feel isolated and become disengaged from their host institution leading to a declining commitment to their studies and achievement. Students may be used to a uniform approach to mathematics instruction at the secondary school level and unfamiliar with the variety of personal teaching styles used by instructors in postsecondary education. This paper will explore the different instructional strategies used in postsecondary education and how well these translate to the online environment.

Traditional instructional approaches in mathematics tend not to draw connections between concepts and skills (Hiebert & Carpenter, 1992; Vaiyavutjamai & Clements, 2006). A study by the US National Centre for Research on Teacher Learning (NCRTL) was critical of undergraduate courses that required students to memorize massive amounts of information while paying minimal attention to the meaning or significance of the content that was covered. Some authors suggest that learner-centred instruction in mathematics allows students to become more actively engaged in their learning process and to create their own meaning rather than simply memorizing content (Alsardary & Blumberg, 2009; Engelbrecht, Harding & Du Preez, 2007).

Technology issues

Until recently there were definite limitations to the ability of Internet technologies to support the display of mathematical expressions and facilitate student-student interaction, student-instructor, and student-content interactions particularly in the distance education context (Atan, Suncheleev, Shitan & Bin Mustafa, 2008). The development of MathML, a W3C supported standard, made it possible to place mathematical content in the online environment. While MathML can address issues of mathematics display it cannot address concerns around how to provide effective support to at-risk students in an asynchronous online learning environment (e.g., online self-paced courses). Technologies currently in use to support student learning in mathematics include computer algebra systems (CAS) that serve as computational aids (e.g., Maple), equation editors, graphing calculators, and visualization software (e.g., GeoGebra, Mathematica). Instructors may also be reluctant to use technology because they perceive it as too time consuming to learn (Ellis-Monaghan, 2010). In Software and Internet-based technologies have been used to enhance the learning experience of students in mathematics by improving opportunities for interaction, and providing thinking tools (e.g. visualization tools and graphing calculators).

Computers can act as a window on students' understanding by revealing their knowledge gaps and mistakes, through formative and summative assessment (Laborde, 2007). Computer-based instruction (CBI) is postulated to provide greater learner autonomy than conventional

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instructional environments because students receive immediate feedback and guidance on their performance from automatically graded assessments. Assessments conducted through computer-based systems may allow students to select the type of steps they enter (worked out answers) in the process of reaching a solution (Beevers & Paterson, 2003). Taylor and Galligan (2006) argue that an effective technology-based pedagogy for adult students in mathematics would include discursive, adaptive, interactive and reflective components.

Proposed solution to student persistence in first year calculus

Evidence from the literature review, Athabasca University statistics on student achievement and retention in first year calculus, funding agency requirements, and discussions with the subject matter expert (SME) led to the decision to develop a set of modules that would provide online just-in-time support to underprepared students currently enrolled in a calculus course. There was some concern expressed by the SME about the potential of the online environment to support learners and provide them with adequate practice opportunities. Specifically there was a bias towards pencil and paper practice. The criteria for modules were the following:

- Must be stand-alone (not customized for display in a server-based software)
- Support just-in-time learning
- Content should be designed in a way that makes it easy for other instructors and instructional designers to re-purpose it
- Use open source software or development tools making it easy for others to modify the content and the authoring tool itself
- Where possible the content should be made accessible

The authoring environment

An investigation into possible authoring environments and approaches to presenting mathematics online was begun in early 2008. Before making a decision about which authoring environment would be used for the project a review of the literature on the following topics was conducted:

- intelligent tutoring systems,
- pedagogical agents,
- equation editors,
- open source development environments, and
- mathematics presentation languages (e.g. LaTeX, MathML and ASCIIMath).

Intelligent tutoring systems are defined as "computer-based instructional systems with models of instructional content that specify what to teach and teaching strategies that specify how to teach" (Murray, 1999). Three different intelligent tutoring systems were included in an environmental scan that was done to help decision makers at Athabasca University (AU) and the Canadian Virtual University determine which system to use to develop content for a set of pre-calculus modules that had been developed by an AU academic.

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These modules were supposed to be:

- open (both the authoring tool and the content),
- standalone (not server based),
- immediate feedback to students,
- allows students to evaluate their understanding of the content,
- supports display of mathematical symbols,
- facilitate just-in-time learning (allow students to work through content at own pace),
- adaptive to learner needs,
- authoring capability,
- prior use in academic environment.

Choice of authoring tool

Although ActiveMath seemed the best solution based on an examination of its features it did not meet one of the main criteria of the project – it was not standalone solution. The development group decided that the CTAT provided the best option for developing standalone, just-in-time learning modules for this project however there was one major stumbling block to its use: the fact that it did not support display of mathematical symbols and expressions except as images. One of the major objectives in the project was to develop a series of modules that could be re-purposed by other educators, so it was important that the content be displayed dynamically through scripting rather than as an image.

The prototype

The Flash programmer developed an authoring tool from the ground up that was inspired by the CTAT (basic layout) but original in its coding. A few different types of question types were developed for use in the exercises, tutorials and assessments: multiple choice, drag and drop, matching. Figure 2 is a screen capture of the authoring tool interface showing the different fields for question input as well as the MathML editor that is used in conjunction with the authoring tool. The output is saved as an xml file. Some experimentation has also been done with embedding video in the learning activities.

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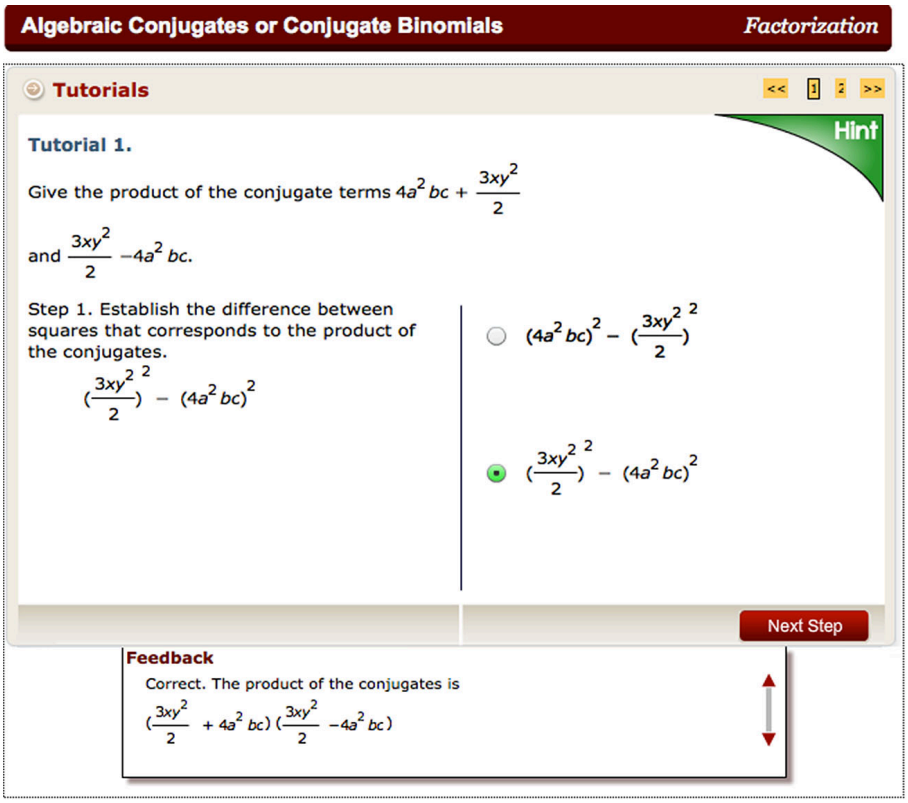

Figure 2. Multiple choice question type in a tutorial displaying feedback

Evaluation

Once the modules were complete they were reviewed by a group of instructional designers and subject matter experts from CVU institutions. The discussion below explores the feedback on the modules that were provided by these two expert groups.

Instructional design review

Instructional designers from CVU institutions were asked to conduct a review a subset of the finalized learning modules. Their comments are summarized in Table 1.

Table 1: Summary of CVU Instructional Designer Comments

Feature	Works Well	Needs Improvement
Feedback & hints	Immediate and provides clear direction to student	Improve quality of feedback in tutorials
Navigation	Easy to navigate	Some confusion about how to navigate within learning activities
Practice opportunities	Provide opportunities for practice and feedback	
Examples	Adequate number	Use Question/Answer format
Learner Support	Technical support adequate	Provide legend to explain specific mathematical symbols
Organization	Modules are well organized	Put answers in Work Out and Check questions in separate file
Assessments		Reduce number of questions in pre-test
Layout & aesthetics	Visually appealing interface	Increase amount of white space in tutorials

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Content reviewers

Table 2 is a summary of the comments that the two content experts made about the content and the usability of the modules.

Table 2: Summary of Content Expert Comments

Feature	Works Well	Needs Improvement
Feedback & hints	Hint feature should work well for students who are struggling	
Ease of use	Easy to navigate	
Learning outcomes	Learning goals are clear	
Instructional content	Topic coverage is average	Content in certain modules need review for accuracy
	Some good ideas on difference and sum of cube in factorization module	Some non-essential content is included in certain modules
	Glossary is good and self-contained	Instructional approach may not be that familiar to students so may impact learning of content
Learner Support		Provide concrete examples to illustrate proofs and theorems
Organization	Material is well organized	Separation of examples from content is problematic
Assessments	Provide both written and multiple choice question types	Include more questions on important concepts like difference and sum of cubes and linear and quadratic equations
	Difficulty level of content is appropriate for most part	

Conclusions

Much of the value of design-based research is that it allows instructors and designers to develop and test educational interventions. In this study a set of principles for online courses in the discipline of mathematics were derived. These principles include:

- need for interactivity (e.g. mathematics editors, tutorials, feedback for students) in online courses,
- the need for visualization of concepts through animations, interactive Flash activities and images,
- the importance of ensuring the accessibility of online content to provide access to students with disabilities and
- importance of using and developing open source tools and open educational content.

The modules developed in the first DBR cycle were shared with other educators by posting them on depositories like WikiEducator, Merlot, and Curriki. In the second cycle of this ongoing DBR project a traditional calculus course was converted into an online format

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(MathML and xhtml) which was delivered in an open source learning management system. The open source software GeoGebra that has active developer and user communities was the tool chosen to develop a series of animations in the second cycle. Additional animations and tutorials were developed using Adobe Flash. Institutional accessibility guidelines based on the World Wide Web Constorium's WCAG guidelines and universal design principles are being applied in the design of mathematics courses (e.g. formatting of tables, skip to content links, use of html headings, MathML). A pilot project using a proprietary mathematics editor and assessment software was undertaken that required that students use the editor to directly enter their assignments (LaTeX and a mathematical palette). The analysis of the results of that project is underway.

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VISIBLE STUDENTS, VISIBLE TEACHERS: GOING BEYOND THE ACCESSIBILITY IN DISTANCE EDUCATION

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Introduction

The title of this paper points to the Hattie's study (2009) "Visible learning" that analyses critical success factors in learning by compiling more than 800 meta-analysis of successful learning. As with any large scale quantitative meta-analysis, of course, there are many methodological caveats. Nevertheless, the key findings of Hattie's study deserve attention and should be discussed in any reflection on what good teaching consists of: Hattie identified the central role teachers play as well as the utmost significance feedback has for students as of high impact on learning achievement.

What are the implications from Hattie's study now for distance education, especially distance education in the higher education sector? Are there any at all? At a first glance, these two educational realms might appear completely separate. At a second glance, however, Hattie's findings can contribute a lot to the refinement of distance education in the higher education realm – at least to distance education that strives to improve the quality of learning and enhancing the student's learner experience.

Distance education has been praised for a long while as it offers flexibility in time and place and thus enhances accessibility of educational offers for students. The increase of accessibility also promotes equity in the educational sector, in the European higher education area this added value of distance education is also discussed in terms of the "social dimension" of the Bologna Process (Leuven-Communique, 2009). With the constant refinement of technologies and their widespread uptake educational designs could also be refined and new affordances be leveraged (for the great variety of educational designs and the issues to be considered cf. e.g. Arnold et al., 2013). Within the European higher education these refinements became even more important when the goals for further implementing the Bologna process till 2020 focused on improving teaching quality and enhancing the student's learning experience (Leuven-Communique, 2009).

However, in addition to the praise of distance education for the raise in accessibility, there also has been put forward a lot of criticism: Academics feel they are losing their "teacher's presence" (Hanson, 2009), perceive themselves as "relegated to the role of knowledge workers whose primary task is to connect students with information" (McMurray, 2001, p.77). Online

teaching sometimes is less valued than classroom teaching. Universities thus often face difficulties in convincing their faculty to teach in distance education programs delivered primarily in online formats (Becker & Jokivirta, 2007; Salmon, 2005). Yet other scholars argue strongly that the increase of online learning might lead to standardization that does not cater for the required cultural diversity and different local practices, especially in fields of social science. They are concerned that content delivered in online formats will lack contextualization and localization and thus seriously reduces learning achievements and the learning experience of students (Askeland & Payne, 2007).

This discussion forms the backdrop of the case study presented in this paper: For 10 years by now, *basa-online,* a degree program of social work, is offered jointly by a network of higher educational institutes across Germany, as distance education in an online format. The program targets a special group of learners: Practitioners in the field of social work who lack a formal degree or training, but who can enrol in the program, study alongside their job in a combination of online modules and face-to-face lessons and can thus obtain a bachelor's degree in social work. The specific challenge of this study program is to carefully take into account the work experience of the students, enable the students to reflect critically on their day-to-day practice, and enrich their practice by applying new theories.

Within the case study, the basic educational outline of the *basa-online* study program is described and its success in increasing accessibility to academic education in the field of social work analyzed. In a second step the refinements introduced recently into the study program to improve the teaching quality and to enrich the student's learning experience, beyond accessibility, are outlined. An exemplary educational design is shared in more detail to flesh out the changes described before. Interestingly, many of the refinements introduced are in line with Hattie's findings on successful learning without having been designed with his findings in mind.

The structure of this paper is as follows: In the next section I will outline Hattie's main findings and the perspectives on learning that have influenced the *basa-online* study program (next section). Subsequently, the basic structure and educational design of *basa-online* will be described and analyzed. Section Four will give an overview on latest refinements and then focus on an educational design that encapsulates the efforts to attain "visible learning" by visible students and visible teachers (to use Hatties's terms again). Conclusions will highlight main insights and bring this paper to a close

Perspectives on learning – A theoretical framework

A 'community of practice' perspective on learning (Lave & Wenger)

Lave and Wenger (1991; Wenger, 1998) developed their social theory of "situated learning" with the key concept of "communities of practice" in contrast to prevailing cognitive learning theories. From a community of practice perspective, knowledge is embedded in social practice and therefore cannot be conveyed in a de-contextualized way, ignoring social relationships

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intertwined with it. Communities of practice that develop, share and refine a specific practice are a key element of learning. More concretely, communities of practice can be described as groups of people that are connected by their passionate engagement in a joint enterprise, by a shared understanding of its purpose and shared artifacts, codes of conduct and rules for interacting (Brown & Gray 1995). Learning from a community of practice perspective is understood as a process of "legitimate peripheral participation". A typical learning trajectory starts for an apprentice (or a newcomer) with peripheral participation and limited responsibility within the community but well supported and acknowledged by the expert community. Gradually, the apprentice's involvement, range of tasks as well as responsibility within the community increases up to full participation. The important master-apprenticeship relation can be partially expanded to the whole expert community.

Taking this stance on learning has several implications for educational designs in distance education: To regard distance education as a quick and efficient format of knowledge delivery is not compatible with a community of practice perspective on learning. In contrast, educational designs created with a situated learning approach strive to create active involvement of students and instructors around a certain domain. They also entail sharing learning products created within the community. Furthermore, online learning in this approach is not focused on the presentation of content with multimedia but on the "legitimate peripheral participation' as process, the master – apprentice relationship, interactions within the community to embed a certain content, and questions of identity. The content of a certain module (domain) is tied back to the actual practice. Assignments often are actual workbench cases where the newly acquired knowledge can be applied, tested and discussed within the community (Arnold, Smith & Trayner, 2012).

A 'critical psychology' perspective on learning (Holzkamp)

Holzkamp (1993) also developed his "critical psychology' theory on learning in sharp contrasts to prevailing conceptions of that time. He argues that the idea that learning occurs where there is teaching is a complete misconception, labelled by him as the "teaching-learning short circuit" (Holzkamp, 2004). According to Holzkamp, learning occurs only if there are *reasons to learn*: "I take the view, however, that intentional, planned learning only occurs if the learning subject himself has reasons to learn' (Holzkamp, 2004, p.29). Where do such "reasons to learn" stem from? Holzkamp (ibid.) elaborates: "Learning always occurs if the subject encounters obstacles or resistance in carrying out his normal activities'.

Holzkamp differentiates further between "expansive learning" and "defensive learning as key concepts". "Expansive learning" occurs if the learner realized a problem in his or her active involvement with the lived-in world and wants to expand his competencies to be able to act in such a problem situation. In contrast to this, "defensive learning" is much more prevailing and occurs whenever I "learn" something just to avoid negative sanctions, either by purely memorizing it or by faking to know things etc. This kind of learning is ineffective; new knowledge, if acquired at all, will be forgotten soon (Holzkamp, 1993; Holzkamp, 2004).

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Following Holzkamp, educational designs for online learning need to allow learners to realize their personal learning reasons. In addition, they need to showcase reasons for active involvement with the domain and to provide options. Resistance and failure in online learning settings can be explored by assessing whether the domain is perhaps not yet tied to a student's reason to learn. So any extra efforts on the teacher's side are better guided into highlighting the actual relevance of a knowledge area, its applications and its implications for the life of the leaner than in multimedia refinement (cf. Zimmer, 2001).

"Visible learning" – Hattie's research findings

In a nutshell, Hattie's (2009) results can be described as follows: Structural factors like school organization or class size are less important than personal factors. Student achievement is not dependant on staggering innovations but rather on thoroughly implementing effective teaching strategies, with a passionate attitude towards students, the domain and teaching itself. But it is not the teacher as a talented person as such but rather what teachers actually *do* that is most influential ("*what teachers do matters*"). According to Hattie (2009, p.243) teachers actions, teaching strategies and attitudes play a key role for students' achievements – "only minimal guidance […] does not work".

Among the most successful teaching strategies feature: clearly structured instruction, clarity as to success criteria and requirements, a broad spectrum of activating teaching methods and challenging tasks for students Equally important is an active, even passionate engagement of the teacher in the teaching process: Teachers that try to establish a positive and encouraging learning atmosphere, i.e. showing genuine interest in each students' learning progress as well as respect and empathy to all students regardless of their actual competencies, have greater impact on students' achievements than those who do not act in this way. Generally, it seems important to create an error-friendly and empowering classroom climate. In addition, formative evaluation as to assessing students' prior knowledge, their learning progress and learning success is important – giving students relevant feedback features high but also the constant monitoring and evaluation of one's own actions as teacher is of crucial importance. In addition to these teaching strategies, material and programs especially for less-achieving students have a great impact.

Hattie's interpretation of the results, favouring "teacher as activator" over "teacher as facilitator" is of great relevance for distance education with online formats. The changing teacher role in distance education and especially in online learning has often described as "from the sage on the stage to the guide at the side". This change might have been mistaken sometimes in not acknowledging the important role such a "guide" has. Re-thinking teacher's roles in online learning from the perspective of Hattie's research results would clearly stress the critical success factor of these online "guides" and assign them an active and decisive role.

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Case study *basa-online I.* – Increasing accessibility to degree programs in social work

The case study is based on participant observation notes, minutes of coordination meetings, planning sessions, the accreditation process, and enrolment statistics due to the authors double involvement in the study program: as lecturer and as program director at one of the participating universities. In addition, results from a research program on study trajectories and study success in Bologna programs (USuS, duration 2009-2012, funded by the German Ministry of Education and Research) were included.

Basic set-up of the distance education program basa-online

The distance education program *basa-online* is a degree program offered jointly by a collective of seven higher education institutions across Germany. It was established by three universities in 2003, with the aim to increase accessibility to academic qualifications, and has been expanding ever since, in numbers of partnered universities as well as in students enrolled. Students registered in this program are a particular student cohort with a great amount of professional experience in the social field: Professionals who have relevant work experience in the realm of social work (at least 1.5 years with at least 50 % of the average agreed upon full-time working time in a field of social work) but lack a formal degree or training may enrol in the program, study alongside their job in a combination of online modules (75 % of the study time) and face-to-face tuition (25 % of the study time) and obtain a bachelor degree in social work in this way.

Face-to-face instruction is organized in regular seminars, taught by faculty, during the week-ends for those subjects that are regarded as especially difficult to be studied in an online format, such as counselling techniques, communication skills etc. Online modules, also taught by faculty members, provide comprehensive study texts elaborated for distance education, enhanced with multimedia elements, presented in a learning management system (OLAT). The online modules are generally taught in a condensed, blocked period of time, between 8-10 weeks. The learning management system serves as the basic technological infrastructure for mainly asynchronous communication and collaboration around the learning content, primarily in a written format. Usually, during a module, students work individually, in pairs, or groups on several tasks that ideally link the content of the module directly with the students' work experience. As an overall design feature in the study program, the work experience of the students is used as a starting point to explore social work theories.

With this set-up contextualization and personalization of the diverse study subjects is aspired to. Work experience related to the subject as well as results from individual or group study efforts are generally shared within the learner community, regarding students' products as additional valuable learning resources. In addition, right from the beginning of establishing the program both a sense of learning community among learners and lecturer as well as amongst learners and personalized feedback was encouraged. In co-ordination meetings and planning sessions with faculty the important role of the lecturers were stressed – giving clear

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instructions as to learning goals and tasks, delivery deadlines etc., choosing challenging tasks, best related to students work experience and facilitating a trustful atmosphere in the online realm. For faculty, teaching these online modules was accounted for with the regular teaching load equivalent that face-to-face teaching can be accounted for with university management.

Critical assessment

As regards the aim of increasing accessibility *basa-online* can be regarded as very successful, straight from the beginning onwards. Drop-out rates are exceptionally low, considering that this study program is offered at a distance (average drop-out rate over all partners and cohorts less than 20 %). As impressive are the number of applicants: even though the number of universities offering the program has more than doubled over the years with student intake number increased even more as some universities start every semester as opposed to the original rhythm of once a year applications constantly outnumber capacities of the program. For Munich University for each study placements there are app. 8 applicants for each enrolment round.

Summarizing, the flexible study format of *basa-online* clearly raises accessibility to academic degree programs and thus contributes to realizing the "social dimension" of the Bologna Process in higher education in Europe.

Apart from this dimension, evaluation results generally also show a high level of student satisfaction with the program (compiled e.g. for the re-accreditation of the program in 2009). Among faculty, basa-online students on average are assessed as highly motivated and high achievers. Results of the research project USuS (including only students of Munich though) rendered a similar picture of above average student satisfaction. However, both the research project as well as the continuous evaluation routine also revealed scope for improvement and refinement (for details cf. Arnold & Kolbinger, 2013).

Case study *basa-online II.* – Refinements beyond accessibility

Directions for refinement

Three main directions to take for the further development of the basic educational set-up of the program were identified:

- *Incorporating live classroom sessions*: Teacher–student interaction as well as student-student interaction can be enriched by live classroom sessions. Video-conferencing systems (e.g. Adobe Connect) allow for synchronous live events that add another modality to the mainly asynchronous written communication within the online modules. Teacher's presence can be fostered as teachers can present a topic, embedding it in their own working context and directly answer students' questions. Students can present their work and share it with the learning community. Teachers can gather formative feedback on the teaching process and easily share it within the group by using in-built instant voting facilities. Live classroom sessions can be easily

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recorded and provided this way to students who could not participate for time collisions.

- *Providing a network archive of videotaped lectures*: At many universities of the network, lectures of guest speakers, inaugural lectures, etc. get video-taped. By building up an archive of these videotaped lectures across the network students can tap into valuable learning resources, in addition to the regular study texts. The program thus will cater better for different learning styles.
- *Enabling e-portfolios*: E-Portfolios are increasingly used for documenting and reflecting on lifelong learning and to develop meta-cognitive learning strategies. In addition, they foster personalisation and visibility of learning as students can showcase their work and receive teacher and peer feedback.

Exemplary educational design: "walking the talk" in adult education

The online module on "adult education" was a module in which some of these refinements were piloted. For the study subject of adult education it seemed particularly adequate to implement measures to enhance "teacher and student visibility" and thus "walk the talk" in adult learning. Table 1 outlines the module's set-up:

Table 6: Basic set-up of online module "adult education"

Time Frame	**Method & Tools (T=teacher activity / S = student activity)**
Module Start	T: Start module with personal learning biography and instructions (Audio-Podcast) T: Provide study text and discussion forums
Week 1 Creating a Landscape of Questions	S: Summarize prior knowledge and experience in adult education & elaborate personally relevant questions T: Welcome students individually into module with pointers to possible relevant content and assignment options
Live Classroom	***T: Clarify questions on content, assignments and procedures***
Week 2-4 A. Reflecting one's own learning biography/ B. Discussion on Questions	S. Reflect on personal learning biography (forum) T: Generic feedback & cross-references to study text T: Structure discussion and prepare additional input according to landscape of questions S: Contribute to written asynchronous discussion
Live Classroom	***T: Deepen and summarize discussion on selected issues***
Week 5-6 Preparing a "Fair" on Adult Education	S. Elaborate a concept for a seminar/workshop within the context of their work T: Provide further resources & answer questions
Week 7-8 "Fair" on Adult Education	S: Present concept & provide feedback on another concept T: Provide generalized open feedback on concepts presented T: Provide personalized feedback and grade
Live Classroom	***T/S: wrapping up module, answering remaining questions, module evaluation***

The set-up focussed on making the teacher's involvement with the topic visible, providing occasions for students to discover their own learning reasons and opportunities for contextualization and participation while at the same time having a clear structure, creating a

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welcoming atmosphere and providing customized additional material and feedback on achievement on authentic tasks.

Critical assessment

Student evaluation data showed high appreciation of the strong teacher-student interaction. Especially the visibility of the teacher's involvement with the topic in a personal way was appreciated, even more so due to the audio introduction that related the teacher's own learning biography to topic. In the same way the thematic conversations in the live classroom were appreciated. The latter helped contextualize the methods and instruments for adult learning discussed. The start seemed to have set a standard of reflexivity and personal involvement that was also reflected in students' reflections on their learning biography. However, due to time constraints only a small number could make the synchronous event (max. 6 students). The recorded versions were appreciated but as they were not refined for non-participants they were reported as tedious to watch. As e-portfolios were part of the module's content it was regretted that e-portfolios were not integrated in this module due to technical problems.

Conclusions

The case study shows that distance education programs can go beyond offering accessibility. With online learning elements, nowadays widely available, but even more so with a well elaborated educational design, an active teacher role, "teachers' presence", is possible in an online environment. The same applies to a warm, welcoming atmosphere and passionate involvement with the topic. In addition, personalization and contextualisation can be realized. However, it requires the same amount of commitment to teach online as it does to teach in a traditional classroom. Minimal guidance and involvement of the teacher just because there is digitized content does not work – to expand Hattie's argument. In order for teachers to commit to online teaching, however, structural factors gain importance: Teaching online needs to be valued like classroom teaching. If distance education programs are introduced merely for cost-efficiency, "visible learning" will seldom occur.

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SUPPORTING DESIGN THINKING AS A BASE FOR ADULTS' EDUCATORS PROFESSIONALISM

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Abstract

Adults education is considered one of the less structured, ill-defined fields in terms of practices and competences that professionals should behold to operate within. This is particularly the case of intergenerational and family learning; the problem of the "private" sphere of learning, as well as the very informal nature of this type of learning requires more research to understand how to shape practices and which skills the educators should have. In this initial phase of our research, we contend that Learning Design, as practice that supports educators in capturing and representing the own (situated) plans of action within educational interventions, can be a key element to develop educators professionalism, towards quality and effectiveness of adults' education. We support this assumption with the introduction of our training approach, where adults' educators are invited to implement a *creative/reflective process* of five stages; every stage introduces tools for representing as part of the Learning Design approach; furthermore, trainers are encouraged to go beyond representing, by sharing and commenting other trainers' designs. According to this approach, two elements of professionalism are promoted: At the level of the single educator, and at the level of the community of adults' educators.

Introduction: adults education, a new frontier of practice

Adults education is a key for our societies. However, it is also considered one of the less structured, ill-defined in terms of practices and competences of the professional operating in the field (Beleid & Plato, 2008a). In some particular areas of adults education, even the fact that the intervention is part of the discipline of education, or falls into the area of health care and social development is object of discussion. The result is highly informal, fluid contexts of learning. For the educator this means that she has to feature the own context of work in every intervention. Instead, other types of professional profiles in education (like teachers at school or academic context, and even vocational educational trainers) work in formal environments, with well-defined tasks and activities (Przybylska, 2008).

The specific case of adults' education to promote creative intergenerational experiences

Intergenerational learning (IL) as well as family learning play a crucial role in the field of adults education, and are one of the clearer examples of the problem introduced in the former paragraph. While it is clear that it improves dialogue between generations through civic participation in common social and institutional spaces, initiating processes of informal learning towards the achievement – both by adults and children – of key competences for lifelong learning; it is also clear that ensuring IL through the creation of adequate educational environments is a challenge both for researchers and practitioners. On one hand, formal education promotes mainly intra-generational experiences, structured in learning contexts where little or no contact between among generations (beyond the technical role of teachers/educators) occurs (Loewen, 1996; Miller et al., 2008). On the other hand, intergenerational learning also implies setting up adequate learning contexts for adults (Newman, 2008). More research is clearly needed in this field, considered frequently part of the "private" space (the case of family learning) or just the cultural, spare time or volunteering space of practices, where no pedagogical approaches are necessary.

However, events like parenting, cultural participation, support to the own kids schooling, social activities, engage adults and have the potential of taking them to reflect on their own condition as lifelong learners, from one side, and as *educators* of the future generations (Margiotta, 2012; Raffaghelli, 2012). This is the assumption of the A.L.I.C.E. project (Adults Learning for Intergenerational Creative Experiences) and main challenge, as evidenced by its aims and objectives (which can also be found at its website: http://www.alice-llp.eu). Accordingly, the need of intervening on adults' educators professionalism was seen from the beginning: professionals with the ability to understand new contexts of learning, and to reinforce the adults' key competences for the lifelong learning society without invading their sense of independence and protagonism in the social spheres of life.

Learning design & design thinking: the kernel for adults' educators professionalism

From the previous paragraphs it emerged that it is impossible to generate an educational project for adults' education without reflecting and planning carefully the phases, the resources, the roles and forms of communication between the trainer and the participant.

The concept of *design* provides us support at this point: like in the field of architecture or engineering, the educators can design their interventions, that is, analysing the context, the available resources, the educational problem and the participant's motivations, in order to orchestrate *educational solutions* based on the theory of learning. These solutions will lead in time to a pedagogical reflection that can end up in further conceptualizations. In fact, there is an emerging field of research and practices in educational sciences: *Learning Design*, that is, a conceptual and methodological approach for educators to explore their educational problems and make more grounded decisions to plan/implement their pedagogical practices (Conole,

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2012). The challenge of Learning Design is representing teaching and learning as an integrated process. Representing is something frequent in other disciplines like music, chemistry, architecture, and so on. Let's take into account the example of music (this example is taken from the Larnaca Declaration on Learning Design: http://www.larnacadeclaration.org): wonderful music could have been lost if it was not for the invention of the system of musical notation. Of course a good system of notation does not make an interpreter excellent, not even good. But a good notation allows to understand the creator's idea, and to pass, from one musician to another, beautiful pieces of art. Learning Design aims at making visible the invisible art of education. Some designs will be more connected to the visual representation of ideas (Botturi & Stubbs, 2008), while others search for patterns and templates that allow the educators to work out the own ideas supported by the inputs given by the schemes for designing (Mor & Craft, 2012). Technologies, it goes without saying, are vastly adopted to support all sorts of representation (Conole, op.cit, 2012).

Why Learning design in Adults Education? As it has been emphasized in the extensive report commissioned by the European Commission, "Key competences for adult learning professionals" (Buiskol, Broek, van Lakerveld, Zarifis & Osborne, 2010), Designing for Adults learning is one of the key competences for professionals operating in this area. In fact, to promote intergenerational/family learning, being this a rather ill structured field of practice, new forms of representation and sharing of adults' educators knowledge could lead to better approaches and educators' skills to manage the problems encountered in the field. Therefore, there would be a joint development of professionalism (the single ability to intervene in a field of knowledge) as well as reflections contributing to the development and impact of adults' education (a consolidated set of practices that support a group of professionals in their ability to deal with specific educational situations). This process is, in our view, based on the effective promotion (through a professional development approach) of *design thinking*. Design thinking is the ability to think about ill-defined problems, acquiring information, analysing knowledge, and hence, designing possible solutions. It can be considered a style of thinking that combines empathy for the context of a problem, creativity in the generation of insights and solutions, and rationality to analyse and fit solutions to the context (Cross, 1982). From one hand, this type of thinking is connected to the own personal taste, creativity and imagination; but from the other, in the field of education it promotes the visibility of practices and the possibility to share them, to promote discussions about the set of values, the approaches and the effectiveness and quality of them (Kali, Goodyear & Markauskaite, 2011).

From concepts to the approach learning design as creative process to support adults' educators professionalism

Design thinking could be connected, in the field of education professionals, with the research undertaken in the specific case of teachers and teaching profession. Teachers' professional identity, and their processes of planning, imagining, and talking about (in informal conversations) their practices in class, has been linked to teaching effectiveness. Later on, the narratives about the own professional activity have been identified as forms of "crystallizing"

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the good and the innovative, to replicate experiences in a continuing process of improvement. In this sense, design thinking could be considered a process of "imagining" the own future practice, but also, of thinking about a creative approach to solutions that can be shared into a set of common professional values. This way, the relationship between *design thinking* and professionalism can be depictured as follows*:*

- At the level of the single educator: The more the educator improve their skills for design thinking, the more she will be able of planning and intervening in ill-structured problems, providing creative educational solutions
- At the level of the community of adults' educators: the more the educator are able of designing for adults learning, the more they can adopt tools to represent, share and discuss the own practices, reinforcing a field of professional practices, which is also part of the adults' educators professional identity. Technologies are a mean in the process of representation and sharing.

The case study

A case study is a methodological approach that aims to deepen the understanding of the developments of a situated phenomenon, seen in its uniqueness and originality, as an "individual unit" (Stake, 1994) or what has been later called a "functioning specific" or "bounded system" (Stake, 2008). The valuable contribution is hence the thickness of descriptions and information obtained regarding the problems posed and the developments of the situation. The boundaries of our case are given by:

- the educational process and strategies to improve adults' education, in the context of the LLP-GRUNDTVIG project "Adults Learning for Intergenerational Creative Experiences", http:// www.alice-llp.eu;
- the transnational and eLearning approach. 6 institutions from IT, RO, UK, EL, CH built a course and an educational environment (on Moodle: http://www.alice-llp.eu/virtualspace) provided the space to reflect about practices and share ideas, during 6 months of implementation.
- A professional learning community composed by 23 adults' educators and a team of 6 adults' education institutions attempting to shape new approaches (Adults Learning Pilot Programmes or ALPPs) to promote the idea of adults as educators as well as the value of creative languages to mediate intergenerational/family learning.

In this setting, we will focus the instruments adopted to promote the educators design thinking, which is composed by five phases. Along these phases, the educators were invited to adopt tools to represent and understand the *creative process.* Table 1 shows this approach through its elements, while Figure 1 represents the process along a timeline.

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Table 1: Promoting design thinking along an educational intervention as creative process: phases and elements

Phase	Description
1. Understanding the context of practice	Objective: to collect information and reflect about the driving forces in the context of educational practice. Tools to represent/think about the design approach: Design Narratives and Force Map (http://www.ld-grid.org/resources/representations-and-languages/). Design thinking to provide solutions for...: The context as changing, fluid space of learning. The enlarged context of learning in the intergenerational case: adults' goals of learning and children/teen goals of learning differ, but can dialogue in an enlarged context of learning.
2. Representing the educational process	Objective: Plan the intervention beyond the procedures, reflecting on the pedagogy. Tools to represent/think about the design approach: The Four Leaves taxonomy and its 4 steps (information, laboratory, assessment/evaluation, personalization) (http://www.slideshare.net/JulianaElisaRaffaghelli/alpp-strategylu6lu7). Design thinking to provide solutions for...: a clear and concise representation as part of the process of Learning Design to allow discussion and peer-reviewing on the quality of approaches before putting them into practice.
3. Implementing practices and networking to improve the educational sustainability	Objective: A process of implementation that is continuously monitored from peers, participants and external stakeholders (institutions engaged in the practice Tools to represent/think about the design approach: Check-lists, mental maps, blog and private trainers' log (http://www.slideshare.net/JulianaElisaRaffaghelli/alpp-strategylu6lu7). Design thinking to provide solutions for...: ability telling a story that makes the whole approach accountable and shareable.
4. Evaluating practices	Objective: A participatory approach to understand learning achievements and the educational impact Tools to represent/think about the design approach: the learning/key competences map (http://www.slideshare.net/JulianaElisaRaffaghelli/alpp-strategylu6lu7). Design thinking to provide solutions for...: understanding effectiveness as part of the educational process.
5. Making the approach transparent: opening practices	Objective: To understand the importance of Open Educational Resources in strengthening the pedagogical and design thinking. Tools to represent/think about the design approach: templates and a virtual platform to shape/upload the own educational work. Design thinking to provide solutions for...: sharing educational practices in search for quality within the educational process.

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Figure 1. The creative process of educational intervention

Analyzing adults' educators professionalism

As we can see the adults educators professionalism is reinforced through a reflective process where representation (from the idea for the educational intervention to the crystallization of practices in an open educational resource) is the kernel, as it is shown in the Figure 2.

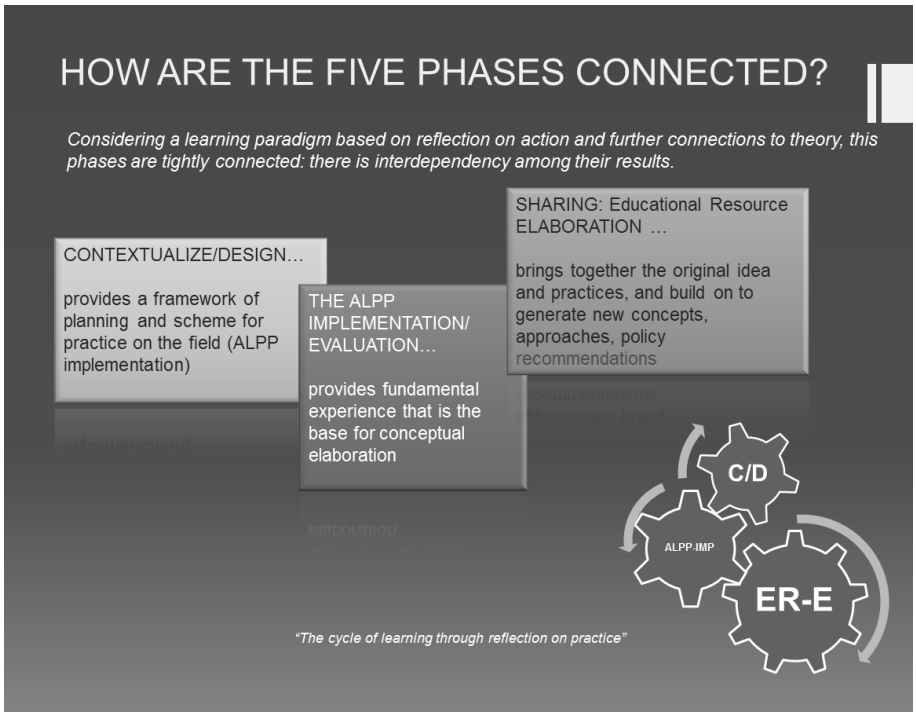

Figure 2. Connections between the phases as part of an approach to professional development

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The analysis of the impact on the own professionalism is undertaken from the beginning of the process, adopting the tools for representation as sources informing the reflective process:

- Trainers' Competences Map as counterpart of the adults Key Competences/Learning Map
- Trainers' Log
- Social media as collectors of evidence on the ongoing practices
- The crystallized practice: an Open Educational Resource within the field of adults education

In the end, educators have all the necessary to make comparisons between the Plan and the results (intra-educational process) as well as to peers' solutions and stages of development/implementation (inter-educational practices).

Conclusions

The quality of adults' educators practices is a challenge, that requires high skills and professionalism, as well as more emphasis on the definition of the areas of intervention of adults' education. The foundational works of Knowles, Freire and Mezirow (Raffaghelli, 2013), which theoretical efforts went into the direction of defining adults' education as field of practice, emphasized the idea of adults' education as conversational practice, based on learners' reflection to transform the own conditions of life; this means that adults decide to learn when there are significant events in significant contexts. Professionalism, or the capacity to react in uncertain situations according to expert patterns of action, should harness the potential of a conversational approach, mainly informal.

In this initial phase of our research, we contend in that Learning Design, as practice that supports educators in capturing and representing the own (situated) plans of action within educational interventions, can be a key element to develop educators professionalism, towards quality and effectiveness of adults' education.

As Conole puts in her work,

> *"[Learning Design] is a methodology for enabling teachers/designers to make a more informed decisions in how they go about designing learning activities and interventions which is pedagogically informed and makes effective use of appropriate resources and technologies. This includes the design of resources and individual learning activities right up to curriculum-level design. As a field of research and development it includes both gathering empirical evidence to understand the design process and the development of a range of learning design resources, tools and activities." (Conole, 2012, p.8)*

In our approach we attempt to develop *design thinking skills,* as the result of exploring forms of capturing and representing plans and practices. The five phases of adopting conceptual and procedural tools, as part of designing for learning, should hint adults' educators in their efforts

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to provide solutions to ill-structured educational problems; this is the individual side of professionalism. However, we go a step beyond, targeting also the process of representation as opportunity to peer-review and learning with impact on professionalism (as field of practice). Lastly, in our approach, technologies (the adoption of *transmedia* to make the own practice accountable and shareable, from the virtual learning environment to the blog and the production of an open educational resource) mediate the whole process of Learning Design. Whether this approach will succeed in tackling the complex issues of the adults educators professionalism, will be the next step of our empirical study.

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NOOA – AN ONLINE INITIATIVE FOR LEARNERS AND COURSE CREATORS

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Nordic Online Academy – NooA, Norway

The **No**rdic **o**nline **A**cademy (NooA) The Nordic Online Academy (NooA) is an initiative which aims at the development of an international mall for online courses. It was started in 2012 and already offers courses in the fields of creative writing, online pedagogy, social media in education, the theory of cooperative freedom and transparency in online learning, among others.

NooA aims at providing the conditions to ensure the development and supply of quality courses and services. An international Advisory Board, an international Quality Board and a Scandinavian Student Commission are perceived as crucial for the quality and success of the initiative.

Brief description

NooA and the "Theory of Cooperative Freedom and Transparency in Online Education"

NooA's idea is based on the Theory of Cooperative Freedom and Transparency in Online Education [1]. In line with Knowles [2], this theory understands adult students as intrinsically motivated, self-directing and with a desire to control their own learning path and outcomes and consequently have a need for freedom in their learning process.

Understanding education as a cooperative rather than an operative activity, NooA's aim is to provide a setting that implies freedom (autonomy and independence) as well as cooperation. Freedom in an online education environment can be achieved in 6 areas, namely time, space, pace, medium, access and content (see Figure 1).

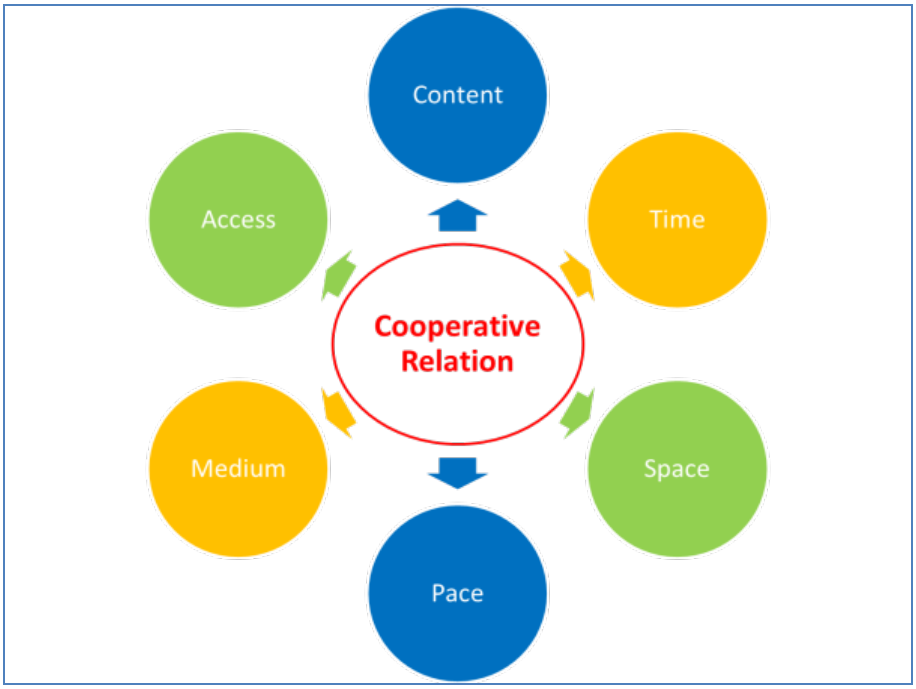

Figure 6. Cooperative Relations

NooA provides flexible access to its courses, course completion within flexible margins and asynchronous communication that offers independence and freedom while learning and interacting with peers and teachers. Access is open to every person who feels capable of achieving the described course goals. There is no restriction based on prior qualifications, gender, race, social class, occupation, etc.

NooA – Mission, values and aims

NooA started in 2012 and was in November officially accredited in Norway as "nettskole" (net school). In December it was already accepted as a member of EDEN (http://www.eden-online.org), NADE (http://www.nade.net), and FLUID (http://www.fluid.dk/forside.aspx). Currently, NooA offers 10 courses and has submitted a grant proposal for the development of 30 courses to VOX (http://www.vox.no).

NooA's main mission consists in providing quality online education that creates sustainable value, public awareness and footprints to follow. NooA's values can be crystallized as: economical, flexible, acknowledging, quality-conscious, transparent, and social.

NooA's principal aim is to become an international Learning Mall for Online Courses. In order to achieve this aim it is developing a multilingual learning community which aims

- to be an attractive partner for individuals, institutions and companies that develop, translate and offer online courses;
- to be acknowledged and accredited in several countries;
- to provide courses at least in English, Portuguese, Spanish, German, French, Danish, Swedish and Norwegian;

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- to provide students with different backgrounds a great flexibility and, at the same time, learning value as a return on investment; and
- to be among the largest Nordic providers of online courses.

NooA aims at providing the conditions that ensure the development and supply of quality courses within the concept of lifelong learning, the development of personal and professional skills and new opportunities for learning in the 21st century.

In order to achieve this mission, NooA has established a powerful support structure that consists of the following elements:

1. The international Advisory Board consisting of experts in areas such as education, environment, art, literature, social awareness, technology and social media.
   The Board consists of members that have special qualifications to pursue NooA's mission and give strategic advice on purposes such as:
   - Which services, subjects, courses and programs NooA could offer to support online learners in general and learners with special needs in particular.
   - Research and development activities that can contribute to the development of NooA, improved online teaching and student support services and general advancement for the benefit for the entire online education sector.
   - How NooA could disseminate research, evaluations and good practice in online education to the benefit of the national and international online education communities.
   - How NooA can use e-learning to support and contribute to social entrepreneurship and humanitarian activities.
   - Any other strategic and ideal purpose that supports NooA's mission.
2. The Quality Board with the mandate of giving support to NooA in assuring, maintaining and developing the quality of NooA's scope, including information on courses and programmes, administration of courses and programmes and student services, course contents, teaching and learning methodology, evaluation of students, and teacher qualifications.
   It's main activities are:
   - to advise NooA in designing and carrying out evaluations related to all projects with national and/or international external funding;
   - to advise NooA in developing and carrying out suitable evaluation of courses and programmes;
   - to contribute to and ensure that NooA administration produces a yearly quality report to the Main Board of NooA; and
   - to advise NooA in developing a suitable quality assurance system.
3. NooA is establishing a Student Commission with six representative participants among NooA's online students. Their mandate is to find an organisation form and an action

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plan to provide advice and suggestions for improved quality for NooA's courses and services.

NooA – The learners perspective

The courses offered via NooA's international learning mall give students access to a good variety of media and sources of information and have the aim to become a repository for a wide range of subject areas that meets the characteristics of adult students in the sense that they are goal oriented, activity oriented and learning oriented [3] and should therefore not be restricted in their choice of content.

Learners can find in NooA's courses the means for personal development and opportunity to be in charge of their learning process. NooA's commitment to freedom of access is visible in a number of characteristics that were stated from the beginning, for example, individual start and progression within a course and 180 days access to the course. NooA wants to provide online education that creates sustainable value, public awareness and footprints to follow. The topics of the courses presented to NooA by course creators have to meet these criteria.

NooA – The course creators perspective

CampusNooA uses as learning management system (LMS) Moodle (https://moodle.org). All the courses must be revised every second year. As an international Learning Mall for Online Courses, NooA assumes English as a required language for both teacher and course developers. CampusNooA provides several meeting spaces such as The Collegium, a forum, where teachers and course developers can discuss the process of designing and moderation of courses online.

It should be pointed out that the free course Certificate for Online Teaching (COT) is a course that must be successfully accomplished by the course developer and teacher. The COT provides hands-on knowledge about how to be a creator, teacher and also student at NooA.

Another feature of NooA is the Content Partners. They are companies, organizations and individuals that offer courses in collaboration with NooA. So far, NooA has signed letters of intent with content partners such as Aspero Kompetens (http://www.asperokompetens.se), eFaktor (https://www.efaktor.no), Forfatterskole (http://www.forfatterskole.dk) and Phasos (http://www.phasos.com).

NooA – In the future

The initiative counts on the collaboration of partners in several European countries, so that there is the potential of developing and/or translating courses into different languages, such as Danish, German, Spanish and Portuguese in order to widen access to people at an international level. National domain names are already registered.

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NooA intends to be a reference not only for learners but also for course creators and small and medium size educational organisations in the sense that it offers transparent procedures for course design and delivery, an up-to-date LMS, and fair shares in the revenue from the course fees. NooA gives all necessary support to those who wish to transform their conventional educational programs into quality online courses.

Table 1: For supplementary information about NooA follow NooA's Online Footprint:

Website	http://www.nooa.info
CampusNooa	http://campus.nooa.info
LinkedIn	http://www.linkedin.com/company/campus-nooa
Blog	http://campusnooa.blogspot.no/
Facebook	http://www.facebook.com/CampusNooa
Twitter	http://twitter.com/CampusNooA
Kursagenten	http://www.kursagenten.no/2856/Campus-NooA-2856.aspx

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PERSONALIZED LEARNING & COLLABORATIVE WORKING ENVIRONMENTS FOSTERING SOCIAL CREATIVITY AND INNOVATIONS INSIDE THE ORGANISATIONS

Christian M. Stracke, Thomas Kretschmer, University of Duisburg-Essen, Germany

Abstract

The ARISTOTELE project starts from the fact that the wealth of European companies has progressively shifted from tangible assets (e.g. capital, resources) into intangible ones (e.g., knowledge, reputation, management skills, innovation processes, motivation, and attitude). In order to raise the competitiveness of European enterprises, it is extremely important to use information technology to support the provision of advanced solutions, finely tuned to the continuous change in competitive conditions in which organisations operate, capture and support intangible assets. Intangibles are closely related to human interactions being performed in day to day work. This is where ideas, innovation, learning, knowledge, relationships, social cohesion, and other diverse intangibles synergistically contribute to performance, competition differentiators and value creation.

Creativity and innovation inside organisations are directly related to the way people learn (informally and/or formally), collaborate, share ideas, knowledge, and organisational goals. Innovation may happen in several ways. For instance, the capability to relate events or domain knowledge to some other different domain problems and properly apply this may lead to innovative ideas.

Leading and innovative organisations typically have sophisticated innovation processes guiding their research and development activities. However, these processes rarely target the early phases of innovation and are usually limited to an organisational unit thus neglecting creativity as well as informal social networks outside the research and development area of an organisation. Enhancing the learning capability of an organisation is indeed a key element to achieve integration and merging of intangibles. But still today learning capabilities of an organisation are mainly devoted to allow acquisition of personal knowledge, skills and competencies that are very difficult to share with peers.

Current Technology-Enhanced Learning (TEL) solutions are centred on contents with very limited personalisation capabilities and then embed learning activities in the content itself. In the working environment, this type of rigid TEL solutions are integrated with the general enterprise learning objectives in a very simple (and often simplistic) way, e.g., through

definition of pre-determined learning paths (courses) for classes of employees. Moreover, the adoption of Web 2.0 approaches emphasised the central role of the user and, more in general of user-generated contents.

ARISTOTELE will enhance learning and training of workers within their organisations by defining and developing models, methodologies, technologies and tools to support the emergence of competences and creativity by self-organised acquisition, processing and sharing of new information and knowledge with peers.

The five strategic objectives for the ARISTOTELE impact are:

- Learning and Training: Improvement of the learning and training processes tailored to knowledge workers' needs and expectations;
- Human Resource Management: Supporting Human Resource development, team formation, allocation, recruitment;
- Collaboration: Improvement of collaboration among workers using social approaches and sharing knowledge;
- Improvement of knowledge management practices;
- Innovation: Fostering of innovation processes.

The presentation will outline the project and will report on the first piloting activities performed within two industrial partners.

Background

ARISTOTELE aims at supporting the missing links between three kinds of processes (organisational, learning and social collaboration processes) with the creation and development of models, methodologies and tools (ARISTOTELE, 2010).

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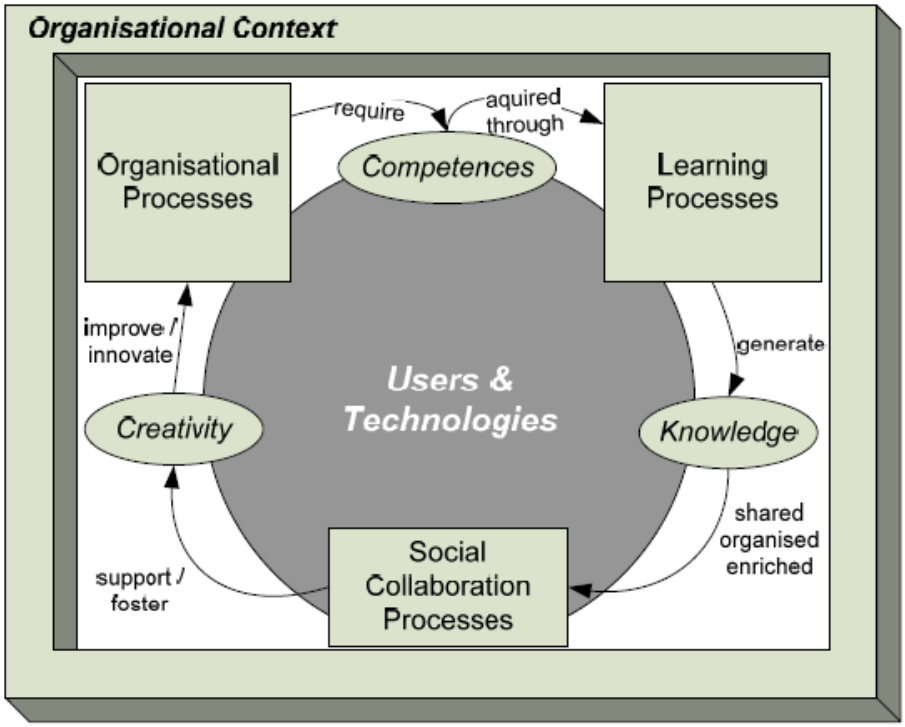

Figure 1. ARISTOTELE Vision

The IDEA Model as Shared Framework for ARISTOTELE

The ideas, needs and perceptions of all stakeholders have to be taken into account to achieve a common understanding of the different ARISTOTELE work packages. We therefore use the IDEA Model as Shared Reference Framework to illustrate the different phases and objectives and their interrelation in the ARISTOTELE project. In particular, we can use the IDEA framework as a sound basis for – in a second step – defining and categorising indicators for the ARISTOTELE project.

The ARISTOTELE evaluation is only addressing and covering one phase of the IDEA Model (Phase 3). In the following the IDEA Model is introduced in brief to explain how the ARISTOTELE evaluation is embedded in the whole project.

The abbreviation IDEA stands for four main tasks which subsume the different phases, objectives and activities of the work packages during the project lifecycle of ARISTOTELE (Stracke, 2010):

1. Initiate! 2. Do! 3. Evaluate! and 4. Act!

These four tasks and their phases and steps were developed according to the Deming cycle and the ISO standard family ISO 900x (Stracke, 2006) and modified for the specific requirements of human resources development with a special focus on competence modelling, learning, education and training. The tasks 1 and 3 are different from the Deming cycle (Plan – Do – Check – Act) because in human resources development the (initiation of) awareness

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raising (task 1) and the evaluation (task 3) are special requirements. All four tasks have to be fulfilled for the implementation of the ARISTOTELE project objectives: These phases and steps can be realized and applied according to the specific needs and the given situation of the organisation including feedback loops, individually adapted sequences and parallel implementation.

The following figure shows the Adaptation Model IDEA in an overview (Stracke, 2010):

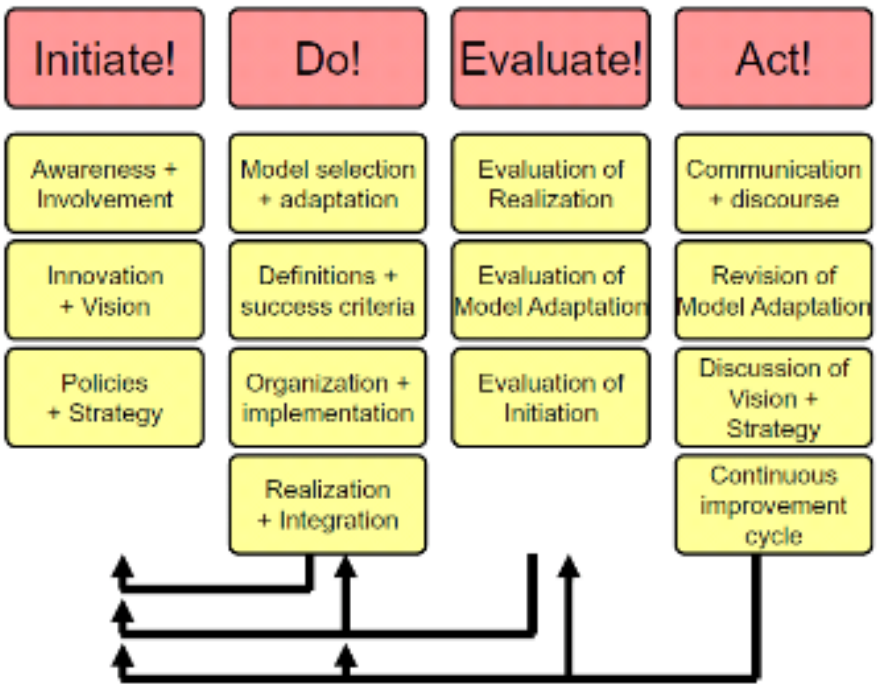

Figure 2. The Adaptation Model IDEA

The adaptation model IDEA is an appropriate model for establishing a continuous improvement cycle based on the principles of ISO 900x and the Deming cycle. We use it in the ARISTOTELE context for the specification and implementation of the project objectives and as a basis for the development and application of outcomes indicators that measure the progress and the achievement of the project results in two evaluation cycles with several phases.

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Theoretical Background of the ARISTOTELE Evaluation

Every evaluation framework should be based on a reference model or theory of its respective scientific domain. The key concepts of the domain provide the terminological basis and indicate general processes and dependencies of the domain in which the evaluation takes place. The theoretical background influences this way the objects and judgments of evaluation frameworks.

The evaluation framework of the project is based on the question: *How efficiently do the models and tools integrated in the ARISTOTELE Platform foster work and learning in organisations?*

The Evaluation Framework for Impact Measurement

This chapter introduces the Evaluation Framework for the Measurement of Impacts (EFI) that has been selected and adapted for the ARISTOTELE evaluation (Stracke, 2012). The Evaluation Framework EFI is combining the measurement of two dimensions:

1. Impact of Pilot Implementations and
2. Impact of Outcomes.

Using the Evaluation Framework EFI, the following theoretical procedure has to be applied in general:

- First, the impact of pilot implementations will be measured by so called "outcome indicators". Within one given project or process the outcome indicators will be related to the planned products of the project or process. The measurement of the outcome indicators has to focus the two dimensions of the pilot implementations: (1) the activities (within the pilot implementation) and (2) the (implemented interim) outcomes (to be tested).
- Second, the impact of outcomes will be measured by so called "usage indicators". They will be related to the strategic objectives of a given project or process: The measurement of usage indicators has to focus the two dimensions of the given project or process: (1) the activities (within the whole organization or within specific processes) and (2) the (developed and improved) outcomes.

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The following figure shows the Evaluation Framework EFI and demonstrates its relations between the two dimensions of impact measurement (usage impact and product validation):

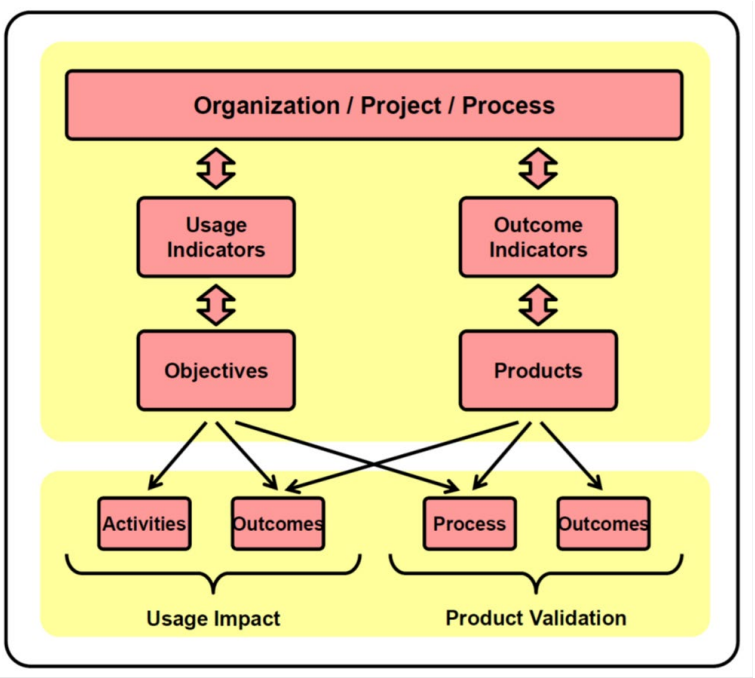

Figure 3. The Evaluation Framework EFI

Within ARISTOTELE, this general theoretical procedure is adopted by using slightly different terminologies for easier understanding and aligned with the Description of Work (DoW) and all WPs:

The pilot implementations are called Pilot Trials within ARISTOTELE.

The product validation of the interim results (Tools and Platform) is covered by the Conceptual Validation (EL1), the Usability Study (EL2), the User Validation (EL3) and the Software Validation (EL4). The measurement of the usage impact by the integrated ARISTOTELE Platform is addressed by the impact measurement (EL4) and the usage of the ARISTOTELE Platform after the project lifetime in "real" business.

The impact of ARISTOTELE results (interim outcomes) will be measured in ARISTOTELE by the outcome indicators; and the usage impact of the integrated ARISTOTELE Platform (final outcome) on the strategic objectives will be measured by the pre-usage indicators.

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The following figure explains this adoption and adaptation of the Evaluation Framework EFI for the purposes and aims of ARISTOTELE:

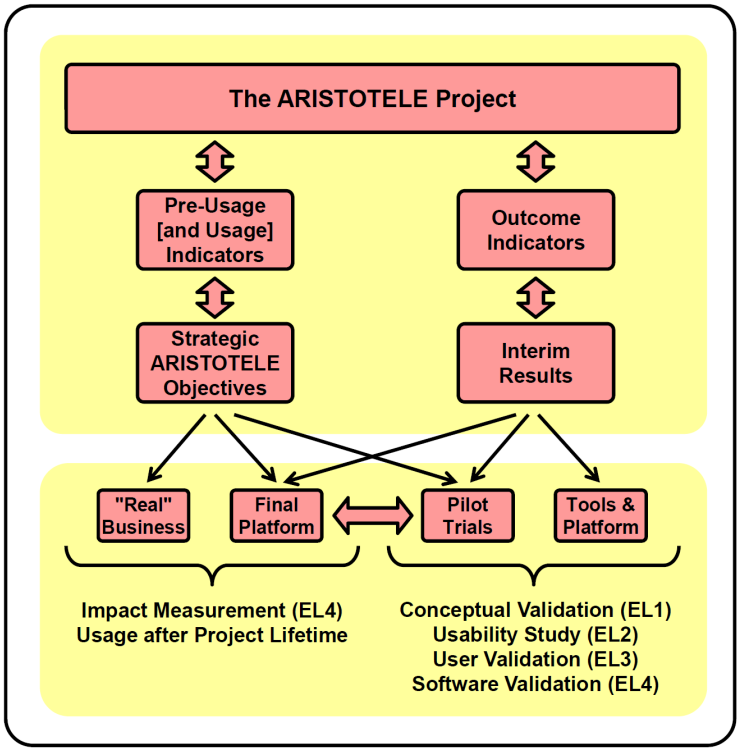

Figure 4. The Evaluation Framework EFI adapted for ARISTOTELE

Summary of the ARISTOTELE Evaluation Framework Section

The following table shows the overview of the whole ARISTOTELE Evaluation Framework: It presents the Evaluation Levels and their phases with the chosen methodologies to be used in the evaluation levels.

The first Iteration Cycle of the ARISTOTELE Evaluation Framework includes the concept validation and the Pilot Trial 1 with the Usability Study and User Validation, whereas the second Iteration Cycle covers the Software Validation and Impact Measurement focusing on both (1) the validation of the ARISTOTELE platform and (2) the impact evaluation of the usage of the integrated ARISTOTELE Platform and Tools.

Through the two iterations, the ARISTOTELE evaluation ensures the improvement and optimization of the ARISTOTELE models, methodologies, tools and of the ARISTOTELE platform as well as of the ARISTOTELE impact for best development and support of the ARISTOTELE outcomes and their long-term and sustainable usage and exploitation.

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Table 1: Overview of the ARISTOTELE Evaluation Framework

Pilot Trial	Level	Name	Methodology
-	Level 1	Conceptual Validation	Phase 1: Experts Reviews
			Phase 2: SWOT Analysis
Pilot Trial 1	Level 2	Usability Study	Cognitive Walkthrough by Semi-Structured Interview
	Level 3	User Validation	Functional Testing and Online Questionnaire
Pilot Trial 2	Level 4	Software Validation and Impact Measurement	Functional Testing
			Extended Oral Feedback on Usability (if necessary)
			Impact measurement: Interviews
			Impact measurement: Online Questionnaire

It can be stated that we have selected a strong mixture of different methodologies within the four Evaluation Levels to ensure rich and diverse evaluation perspectives and results: in particular the mix of quantitative and qualitative methodologies was addressed and established to achieve baseline data as well as quality feedback.

Evaluation Results

The following sections constitute a reduced description of the evaluation results (ARISTOTELE, 2012). For more detailed data, please contact the authors or attend the oral presentation.

Evaluation Level 1: Conceptual Validation

All models (Knowledge Model, Competence Model, Worker Model and Learning Experience Model) have been reviewed taking into account different aspects.

First of all, in order to better address the dynamicity, the concept of ARISTOTELE Business Process Pattern has been introduced. Indeed, ARISTOTELE models are static representations of enterprise-wide knowledge relevant to ARISTOTELE purposes and do not deal with ARISTOTELE dynamics. ARISTOTELE Business Process Patterns are partially specified business processes that show how to connect activities to solve a problem. Being partially specified, patterns can be extended and customized to become practical process designs. ARISTOTELE patterns are composed of activities that comply with ARISTOTELE methodologies (human resource management, learning experience generation, etc.) and consequently with the working practices. Patterns activities instantiate, use and modify items belonging to ARISTOTELE models, and their performance can be assessed by means of ARISTOTELE indicators.

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Secondly, a validation process has been carried out to underline strengths and weakness of the proposed models. We collected several assessments from different sources in order to review the models and find solutions to improve their quality. The assessment process we used is twofold: i) We collected feedbacks from the methodologies team (WP4-7) and tools developing team (WP11) in order to identify and fill gaps in the model definition; ii) we agreed with external and internal reviewers on an evaluation procedure and collected their assessments.

After the review process the models have been re-structured and their definition has been clarified also taking into account AMIS and PHI data to add some examples of real instantiation. All models have been updated, especially to make them more readable and to make evident their importance for the ARISTOTELE project.

Evaluation level 2: Usability Study

With the result of the Cognitive Walkthroughs, we obtained information on the main quality components attributed to usability as follows: Learnability ("how easy is it for users to accomplish basic tasks the first time they encounter the design?"), Efficiency ("once users have learned the design, how quickly can they perform tasks?"), Memorability ("when users return to the design after a period of not using it, how easily can they re-establish proficiency?"), Errors ("how many errors do users make, how severe are these errors, and how easily can they recover from the errors?") and Satisfaction ("how pleasant is it to use the design?").

In general, the feedback was slightly positive, but it does not surprise that the range of answers to the questions was quite wide. From the more critical comments, the following conclusions can be drawn:

a)

As the name already says, cognitive walkthroughs require a certain amount of cognitive effort from the testers, which often also includes to bridge gaps or to assume that unfinished tools or applications work well ignoring failures that will be addressed in a later version. Nevertheless, this kind of disturbances influence on the opinion of the testers. This was the case for testers that complained about missing support from the system at certain stages – they didn't see immediately how to proceed in order to perform the desired action.

Possible conclusions/consequences:

- Some problems were caused because the tools still had some "bugs" and the tester could not proceed although he/she performed the right action; it can be assumed that in a refined version this kind of problems will disappear (when the right action by the tester will result in the right reaction of the system);

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- Some problems can be solved by support offered by the system ("help-buttons") or an extensive documentation ("Handbook"); often the mere presence of support systems gives a positive impression;
- The first use of the system could be merged with an introductory session / training course on how to use the basic functionalities, thus avoiding easy errors.

b)

Closely related to a), a prominent comment was to simplify the design, the naming of the buttons and the workflow. These comments have a subjective component in the sense of personal preferences and previous experience/familiarity with similar applications.

Possible conclusions/consequences:

- See under a)
- The names of the buttons and headings could be revised and changed.

Evaluation Level 3: User Validation

End user satisfaction with the tools that the project development teams had provided was evaluated using an acceptance evaluation of the ARISTOTELE tools, the methodologies and capabilities. The rationale behind was the question how end users without a particular introduction to the ARISTOTELE tools would cope with the new tools and the implicit methodological issues. Thus, the objective was to gather data on the handling and working with every functionality that is implemented in the tools.

a)

In the first section, a selection questions from evaluation level 2 was chosen to indicate possible difference between expert testers and "normal" tester regarding usability aspects. No major differences could be found; also in the sense that test users regarded a refined version of the tools.

b)

The section on the methodologies behind the ARISTOTELE tools showed that test users in its majority considered them to be helpful and adequate; the only exception was the question "Do you feel comfortable if a system automatically calculates the level of trust existing between you and your colleagues?". Actually the test users felt uncomfortable about the idea of a "machine" judging on human principles; it is possible that the phrasing of the question had a negative influence, as it does not stress that this level of trust is calculated on basis of data provided by colleagues and superiors – the system only processes what was entered.

Possible conclusions/consequences:

- The implementation of the tools should be accompanied by an introductory session providing details and explanations on the background.

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c)

The third section provided data on the strengths and weaknesses of the tools in the opinion of the test users. The strengths were clearly seen in the fact that it is a one-stop shop for learning, communication and data exchange. The weaknesses were – as reported in EL2 – design and usability problems as well as concerns that the system might decide too many issues on its own without human contribution.

Possible conclusions/consequences:

- The implementation of the tools should be accompanied by an introductory session providing details and explanations on the background and working principles of the ARISTOTELE tools.

Outlook

In pilot trial 2, the final versions of the ARISTOTELE tools and platform will extensively be tested; impact measurement will provide data on the usefulness of the chosen approach.

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STUDENT ASSESSMENT OF THE ROLE OF THE NEW MEDIA AND TEXTBOOKS IN CLASS AND IN INDEPENDENT LEARNING

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Abstract

The aim of this research is to assess the frequency of learning through the new media and from textbooks at home and in class, and the frequency of learning from exercise books, and the correlation according to the type of school and to the form the students attend. The survey conducted on a sample of secondary school students attending either vocational schools or gymnasia (N=524) showed that students, regardless of the type of school and form they attend, most frequently tend to learn from their exercise books, and less frequently through the new media. The majority of students sometimes use textbooks from which to learn, both at home and at school. The findings also show that gymnasium and vocational school students who more frequently use textbooks in class also tend more often to learn from textbooks at home. Vocational school and gymnasium students, both in the first and in the fourth form, who more frequently use exercise books for learning, less frequently learn from textbooks at home. First and fourth form students who more frequently learn from exercise books less frequently learn through the new media. Students who more frequently use textbooks in class also tend to more frequently learn from textbooks at home. All the subsamples show that students learn significantly less frequently with the aid of the new media, regardless of how often they learn from textbooks and exercise books. This study shows that the new media have not yet attained sufficient presence in Croatian schools.

Introduction

Nearly all secondary school[1] students (ISCED 3: from educational year nine to twelve) have mobile phones, and PCs and SAT TV at home. In spite of these developments, students at school are given classes based on the traditional media: textbooks and teachers presenting lessons. The students follow the teacher's lesson, and note down new concepts and definitions in their exercise books or copy what the teacher has written on the board. The new media (the internet, social networks, tablets, mobile phones, etc.) are used by students mostly for non-formal and informal learning out of school. Changes in class are being introduced very slowly. It is often the case that teachers rely excessively on proven traditional teaching methods (lecturing, dictating). Hence, teacher-centred teaching and programmes tend to dominate

classes at school. Given this, it was considered interesting to study in what way students see and use the advantages of the new media to facilitate school learning.

The new media

With the rapid development of ICT, there has been some confusion about the type of ICT we are dealing with, since computers have existed for several decades. Indeed, there is a substantial difference between the functions of the computers of some 15 years ago and those we are using today. The same is true of mobile phones and other digital devices. Some digital devices assume multifarious roles, as has been indicated in the study conducted by Rideout et al. (2010). These authors show that a young person today does not perceive mobile phones as devices whose primary function is to send and receive messages and to place calls, but rather as digital devices for listening to music, taking photos, accessing the internet, etc., given that today's mobile phones are equipped with integrated cameras, internet access, video cameras, and so on. Accordingly, Tomasello et al. (2010) also point to the expansion of this field of research and the changing role of the new media. Therefore, the term "new media" is often used to emphasise the current modernity of the media which include ICT (Peters, 2009). Still, the term "new media" is difficult to define, and it is especially tough to determine what is "new" about the media in question. What was "new" yesterday has become "ancient" today. In this context, Ito et al. (2008, p. 8) provide the following broader and contextual definition of new media:

> *"a media ecology where more traditional media, such as books, television, and radio, are 'converging' with digital media, specifically interactive media and social communication media",*

and purposefully use the term "digital" or "interactive" media because they refer to

> *"a constellation of changes to media technology that can't be reduced to a single technical characteristic. Current media ecologies often rely on a convergence of digital and online media with print, analog, and non-interactive media types."*

The adjective "new" is used because it is defined by the situation, relations, versatility and by not being related to any specific medium. It can be said that the new media of today are multimedia, which emphasises their didactic role, or multimedia didactics (Issing, 1994). Thus, the concept of the new media these days covers a wide spectrum of media (tools) used by today's children in their everyday life, which can also be used in class.

The new media alone do not contribute to teaching efficiency, but through didactic arrangement in relation to other media, resources, material, etc., and in relation to the learning goal, content, and strategies, they can facilitate the learning process (Rodek, 2011). Thus, in certain situations, blended learning improves the learning process (Shen et al., 2009), and online forums encourage critical thinking (Szabo and Schwartz, 2010). The possibility of

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setting up virtual communities as part of the teaching process is also emphasised (Mayrath et al., 2001). In terms of mobile learning (Pachler et al., 2010), the development of the new media plays an important role, especially since certain mobile devices have developed and assumed the functions of computers with access to the internet (the tablet is a form of computer). These (and many other) studies show that it is possible to integrate the new media in the teaching process. Besides, while acknowledging the needs of students, and their individual abilities, motivation and previous knowledge, the new media allow for the individualisation of learning, which means that teaching can be focused on the student and on autonomous learning. In this way, the new media may be part of cooperative learning, learning by discovery, project learning and other active learning strategies.

Definitions indicate that the new media should also be viewed in terms of their didactic conjunction with other media, or traditional resources and material, such as textbooks and exercise books, as well as in terms of the optimal and rational replacement of traditional media and sources of knowledge. In other words, they should be perceived as part of multimedia teaching which implies the use of a variety of different media, resources and methods that complement one another. The result is that students also feel the need to use the new media in class, and indicate that there is a need to integrate these media. It is significant that the children regularly (informally) use the new media and ICT in their private lives and have well developed skills and capacities to use them. However, these facts are rarely taken into account, and the new media are not exploited in the teaching process. Of course, it must be said that it is difficult to fit the students' concept and usage of the new media into a traditional class. Using the new media in class requires a completely different way of teaching, which may be defined by the term – student-focused teaching. Therefore, in addition to using a textbook, students also express the need for their textbook to be accompanied by an interactive CD, which has been shown by Novota et al. (2012). The result of the research conducted by these authors show that 94 % of students learn from their exercise books, while Leljak-Pavleković (2001) concluded that 28.5 % of students learn maths from their exercise books.

The presented theoretical framework and the results of the empirical study show that the new media can be successfully exploited in class. On the other hand, it also shows that there are classes where learning from exercise books prevails (which means that students are obliged to listen and copy from the board), as well as learning from textbooks, with a questionable use of the new media, with which today's children are surrounded. These results are used as the theoretical framework for the conducted research.

Method

The aim of the research was to discover the frequency of learning through the new media (ICT) compared with the frequency of learning from textbooks at home, or using textbooks in class and learning from exercise books. The aim was also to see whether there is a correlation between the use of, and learning from, textbooks in class and at home, learning from exercise

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books, and learning from the new media (ICT) depending on the type of school and the form the students attend.

The group samples consisted of secondary school students (N=524), including students from gymnasia and vocational schools. There were 252 male students (48.1 %) and 272 female students (51.9 %). These students included 260 first-form students (educational year nine – 49.6 %) and 264 fourth-form students (educational year twelve – 50.4 %). According to type of school, there were 277 gymnasium students (52.9 %) and 247 vocational school students (47.1 %). The research was conducted in September and October 2012 by using the paper and pencil method in five Croatian towns and cities (Zagreb, Čakovec, Velika Gorica, Našice and Zadar).

The survey questionnaire consisted of four questions concerning the frequency of use of textbooks, exercise books and other media (ICT).

1. How often do you learn from a textbook at home?
2. How often do you use a textbook in class?
3. How often do you learn from an exercise book (from what you have written down in your exercise book in class), and
4. How often do you learn from the new media (internet, computer, CD, mobile phone)?

The responses were given on a three point scale: 1 – never, 2 – occasionally, and 3 – always.

Results and discussion

A descriptive analysis shows that 3.2 % of gymnasium students never learn from textbooks at home, 55.6 % do so occasionally, and 41.2 % always do so. A total of 68.2 % stated that they occasionally use a textbook in class, 26.4 % always use one, and 5.4 % never do. In general, the majority of students learn from exercise books, i.e. 64.3 % of them always do, 33.2 % do so occasionally, and 2.5 % never do. A total of 67.9 % of students learn from the new media occasionally, 4.3 % always do so, and 27.8 % never. It is evident from these results that gymnasium students very frequently learn from textbooks, and the fewest do so through the new media, whereas they use textbooks occasionally (at home and at school). On the other hand, a total of 69.9 % of vocational school students stated that they occasionally learn from textbooks at home, 17.4 % always do so, and 13 % never. A total of 6.3 % stated that they occasionally use a textbook in class, 33.2 % always use one, and 6.5 % never. A total of 79.4 % of students always learn from exercise books, 17.4 % do this occasionally, and 3.2 % never do so. A total of 29.1 % of students never learn from the new media, 61.1 % do so occasionally, and 9.7 % always learn from the new media. It can be seen, therefore, that vocational school students very often learn from textbooks, and much less from the new media, whereas they occasionally use textbooks to learn (at home and at school).

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A descriptive analysis conducted on first-form students shows that 58.8 % occasionally learn from textbooks at home, 5.8 % never do so, and 35.4 % always do. A total of 45 % stated that they always use a textbook in class, 52.3 % use one occasionally, and 2.7 % never do. A total of 69.6 % of students always learn from exercise books, while 26.9 % do so occasionally, and 3.5 % never do. A total of 30.4 % of students say that they never learn through the new media, while 64.2 % do this occasionally, and 5.4 % always learn through the new media. It is evident from these results that first-form students, regardless of whether they attend gymnasia or vocational schools, very frequently learn from exercise books, and quite rarely from the new media, while they occasionally use textbooks to learn at home and in class. A total of 65.5 % of fourth-form students declared that they occasionally learn from textbooks at home, 9.8 % never do this, and 24.6 % always do so. A total of 76.5 % of students use the textbook in class occasionally, 9.1 % of them never do so, and 14 % always do. It can be concluded that 73.1 % of students always learn from exercise books, 24.6 % do this occasionally, and 2.3 % never do. A total of 26.5 % of students never learn through the new media, while 65.2 % do this occasionally, and 8.3 % always learn through the new media. The results also show that fourth-form students, regardless of the type of school, very frequently learn from exercise books, while they rarely learn through the new media, and occasionally learn from textbooks at home and in class. These and the previous results (concerning vocational schools and gymnasia) are, to a certain extent, consistent with the results of Novota et al. (2012), where most students were shown to learn from exercise books. The fact that they learn from exercise books means that they probably spend most of their time in class copying from the board, and that they do not participate in active learning methods.

The application of the Spearman's Rho correlation test on vocational school students shows that there is a weak but statistically significant positive correlation between the frequency of learning from textbooks at home and the frequency of using textbooks in class ((ρ = .311; p = .000), which indicates that students who more frequently use a textbook in class also tend to more often learn from textbooks at home. There is also a weak but statistically significant correlation between the frequency of learning from textbooks at home and the frequency of learning from exercise books (ρ = -.204; p = .001), which indicates that students who more frequently learn from exercise books more rarely learn from textbooks at home. There is no statistically significant correlation between the frequency of learning from textbooks at home and the frequency of learning from other media (ρ = -.071; p = .263), and there is no correlation between the frequency of using textbooks in class and the frequency of learning from other media (ρ = .066; p = .300). This shows that most students sometimes learn from other media, regardless of how often they learn from textbooks at home and use them in class. Furthermore, it appears that there is no correlation between the frequency of using textbooks in class and the frequency of learning from exercise books (ρ = -.094; p = .139), and no correlation between the frequency of learning from exercise books and the frequency of learning from other media (ρ = .119; p = .062). This shows that the majority of students still learn from exercise books, regardless of how often they use a textbook in class and how often they learn from other media (Table 1).

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Table 7: Correlation between the frequency of learning through the new media (ICT), textbooks and exercise books of vocational school students

Scales		**1**	**2**	**3**
1	Frequency of learning from a textbook at home	-		
2	Frequency of use of textbooks in class	**.311****	-	
3	Frequency of learning from notes in exercise books	**-.204****	-.094	-
4	Frequency of learning from the new media	-.071	.066	.119

**p< .05; *p< .01

The application of Spearman's Rho correlation test on gymnasium students shows that there is a slight but statistically significant positive correlation between the frequency of learning from textbooks at home and the frequency of using textbooks in class (ρ = .149; p = .013), which indicates that students who more frequently use a textbook in class also tend to learn more often from textbooks at home. There is also a weak but statistically significant correlation between the frequency of learning from textbooks at home and the frequency of learning from notes in exercise books (ρ = -.285; p = .000), which indicates that students who more frequently learn from exercise books more rarely learn from textbooks at home. On the other hand, there is no statistically significant correlation between the frequency of learning from textbooks at home and the frequency of learning from other media (ρ = -.027; p = .657), and there is no correlation between the frequency of using textbooks in class and the frequency of learning from other media (ρ = .105; p = .081). In other words, most students sometimes learn from other media, regardless of how often they learn from textbooks at home and use them in class. There is also no correlation between the frequency of using textbooks in class and the frequency of learning from exercise books (ρ = -.016; p = .797), and no correlation between the frequency of learning from exercise books and the frequency of learning from other media (ρ = .011; p = .850). This shows that the majority of students still learn from exercise books, regardless of how often they use a textbook in class and how often they learn from other media (Table 2). It must be emphasized that gymnasium and vocational school students who more frequently use textbooks in class also use them more frequently at home, while they use the new media significantly less frequently. Consistently with this, it may be assumed that the use of textbooks and of the new media may depend upon how frequently the teacher uses a textbook, and how often he/she uses the new media. In other words, it may be assumed that students would use the new media much more if teaching in class was conducted with these media.

Table 2: Correlation between the frequency of learning through the new media (ICT), textbooks and exercise books of gymnasium students

Scales		**1**	**2**	**3**
1	Frequency of learning from a textbook at home	-		
2	Frequency of use of textbooks in class	**.149****	-	
3	Frequency of learning from notes in exercise books	**-.285****	.016	-
4	Frequency of learning from the new media	-.027	.105	.011

**p< .05; *p< .01

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The application of Spearman's Rho test on first-form students shows that there is a weak but statistically significant correlation between the frequency of learning from textbooks at home and the frequency of learning from exercise books (ρ = -.278; p = .000). In other words, students who more frequently learn from exercise books tend to learn less frequently from textbooks at home. There is also a weak but statistically significant correlation between the frequency of learning from exercise books and the frequency of learning from other media (ρ = .170; p = .006), which indicates that students who more frequently learn from exercise books also learn more often from other media. There is no statistically significant correlation between the frequency of learning from textbooks at home and the frequency of using textbooks in class (ρ = .090; p = .148), and there is no correlation between the frequency of using textbooks in class and the frequency of learning form exercise books (ρ = .010; p = .876). In other words, the majority of students sometimes use a textbook in class, regardless of how often they learn from it at home and how often they learn from their exercise books. There is no correlation between the frequency of learning from textbooks at home and the frequency of learning from other media (ρ = .016; p = .797), and there is no correlation between the frequency of using textbooks in class and the frequency of learning from other media (ρ = .119; p = .055). This means that the majority of students occasionally learn from other media, regardless of how often they learn from textbooks at home and how frequently they use them in class (Table 3).

Table 3: Correlation between the frequency of learning through the new media (ICT), textbooks and exercise books of first-form students

Scales		**1**	**2**	**3**
1	Frequency of learning from a textbook at home	-		
2	Frequency of use of textbooks in class	.090	-	
3	Frequency of learning from notes in exercise books	**-.278****	.010	-
4	Frequency of learning from the new media	.016	.119	**.170****

**p< .05; *p< .01

The application of Spearman's Rho correlation test on fourth-form students shows that there is a weak but statistically significant correlation between the frequency of learning from textbooks at home and the frequency of using textbooks in class (ρ = .259; p = .000). This indicates that students who more frequently use textbooks in class more frequently learn from textbooks at home. There is also a weak but statistically significant correlation between the frequency of learning from textbooks at home and the frequency of learning from exercise books (ρ = -.281; p = .000), which indicates that students who more frequently learn from exercise books tend to more rarely learn from textbooks at home. There is no statistically significant correlation between the frequency of learning from textbooks at home and the frequency of learning from other media (ρ = -.108; p = .079), and there is no correlation between the frequency of using textbooks in class and the frequency of learning from other media (ρ = .105; p = .088). This means that the greatest part of students sometimes learn from other media, regardless of how often they learn from textbooks at home and use them in class. There is also no correlation between the frequency of learning from exercise books and

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learning from other media (ρ = -.048; p = .442), and there is no correlation between the frequency of using textbooks in class and the frequency of learning from exercise books (ρ = -.022; p = .721). In other words, the majority of students still learn from exercise books, regardless of how often they use a textbook in class and how often they learn from other media (Tables 4). The data that show that all the students (first/fourth forms, gymnasium/vocational school) who more frequently learn from exercise books more rarely learn from textbooks has also been confirmed by recent research (Novota et al., 2012), and indicate that the exercise book is the students' primary source of knowledge. It can also be seen from the overall sample that students learn from the new media significantly less, regardless of how often they use textbooks, which can be explained by the fact that a great number of teachers do not recognise and use the new media in class.

Table 4: Correlation between the frequency of learning through the new media (ICT), textbooks and exercise books of fourth-form students

Scales		**1**	**2**	**3**
1	Frequency of learning from a textbook at home	-		
2	Frequency of use of textbooks in class	**.259****	-	
3	Frequency of learning from notes in exercise books	**-.281****	-.022	-
4	Frequency of learning from the new media	-.108	.105	-.048

**p< .05; *p< .01

Conclusion

It can be seen that ICT and the new media in general are neither beneficial nor detrimental in themselves when used in the teaching process, but their didactical function in class facilitates learning. Therefore, ICT and the new media in general should be perceived in synergy with traditional sources of knowledge, such as textbooks, exercise books, the real world, etc., or as elements of multimedia teaching. Based on this research and on this sample, it may be concluded that gymnasium and vocational school students, both those in the first form and fourth forms, tend very often to learn from exercise books, and very little from the new media, while they sometimes learn from textbooks (at home and at school). With regard to gymnasia and vocational schools, and in the first and fourth forms, it may be said that students who more frequently learn from exercise books generally more rarely learn from textbooks at home, and that most students sometimes learn from other media, regardless of how often they learn from textbooks at home and how often they use textbooks in class. Gymnasium and vocational school students more frequently use textbooks in class, and also more frequently learn from textbooks at home. The majority of students still learn from exercise books, regardless of how often they use a textbook in class and how often they learn from other media. First and fourth-form students who more frequently learn from exercise books more rarely learn from textbooks at home, and sometimes learn from other media, regardless of how often they learn from textbooks at home and how often they use them in class. In general, students are recommended to use the new media for learning, but classes continue to be mostly teacher-focused, and traditional teaching methods (dictation) still prevail. This is confirmed by the fact that students very frequently learn from exercise books, as well as from

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textbooks. This also indicates that students tend to more frequently use a source of knowledge outside the classroom if they use it in class. Why this is so may be an incentive for further research, but also an incentive for conducting classes with the help of the new media and ICT in general.

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[1] Compulsory education in Croatia lasts eight years, and secondary schools (ISCED 3) last either three or four years. Gymnasia and vocational schools (for example, schools of economics or technical schools) last four years (educational years 9 to 12).

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THE VIRTUAL UNAM: ENHANCING LEARNING FOR DISTANCE EDUCATION STUDENTS

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Introduction

This is a case study regarding the use of technology for learning for distance students at the University of Namibia. This case study is work in progress and is experimenting the ways in which learning could be made more interesting for distance students with the use of technology. In this case study we will explore how a more older generation and rural based distance students be attracted to learning through technology.

Distance education has been part of the higher education establishment in Namibia since the mid-1980s when the Academy of Learning, the first tertiary education in the country was first established. Even today, Namibia, a vast country of 824,292 square kilometres and with a population of 2.21 million (2011 Preliminary Census report) has only one public university, the University of Namibia, one public Polytechnic, the Polytechnic of Namibia (soon to become a University of Science and Technology) and one private University, the International University of Management. The current student population of the University of Namibia currently stands at 16,000. In 2011 conventional students made up 75 % of the university student body, 25 % were distance students and about 5 % is made up of postgraduate students (Masters and PhDs). The distance students of the University are more older than conventional students, with an average age of 40 years old. Many of them are from previously disadvantaged backgrounds in terms of location (rural areas) and socio-economic conditions (poor families) and many of them are the first in their families to go to university.

About 85 % of distance students are in full time employment, mostly teachers, nurses and business people and about 30 % have their children also attending the same institution, the University of Namibia (UNAM). It means that the 30 % is paying for their own tuition fees as well as those of their children, if the young students did not manage to acquire a government loan or some sort of a bursary. For those with own kids at university, it means instead of taking care of their own needs of for instance purchasing a laptop they instead take care of their kids' needs. So the only computer they have might be just at their nearest UNAM campus or regional centre, and those who are lucky enough might have a computer at their work places, of which the majority are not internet connected.

Ever since the creation of UNAM and to cater for the learning needs of distance education students scattered all over this vast land the University of Namibia established 9 campuses, with a tenth one on the way, and 8 regional centres. However we found that, still the distance students travel as far as 300 kilometres to reach the nearest UNAM centre or campus. The University regional centres are mainly used in providing services to distance students of the University of Namibia, who are enrolled in a variety of undergraduate degree and diploma programmes. Yet, it has been noted that only about 40 % of distance students at UNAM manage to complete their programmes of study on schedule. The student satisfactory survey that was conducted during 2010 revealed that students have difficult in understanding and completing assignments for the fact that many of them are far away from lecturing staff and learning resources.

Early 2012 UNAM introduced "My UNAM Portal", a virtual/digital learning platform that enables lecturers to load learning materials and students to access such materials. The portal is a student online service, which allows students to access information including course materials and notes, view class and examination timetables as well as print proof of registration and academic transcripts. Thus, the portal has the potential to become a virtual learning environment or learning management system (VLE/LMS).

Findings of the 2012 study on the portal

A study conducted among sixty six (66) distance students enrolled in Policy Studies in Adult Education course revealed that even though about 90 % (60 out of a total of 66 students) of students were able to access reading materials using the UNAM Portal, only 30 % became regular users and accessed supplementary learning materials, tests and feedback posted on the portal. It is this 30 % that performed very well in both assignments and examinations. Many of the students who did not make regular use of technology for learning reported that they found the portal difficult, boring and confusing. On the basis of this information the Centre for External Studies have developed further instruments to assess ways in which the portal could be made more attractive to distance students, more pedagogical sound to a more older and rural based distance student body. In addition to the above findings it was also found that the portal as a learning system has the following strengths and weaknesses:

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Table 8: Strengths and weaknesses of the UNAM Portal as a learning environment/system

Strong elements of the portal	**Weak elements of the portal**
Highly supports teaching presence and to some extend cognitive presence.	It does not support social presence.
Few distance students (30 %) used it regularly.	The portal is more of a file sharing system than it is a learning management system
Students who used the portal regularly performed better academically.	None of the student logged a query to the lecturer using the portal.
The portal allowed the lecturer to innovate and change teaching strategies.	The lecturer is not able to interact with a group of students.
With the portal the teaching of on campus students could be used enrich the learning of distance students	Students are not able to interact with each other.
	Learning materials cannot be differentiated and much better organised for easier access and learning

Literature Review

During the early and late1980s Thomas W. Malone (1981; 1983; 1987) as part of his PhD dissertation extensively explored what makes learning fun. His conclusion is that what makes learning fun is not necessarily the educational part of the learning activity, but the games and activities designed to motivate students to engage with the educational part. His research concentrated on exploring how instruction could be designed in a way that captivates and intrigues learners as well as educates them. That question is as relevant today as the early 80s, especially as regards to distance education in the age of increased use of information and communication technologies (ICTs).

Distance education had come a long way from the debate that the field has no system of teaching (Keegan, 1986) to today when we all agree that distance education is discipline in its own right. The use of technology for learning purposes is as much used in distance education as in any field of study. Van Raaji and Schepers (2008) however emphasise that the success of virtual learning environment depends on the students' acceptance and use of such learning systems and Bandura and Skunk, (1981) has warned us many years back that students are more interested in proximal goals than they are in distal goals. This is so true for distance students, for them these proximal goals are to pass examinations and receive the qualifications. Anything that helps them to get information and hints and skills to use to answer assignments and examinations questions are more interesting and will receive their full attention. For me it means then that distance students will only use virtual learning systems if they are easy/friendly to use and relevant to their needs. As Möwes (2005) discovered distance students are less interested in something that takes their thoughts way from the course requirements and might be difficult to convince them to engage in learning for the fun of it.

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Further, working with distance students in Namibia we found that students' circumstances play an important role in enhancing learning. Rural distance students are found to care less about the fancy way of presenting learning materials and find it hard to comprehend course content if such materials are not straight forward. They also shy away from technology because it is found to be time consuming (Nekongo-Nielsen, forthcoming) and require some kind of motivation to be able to use technology for learning. For distance students time is not readily available especially those who are working and therefore the less study time they have they would like to use it wisely. This study would look into factors that both will intellectually engage and attract more distance students in Namibia to using the technology for learning purposes.

Malone and Lepper (1987, p.229) defined intrinsic motivating activities as those are activities that motivates participants for their own sake and not necessarily because they are "receiving external rewards or avoiding some external punishment". They went on to suggest that first four intrinsic motivations present in any learning situations are "challenge, curiosity, control and fantasy" (Malone & Lepper, 1987, p.231).

Challenge, curiosity and control are the intrinsic motivations that this study would explore to see whether these will stimulate learning among distance students. Students will be provided with motivations to want to use the technology by posting examination scopes, answers to tests and examples of questions that are likely to come into examinations on the UNAM portal. Test questions and feedback, assignments feedback, examination scopes and mock final examinations will be used as motivations to attract students to using technology. Students would also be asked to submit answers to the mock examinations via email and the lecturer will provide individual student feedback on the portal which could only be accessed once the students are logged on the portal using their student number and University provided passwords.

Research Methods

The 2012 study has used the opportunity to make supplementary learning materials available through the UNAM portal and saw many distance students for the first time using the technology/computers to access the learning materials. The popular area was the answers of tests given to fulltime students and responses/feedback to assignments.

This case study is work in progress and a continuation of the 2012 study on the applicability of the UNAM portal to the learning of distance students. Here I will experiment the many ways of making learning fun and interesting and therefore attract more distance students to utilising the portal for their learning purposes. In this case study the main question to be answered is how the older generation of distance students can be attracted to learning through technology?

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This will be qualitative study which seeks to find out whether the UNAM virtual learning environment, UNAM portal, design leaves up to the standards of other virtual learning environments and whether, if provided with good pedagogical design, it will enriches distance students learning. So far a total of 100 students, 34 full time and 67 distance students, are registered for Policy Studies in Adult Education, the course on which the experiment would be based. However, it should be noted that the UNAM registration period ends on this Friday, 8 February 2013 and that means the number of students might increase. Needless to say that the study will be conducted among the 2013 students registered for Policy Studies in Adult Education, the course that I teach.

For this study, the UNAM portal would be used to enable students to access the course outline, supplementary learning materials, learning activities for each unit, tests/ assignments and mock examinations and receive feedback from the lecturer. This research is interesting because it is targeting a more older and rural based student body whose access to learning resources is fairly limited. The experiment will be coupled with providing training and guidelines to students on how to use the technology, send assignments as well as receive feedback.

The following research questions/statements would be used to guide the study and collect data from distance students:

- What can be done to attract more distance students to make use of the University's virtual learning environment, the UNAM portal? How can it be made pedagogical sound and a more attractive learning environment for distance students?
- Explore whether when learning is made fun with the purpose of attracting students to make use of the technology is synonymous with effective student learning.
- Determine the factors that contribute to both attracting students to the technology and to effective learning among distance students living in rural areas.
- What physical conditions are conducive to making learning attractive and worthwhile?

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CASE CONNEXION – CASE STUDIES IN A VIRTUAL LEARNING ENVIRONMENT FOR USE IN THE THEORETICAL TEACHING IN NURSING

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Based on problem-based learning method and a desire to support students' different learning styles The Department of Nursing Education at University College Lillebaelt and University College South Denmark have developed a virtual learning environment in the form of a ward at a hospital, where elements are provided to offer the nurse students the possibility to work with realistic case studies in a realistic virtual universe.

The fundamental aim in the problem-based learning method, and with it the virtual learning environment, is to improve the nurse student's professional skills in relation to identifying, formulating and analysing problems in practice in collaboration with others and done on a reflected basis considering possible actions and solutions within basic human values. Hence the nurse student takes a personal responsibility for his/her learning process and develops strategies for future lifelong learning professionally and personally.

One of the didactic consequences of the problem-based learning method is that the teaching focus has shifted from the teacher's mediation of an academic curriculum to more functional academic skills, which emphasizes that students learn to apply academic theories, concepts and methods for solving problems in practice. The starting point for the students learning is an exemplarily case study which can be used as an example for similar situations. The cases must be as realistic as possible.

Because of this the hospital ward – named CaseConnexion and constructed in Second Life, a 3D virtual world – is as close as possible to the natural environment the students meet at a hospital. The students can enter the environment at all times and regardless of their physical location. They only need a computer and internet access. They move around in the guise of a personal avatar dressed in a nurse uniform and communicate via voice or chat with other avatars representing other students or teachers. External persons with special professional skills can easily be invited into the environment, and students from other nursing programs may participate in the learning process in order to collaborate and share knowledge and experiences.

The learning environment is structured as a ward with a reception and corridors decorated with facilities available in a modern hospital fx.desk, interactive computer acting jobs, access to E(lectronic) P(atient) J(ournal). A meeting room with furniture and number boards, where individual presentations can be uploaded, two patient rooms and a dialogue room, where the student can practice difficult dialogues with patients and their relative in role-playing exercises.

Two cases containing a number of nursing problem have been developed, and to make the cases as authentic as possible. They have been developed by representatives from the clinical practise and teachers from different nursing schools.

The cases are complicated with several problem areas because that is what the students meet in practise. In a virtual learning environment the student can practise how to define and delimit the relevant problem complex under supervision of their teachers.

Each patient representing a case is situated in a room and can in some way communicate his/her situation and needs to the students in a way that emphasize the need to identify, formulate and analyse problems in practice in collaboration with other and on a reflected basis consider possible actions and solutions.

Both rooms contain a range of interactive elements to perform nursing tasks which support the student learning and coach the students in the required procedures

The rooms also contain a range of exercises to support the students learning.

The exercises are set out to support learning in progressing taxonomic levels.

- At the basic level the students train basis theoretical nursing skills via different kind of tests – the student can work this on his/her own and do the tests as often as he or she needs.
- At the next level the students must sort out a solution to a defined problem – the student can work alone but collaboration is preferable
- At the top level the students have to search out the problem complex and find possible solutions – collaboration is required.

Interactive learning objects in CaseConnexion can be relatively easily changed and adapted to current needs in order to achieve progression in student learning and take up new cases.

Also the students can participate in virtual presentations held by practitioners as well as lectures. Currently it is across regions. But in the future it will be across nations to support an international learning environment among students, lecturers and practitioners in nursing education.

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In the evaluation of the learning potential in the virtual environment the students emphasizes that the environment provides the opportunity to join the tasks at their own pace. The learning environment feels safe and there is room for error, so you can try things without having to go beyond a living man.

But they also draw attention to the fact that using CaseConnexion has caused some technical problems as to the technical side. Computers have not worked properly when running CaseConnexion caused by problems with wireless internet connection, and with the graphics card in the computer.

It also takes some time and experience to smoothly navigate in Second life and you have to learn to use the interactive facilities.

For some students – and teachers – this has been an insurmountable obstacle, and they have stopped using CaseConnexion, but to others it has been a new and challenging learning possibility in addition to other teaching methods.

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ADVANTAGES AND DISADVANTAGES OF DIGITAL TEXTBOOKS

Gerard Gielen, Lieven Jacobs, Katholieke Hogeschool Limburg, Belgium

Introducing

For hundreds of years, textbooks have put a world of knowledge in the hands of students. But while the way people learn has changed dramatically, the traditional textbook most of time has stayed the same. In the past years, leading technology companies in Belgium have made big strides in bringing tablet computers into classrooms and stimulating teachers to work with interactive boards. Textbook publishers now have changed their strategies and have made their textbooks digital. When these textbooks can be projected on the interactive board we can call them digital textbooks, digital boardbooks or e-textbooks. Digital textbooks mostly contain the same content and layout as hardcopy versions but are made available for web viewing or download to a computer. There is no doubt that schools have the task always to offer new methods and learning materials to learners. Using digital textbooks is one of the ways to improve teaching and learning tools. It benefits learners by saving time, enhancing learners' computer skills, and offering a paperless system.

Digital textbooks offer various interactive functions, and provide the teacher and learner with a combination of textbooks, reference books, workbooks, dictionaries and multimedia contents such as video clips, animations, and virtual reality, both at school and at home, without the constraints of time and space. Teachers and learners can create or adapt their own textbooks while using the digital textbook, underlining the important parts, taking digital notes, and ultimately combining the contents with high-quality, reliable knowledge that is their own. But while the availability of new devices is certainly critical, the successful transition to digital textbooks relies on many interconnected factors. In using digital textbooks on tablets and the interactive board, device availability is just the beginning of new didactics.

What is it?

Digital textbooks are electronically available digital handbooks. They look like paper printed handbooks, but they are completely digitalized and can be opened on a computer, a tablet or even smartphone and can be projected to a white screen with computer and beamer. The teacher can project the digital textbook in front of the classroom on big screen and add things like text or images, mark up things, zooming in on topics in the book without losing quality of images, show immediately the answers to exercises without writing, increase pictures, play music or texts in language lessons, show videos with one click in the textbook, immediately

opening links to the internet, switching from the text book on the board to a completely empty white board with digital tools like pen, geometrical figures, digital eraser, markers, etc.

In the world of digital didactics there is a race to bring tablet-based digital textbooks into the classroom. Since launching the iPad, Apple has made a big push in education with the launching of iBooks (http://gigaom.com/2012/07/25/how-apple-is-replacing-macs-with-ipads-at-school/). Amazon announced the Kindle and recently a new Whispercast feature to help schools centrally purchase and distribute content to a fleet of student devices. Microsoft's Surface (http://gigaom.com/2012/10/16/microsoft-launches-surface-rt-tablet-for-499-cover-extra/), as well as Samsung's Galaxy Note 10.1 (http://gigaom.com/2012/08/15/samsung-takes-on-ipad-again-with-galaxy-note-10-1-and-stylus/) and Chromebook (http://gigaom.com/2012/10/18/video-hands-on-with-googles-new-249-chromebook/) (released with Google), are also contenders for new classroom tools. With each new launch, someone inevitably declares the impending end of physical textbooks (http://www.redorbit.com/news/technology/1112714973/amazon-school-books-101712/) and blaming teachers who still detain traditional textbooks and traditional teaching methods. The technology industry plays a significant role in the transition to digital textbooks. Making devices available and affordable is not the only thing in digitalizing teaching. The tendency of the public to gravitate toward electronic formats suggests this trend will only continue. And given that young people are typically most receptive to technological advances, the digital textbook market also seems likely to thrive. Textbooks have not gone the education market yet, but many educators say that it will not be long before they are replaced by digital versions – or supplanted altogether by lessons assembled from the wealth of free courseware, educational games, videos and projects on the internet. Digital texts can save our youth from lugging along antiquated, heavy, expensive textbooks is the slogan.

Digital textbooks are available in two basic methods. Some digital textbooks are only available online (material is accessed directly via the internet connection). Others allow the teacher to download or install the digital textbook to his computer for use while not connected to the internet. Often, access to downloadable digital textbooks is limited to one computer, while online-viewable versions are able to be accessed from any computer, tablet, etc. So it is important for teachers to know for what reason they want to use these digital books and what technology is available. Of course a very important issue for considering digital learning with digital textbooks is the price of all.

In Belgium almost all big textbook publishers have made their handbooks for learners digital at this moment. The Dutch word for these books is 'Bordboek'. Digital textbooks are available for different levels of schools: elementary education, primary schools, secondary schools and even higher education. All educational topics are covered: science, languages, technology, religion, etc. Schools in Belgium are using the books in different ways. Some schools are only using these digital textbooks for projecting them on the screen while the learners still have printed hardcopy books. Other schools have thrown away all paper books for learners and learners are only using digital books on computer or tablet, so called tabletschools. Students have only a tablet in their schoolbag and no books anymore. At their best, digital textbooks

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give a learning experience that boosts engagement, adapts to student learning, tracks performance and ensures up-to-date content – all while potentially saving costs in the long term. But the price is not the only important thing.

The key to successful using digital textbooks is the relationship among six concepts:

1. the purposes that the digital products will serve,
2. source document characteristics and quality of the textbooks,
3. technology capabilities brought to bear the learning process,
4. technical accommodation and equipment,
5. capabilities of the teachers and learners to work with the books,
6. amount of money to pay everything.

If a teacher or student needs to decide between an actual printed textbook and its digital textbook cousin, there are a few things that have to be considered. Both options have advantages and disadvantages.

Advantages

Interactivity

Digital textbooks are no longer limited to static pictures to illustrate the text, now teacher and students can work with images with interactive captions, rotate a 3D object, or have the answer spring to life in a chapter review. The teacher can flip through a book by simply sliding with the finger or digital pen over the screen of the interactive board. Also learners can do this if they use the digital textbook on a tablet or computer. They can highlight text, taking notes, searching for content, and finding definitions in the glossary on an easy way. Some readers have connectivity features that provide instant access to the Internet. Many digital textbooks have the ability to add 'layers' right on top of each page. Students and teachers can take notes, add drawings, write questions, and work out problems as needed. No need to keep a separate notebook or binder for class notes, homework, or miscellaneous associated work.

Time-saving

Digital textbooks alleviate a number of tasks in the classroom. So for example, you don't have to write down all exercises and answers prior to the white blackboard. They are called with the press of one button. During the lesson more time is left to spend to work with learners and their specific learning problems, so you can focus on the essence of the learning process. The teacher can invest more time in students who need specific monitoring and guiding.

All materials are combined together

In a digital boardbook all necessary materials are included. So all workbooks, textbooks, work-study books, remediation and enrichment exercises, tests, etc. and of course all the solutions. Also audio and video files can be included in board books. So you have everything at hand

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with a simple push of a button. Communication/collaboration tools can be added (forum, chat, email) to enhance exchange between learners and with teachers. Since all of these are now located in the textbook, there's no need for teachers or students to collect many materials from many sources to have all they need for a topic. It depends on the textbook publisher's choice how thorough the digital textbooks are organized.

Reducing printing costs and ecological

Paper textbooks are expensive to produce and expensive for schools to buy. This is the reason why schools are forced to use a book for several years to make it worth full buying. But information changes so fast that some textbooks are out of date almost before they're published. And as books are passed along from one student to the next, they get more highlighted, dog-eared, tattered, and worn. Electronic handbooks have the advantage as reducing printing costs and making it easier to revise or add things to the handbook. It is also a good thing for the nature: no use of paper is saving lots of threes and it doesn't use poisoning ink.

Less weight for children and teachers to carry

Often times, textbooks are hefty and heavy, and for students taking multiple classes, the hassle of carrying a bunch of heavy books can become troublesome. Digital textbooks give students the option of having thousands of textbook pages compressed into a very portable laptop or tablet. Backpack weight is an increasing problem among kids. Studies show that heavy backpacks can lead to both chronic back pain and poor posture. Many kids are carrying a quarter of their body weight in textbooks. Because the handbooks are digital stored, the teacher and the learners only have to bring with them a computer or tablet. Thousands of pages are accessible in a few clicks without carrying with them. With all their books on a single tablet or computer, students will have no problem carrying them wherever they go. Who wouldn't want to save some money and carry less weight from class to class?

Easy searchable documents

Because of the sophisticated technology all digital materials are easy searchable. For example, many digital textbooks offer search functions, which make searching for specific information a swift and easy process. Students using digital textbooks are able to search for keywords and phrases quite easily. With a hard copy, you will have to take the time to skim through pages or search the book's index. It is now possible to represent almost any type of traditional research material with such visual quality that reference to the original materials is unnecessary for most, if not all, purposes. Of course the digital books have to have this function. At this moment it is often a disadvantage for the Belgian distributors of digital learning handbooks that a search function is not available.

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Taking notes

Taking notes can be a much cleaner process electronically, as opposed to scratching some notes into the margins of a page. Plus, if you need to include a lengthy quote for a research paper, copying and pasting from an e-textbook will save time over typing an entire quote manually.

Converting to audio files for learners with visibility or other learning problems

Not only texts can be increased easily for learners with blindness problems, one interesting convenient feature found in some e-textbooks is the ability to have the e-textbooks converted into an audio file, making it easy to listen on headphones and more suitable for learners with learning disabilities.

Always and everywhere available

Digital textbooks are mostly available through the internet at all times and places. They combine all the supporting material in the textbook for you and your colleagues at school and make it available online. Wherever you are: at school, at home or anywhere, anytime you can consult teachers material, download or print. You can share easy all information with simple clicks to colleagues and learners.

Up to date information

Instead of waiting some years for using new printed handbooks because of the investment in paper the digital textbooks can be replaced immediately. So teachers and textbook publishers can not only correct mistakes, or add extra information but they can follow very quickly all new movements in society. The textbooks are always up to date with new developments.

Conclusion

New technology is leading innovation in the way publishers create textbooks. The idea of a static reading of paper books is being bypassed with a mission to create interactive content that brings subject matter to life through images, video and social media. The goal is to allow students to experience content in new ways that will help them be more effective learners.

Disadvantages

Reliance on technology

Digital textbooks keep you reliant upon a computer. Unless you are willing to print out all the pages in your digital textbook, you're going to be chained to your computer 100 % to do your assignments. But there is a serious dependency of electricity, charged batteries, working technology, remembering passwords, logins, etc. Though the learner may have all of the textbooks conveniently stored in his electronic device, he could be left feeling frustrated if he forget to charge it and the battery is running low in the middle of an important classroom discussion. Unlike with paper books, to read the digital textbooks learners have to remember

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to recharge the e-device; digital books are rendered useless if the device to view them does not work. In several schools there is also no fast broadband internet connection. Working with digital textbooks on tablets demands fast (wireless) internet. Most of the schools are not equipped for this at this moment. When all learners go together on the internet there can be a queue with lots of necessary waiting time for downloading. Not only thinking of problems with electricity someday, one of the big issues in technology is that they can broke down and if you believe in Murphy, it will always be on moments that you don't expect or don't want to happen. If a teacher has prepared his lesson using a digital textbook and there is a computer, electricity or internet problem or he has lost his login for the digital textbook, he has to be creative to find other ways in teaching, especially if he counted on the digital answers to all his exercises. In addition, digital textbooks depending on hardware and software are more easily damaged than a printed book. Any program that is on a computer and can be connected to the internet can be risky to the computer or device by creating vulnerabilities for attackers to exploit. Digital files are more prone to corruption. If you've ever had a computer crash, you can relate to the dismay of losing all of your important documents. Additionally, if you are going to use digital textbooks, you'll likely be doing constant upgrades on your software programs to support current editions and your older textbooks after a period of time may not be accessible to use as future references. Printed hardcopy books and the blackboard with chalk never let you down. If the teacher would rather not worry about the issues that digital distribution can cause, he may be better off by getting actual hardcopy textbooks.

Price related to computer dependency

Many downloadable digital textbooks are only accessible through one computer. Such digital rights management may cause issues if a student's computer fails or becomes inaccessible. Next, many digital textbooks from major publishers expire after a set period of time, essentially making the digital textbook more of a rental than a purchase. In some cases especially with computer problems it is more expensive than printed books. Before a teacher wants to say goodbye to the printed textbook, it's important to consider the limitations of digital textbooks. In some instances, features that are typically considered benefits can also be drawbacks. For example, digital textbooks cost less individually, but when you factor in the cost of buying a tablet, a reader or laptop and reading or running software the savings may not be as significant.

Danger of still traditional teaching

While some digital textbooks provide interactivity, others display what are basically page scans. Working with these kind of digital textbooks projected on the whiteboard is still using same classical didactics as working with printed textbooks. Learners are sitting in the classroom watching and listening to the teacher on the typical same traditional way. Only projecting a textbook on the screen is still continuing old traditional teaching methods. If a teacher only use the digital textbook to project the handbook on the whiteboard and teach on a traditional way like before, using these kinds of technology is not worth full.

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Acceleration of learning process

Because all information is available and quickly reachable, there is a danger of not fulfilling essential basic teaching didactics about gradual teaching with enough time for the processing and assimilation of the information, time for making and solving exercises together, lack of differentiation and individualization of the learning process.

Screen glare and eyestrain

Reading textbooks in the form of an electronic document are usually pretty readable, but after a while the digital format can get a little tough on the eyes. The learner will probably spend a great deal of time staring at the computer researching and doing assignments. Having to stare all the time at a screen to read digital textbooks may be a bit too much for some. Even the slightest glare on a screen can be off-putting and could lead to unnecessary eye strain. Many students find they begin to experience difficultly reading the e-textbook if chapters are tedious or long. The display resolution of computer screens and electronic devices is considerably less than the print quality produced by a printing press. Reading from a computer lacks the familiarity and comfort of reading from a hardcopy book and holding a book it in your hands, smelling the paper, etc. A paper book can be opened and flipped through, while an electronic text is more difficult to navigate.

Financial cost and technological problems

The required investment for digital textbooks, computer and beamer including tablets or individual computers for all learners is tremendous and this technology goes out of date very soon. The digital future is not quite on the horizon in all classrooms. For one thing, there is still a large digital divide. Not every student has access to a computer, an electronic reader device or a smartphone or tablet, and few schools are wealthy enough to provide them for their learners. So, digital textbooks could widen the gap between rich and poor. The question is if these new technologies don't include the danger of creating a new social gap between rich parents who can effort individual laptop or tablet and poor parents who have to do it with old printed and dirty handbooks.

Easy working with?

The operation of digital textbooks is surprisingly simple are saying the most textbook publishers. Because the programs are very intuitive, you can use them in a few minutes publishers are telling in their ads. Computer literacy is not necessary! In reality this is not true. Trying out ourselves different systems of digital textbooks learned us that working with these digital materials is less easy as told. Most of the publishers are using their own system of opening and working with the online textbooks and textbooks of different publishers are not interchangeable. Additionally, many different electronic formats are available, which can cause consumer confusion and lead to technical difficulties. So if the teacher wants to change publisher, he and his learners has to get used to other systems all the time. In case of new e-devices: not every teacher and learner has enough background to work with the technology.

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Instead of writing down with a pen, now the learner has to tap on the keyboard, wrap on the screen, etc. Not every learner and teacher has the capacity to learn and do this.

Danger of quality of the textbooks

Whenever it comes, the online onslaught, and the competition from open-source materials, poses a real threat to textbook publishers. Digital materials are easier to copy, to multiply and to share. Students can illegally download and share books as has been done with music. Publishers are paying lots of money in developing their materials and have to invest now also much in protecting their resources. Developing good quality online courses is expensive and demands lots of wages for the makers. There is not only the risk for the publishers to loose copyright money but because everybody can make online digital textbooks, so called freeware, there is a danger that the quality of these free books is worse with even mistakes or incorrect information. But because they are free of charge they are nevertheless used. The move to open-source materials is not by definition negative if quality stays the standard. Maybe it may be accelerated by education policy makers in the future. If schools have to decide between expensive textbooks from publishers or free stuff, maybe the last one is favorable but quality is not always guaranteed.

Conclusion

Technology provides an increase of learning possibilities for teachers and learners much more than can be accomplished through conventional learning means. Digital textbooks are only the start of the revolution in educational technology. Students learn the same concepts, but in a different way. The time that is saved by using electronic materials can be spending to help the learners with specific needs or to improve the learning process. Most of the publishers believe that the world is going digital, but they don't know how this will evolve at this moment. They are agnostic, so they provide digital, they provide print, and they will see what the customers want. Many people wonder if digitized textbooks are an improvement over traditional course books or if they damper the learning experience. The usefulness of a digital text depends on how you look at it. There are many advantages and disadvantages to using digital textbooks. Students accustomed to traditional textbooks typically have to work hard to adjust to this new format, but there is also certain attraction to being able to instantly obtain your textbook with a quick download.

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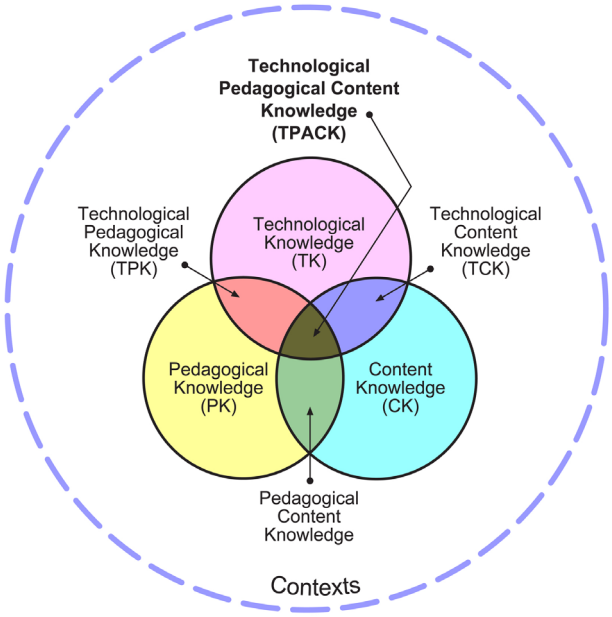

Figure 1.

Essential for textbook publishers is to listen to the experiences of teachers and learners and do research about it, what is missing nowadays. In addition to making devices and content available, providing a user experience that engages teachers and learners is critical to the success of digital textbooks. This is a challenge for educators, not only for the commercial publishing companies.

We suggest working with the TPaCK model in decision making. Analyzing all issues viewing the TPACK-model (or Technological Pedagogical Content Knowledge) is essential in considering of integration of new technology. It's the framework for understanding technology integration for education. This means that you have to think about three important knowledge's. The Technological knowledge is how to use the new media, the Pedagogical knowledge is how to teach and the Content knowledge is the nature of the content that you have to teach. The most important issue is to combine and balance those 3 into perfect harmony.

To make a good decision between a hardcopy book and the digital textbook equivalent the teacher should find and evaluate several e-book publishers before making a deal considering the three points of view.

A flashy website does not guarantee a great publisher and good digital textbooks. Look and compare hardcopy and e-books and see what fits the best. There are many good reasons why digital textbooks are useful, but there are an equal number of reasons why they are ineffectual. For most it's simply a matter of personal preference.

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ENTREPRENEURSHIP & INNOVATION IN THE BATTLEGROUND: NOVEL APPROACHES FOR THE CONTINUING PROFESSIONAL DEVELOPMENT OF TEACHERS IN EUROPE

M. Begoña Arenas, Scienter España, Ivan Diego, Valnalon, Spain, Sophia Protopapa, OLN Learning, Greece

Introduction

ET 2020 strategy recognizes that knowledge, and the innovation it sparks, are the EU's most valuable assets, particularly in light of increasing global competition. In this frame high-quality pre-primary, primary, secondary, higher and vocational education and training are fundamental to Europe's success. However, in a rapidly changing world, **lifelong learning needs to be a priority – it is the key to employment**, economic success and allowing people to participate fully in society.

This is the latest of a number of policy documents and recommendations advocating the spirit of promoting entrepreneurship and innovation in education. There is therefore a **strong need to go beyond theory** and give specific examples of how to promote entrepreneurship and Innovation in the classroom (Ruskovaara & Ikävalko, 2007).

"T*eachers are a critical factor for change among students*" (Arbel, Dor, Weiss, Peffers, 2001), but too often bear the brunt of translating policy into practice. Seikkula Leino (2007) noted the teachers do not know enough about the objectives, content and methods of work for the promotion of entrepreneurship and innovation in the classroom. In the best case, they know what to implement, but not how, and it's no surprise that they feel often stranded.

2 novel approaches for the Continuing Professional Development of teachers in Europe

Both the mENTERing and ADEPTT projects are designing and testing novel approaches to provide teachers and VET trainers with the necessary tools to operate on their 'battlefields', the classrooms.

mENTERing (http://mentering.eu) is testing a sustainable **blended train-the-trainer course on mentoring skills and competencies for VET trainers** especially designed to encourage entrepreneurship while contributing to the cooperation between VET institutions, trainers, mentors, and stakeholders. The pilots are running in Bulgaria and Greece with the

participation of 20 VET trainers in each country. Its learning methodologies include self-learning, face to face learning, webinars and action learning (for those VET trainers already mentoring students).By doing this, mENTERing supports the modernisation of VET practices and systems and promotes a blended lifelong learning approach.

ADEPTT (http://www.adeptt.eu) is testing a **training model based on strategies to promote entrepreneurship and novel approaches for learning in the classroom** as a means to develop not only the ability of trainers but also entrepreneurial mindsets among young Europeans and thus promote socio -local and regional economic development. The pilots are running in Iceland, Portugal, Spain, Norway, Flanders and Wales. ADEPTT teacher training module aims at boosting teachers' confidence to adopt more innovative and enterprising behaviour through a personalized and self-guided process that builds on enterprising elements already present in their teaching.

The combined results of both projects have the potential to become a clearinghouse for knowledge generation regarding novel approaches to support the challenge Europe has to face in order to adapt the Continuing Professional Development of the EU teachers and VET trainers to reality.

Acknowledgements

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NEGATIVE EXPERIENCES ON SOCIAL MEDIA AND THE ROLE OF TEACHER EDUCATION IN ETHICS

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Introduction

The aim of this paper is to present a study that examined the role of teacher education and specifically whether the ethics training is perceived as adequate in relation to how preservice teachers (n=475) evaluate negative experiences on social media.

Background

From a Governmental perspective, the Norwegian education system aspired to be among the best in the world in relation to the development and use of Information and Communication Technologies (ICT) in teaching and learning (Utdannings- og forskningsdepartementet, 2004). Another political document Whitepaper 44 makes strong arguments for social networking sites (SNS) to be utilised as a support for learning (St.meld.nr. 44., 2009). Social Networking Site (SNS) usage is high in the Norwegian population as well as among pupils and preservice teachers (Helleve, Almås & Bjørkelo, submitted; Krumsvik, Ludvigsen & Urke, 2011; Vaage, 2011). In addition, how these three groups behave and the experiences they have on SNS can all be related to ethical dilemmas. The introduction of SNS as a tool for learning is an ongoing process. In the process of transforming curriculum and technology into actual practice, studies have shown that teachers' reflections include both conscious and unconscious ethical dilemmas that are guided and ruled by personal attitudes, values and feelings (Helleve, 2010). As teachers' attitudes, values and desire for change are decisive for how curriculum is transformed into practice (Almås, 2009), teacher education is of great importance.

Professional teachers are role models in the application of information and communication technologies (ICT) as well as in the use of social media in an ethical manner for their students. It is documented that preservice teachers apply SNS both in private and educational settings (Helleve et al., submitted; Morris, Watt & Richardson, 2012). Few if any studies have investigated the role of ethics education among preservice teacher and their actual, including negative, SNS experiences. The aim of the paper is therefore to investigate the role of teacher education and specifically whether the ethics training provided is perceived as adequate and how this training is related to how preservice teachers evaluate negative experiences on social media.

Theoretical framework

Professional teachers are role models in the application of information and communication technologies (ICT) as well as in the use of social media in an ethical manner for their students. Some argue that teachers should be cautious with their use of Facebook as an informal channel (Selwyn, 2010). It has also been found that there are may be a negative relationship between pupils' use of Facebook and their academic performance (Kirschener & Karpinski, 2010). On the other hand have others found pupils to become more motivated when teachers present information about themselves (Mazer, Murphy & Simonds, 2007), even though others also argue that ethical challenges may be are different in SNS than in face-to-face communication (Ess, 2009). Some studies have also shown how students evaluate the participation of teachers in social media and how this relates to the students level of motivation, affective learning and their quality of their classroom climate (see e.g., Mazer, Murphy & Simonds, 2009).

One theoretical model that specifically relates to ethics and teacher education is the "model of ethical dilemmas in teaching" by Shapiro and Stefkovich (2011). The model can be illustrated by six circles (see Figure 1) with the area of "Best interest of the student" in the middle, as were the best interest of the student the centre of a flower and the five other areas its leaves. According to Shapiro and Stefkovich (2011) the circles indicate major factors that converge to create the professional paradigm. The five areas that surround the best interest of the student are (1) Personal Codes of Ethics, which describe ethical codes based on persons' background, life stories and critical incidents, (2) Individual Professional Codes, which describe ethical codes based on the experiences and expectations of the person in questions working lives as well as a consideration of his or her personal codes. Individual Professional Codes includes reflections upon concepts such as what he or she perceive to be good or bad and right or wrong, who he or she are as professionals and as human beings, how he or she make decisions, and why he or she make the decisions they do. Circle three (3, Standards of the Profession), symbolise a professional code, which in teaching is focused on the student. These can vary between professions. Circle four (4, Professional Code of Ethics) describe how codes cannot be separated from a person's personal codes of ethics. This circle takes influencing factors into consideration. For leaders as well as teachers this implies considering various ethical models and the integration of these with the ethics of justice, care and critique. The fifth circle (5, Ethics of the Community) concerns how teachers are part of different communities such as for instance their professional community, their workplace, the schools community and the community in which the teacher works. The ethics of the community can influence the interpretation of ethical and unethical behaviour, as this can vary from one community to another and is not only a matter of personal preferences. Other factors that play a part in the professional paradigm surround the best interests of the student and are such as (A) clashing codes, (B) professional judgement and (C) professional decision making (Shapiro & Stefkovich, 2011).

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Figure 1. Model by Shapiro and Stefkovich (2011). Frontcover from their book "Ethical leadership and decision making in education: Applying theoretical perspectives to complex dilemma"

The assumption of the model is that there are different areas of ethics. One of them is the professional arena. If teacher training in ethics is perceived by preservice teachers as having no impact, do these preservice teachers experience similar and evaluate their negative experiences similar to preservice teachers that experience that teachers training in ethics has been adequate?

The research question in this paper is: If teacher training in ethics is perceived by preservice teachers as having no impact, do these preservice teachers experience similar and evaluate their negative experiences similar to preservice teachers that experience that teachers training in ethics has been adequate?

Methodology

Procedure

Data from preservice secondary teachers in their third and fourth years of study and students enrolled in the program for Post Graduate Certificate in Education (PGCE) were collected from six teacher education institutions located in the north, middle and eastern parts of Norway during 2011 (Helleve et al., submitted). The teacher education institutions were approached through gate keepers (i.e., personnel that the researchers already knew within each institution). Questionnaires were distributed and filled out before, during breaks or following a plenary lecture, with an across site response rate of 80 per cent (N=475). The study was approved by the Norwegian Social Science Data Services (NSD).

Sample

The mean age in the preservice teacher sample was 30 (SD =8.2, n = 438) and 64 per cent of the sample were female. The majority (95 %, n = 447/473) of the respondents speak Norwegian at home.

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Questionnaire

The original Australian version of the questionnaire was developed in cooperation with Morris (2010) and consisted of five parts (Helleve et al., submitted) that covered: (A) Demographic information, (B) Experiences of participants that are on social networks, (C) Experiences of participants that not are on social networks, (D) Experiences of only participants that are on the social network Facebook, and (E) Evaluations of the appropriateness of a variety of potential interactions and behaviours (the Professional Interactions and Behaviours Scale, PIBS) (Morris, Watt & Richardson, 2011; Morris et al., 2012). The Norwegian version of the questionnaire consisted of the six parts, parts A-E of the Australian version in addition to part F that investigated the participants' personal experiences with SNS in teaching (Helleve et al., submitted). Part F included questions about SNS in teaching within the participants' teacher education institution as well as questions about SNS in teaching within their practicum classes and schools. The questionnaire consisted of open and closed response categories and was tested on relevant personnel before the study was launched.

Results and discussion

The presentation will present some preliminary findings and discuss the theoretical and educational significance of these.

Do pre-service teachers evaluate negative behaviours differently depending on whether the ethics training in teacher education is perceived as adequate in relation to their later professional life as teachers? A total number of 461 (97 %, N=475) of the participants had responded to the question regarding how adequately their current degree had prepared them to deal with ethical issues in the teaching profession?

Based on the 261 responses, we grouped the participants into two groups. Group 1 consisted of the participants that reported that their current degree not at all or to somewhat adequately had prepared them to deal with ethical issues in the teaching profession, while participants that reported that their current degree moderately or very much so had prepared them to deal with ethical issues in the teaching profession were Group 2.

The relationship between the understanding of ethics in negative experiences on social media and ethic training data will be connected to the different parts of the theoretical model by Shapiro and Stefkovich. The discussion may call for thoughtful, complex thinking and help students and teacher educators come to grips with their own ethical codes and apply them to practical situations.

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EDUCATIONPLAZA – TEACHERS' PROFESSIONAL DEVELOPMENT

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Introduction

New skills and literacies are needed in education to meet the challenges of rapid technological change. Existing models of in-service training for teachers do not provide an adequate means of re-skilling teachers in a timely enough manner to address these challenges. In this study we explore the professional development of teachers working in communities of practice that make extensive use of social media and digital habitats to create dynamic learning environments. As online habitats for communities of practice have grown in popularity, facilitators and "stewards" are faced with the complicated task of choosing appropriate tools and methods to support formal and informal learning objectives. Of particular concern is how to appropriately implement and use available technologies to support learning and promote community-wide participation and engagement. Although several previous studies have addressed these and related issues, there is a need for a continuous effort due to the constantly changing nature of technology and its possible uses for supporting lifelong learning and professional development. This study focuses on the construction of four networking communities of practice for teaching and learning and how they are sustained. The communities are maintained under the umbrella of MenntaMiðja (Education Plaza), hosted at the University of Iceland School of Education, which opened formally in October 2012. The Education Plaza is intended to provide a framework for multiple communities of teachers, helping them to identify common themes and to connect them to other key players, including educational researchers, policy makers and practitioners/professional associations). This study will provide valuable practical and theoretical foundations for emerging dynamic practices relevant to teaching, learning and research using new technologies, social media and networking.

The rapidly changing nature of the Internet and Web 2.0 tools is creating new forms of social interaction and production (e.g. the open-source software development) which require new skills and literacies (see e.g. Guðbjörnsdóttir, 2010). The pronounced rate of change is leaving educational systems and schools lagging far behind changes that are being observed in the labour market and in people's daily lives, as has been the case with waves of technological innovations in the past. The discrepancy between technology use within educational systems and outside of them is a particularly critical issue at this time because of the increasing importance of knowledge intensive work and processes in all societies and for teachers'

education and professional development. This adds a layer of complexity to teachers' ongoing professional development: In addition to having to stay current in content knowledge and didactics, teachers now also have to have an understanding of technology and how it affects learning (see e.g. Schmidt et al., 2009). Furthermore, teachers do not only need knowledge and competence in all three of those areas but also insights and experiences on how they can be effectively intertwined. For example, it is not sufficient that a special education teacher know how to operate a new technology device (e.g. tablet computers such as iPad); she must also know teaching methods that will be effective for certain learners with special educational needs, and know mathematics well. There needs to be an appropriate blend of these three dimensions and with rapid technological change and development of new content knowledge, constant exploration and sharing of information and best practices is needed.

UNESCO has recognized the need to increase media and information literacies among teachers and published policy frameworks and core curriculum for this purpose (Wilson, 2011; UNESCO, 2008). One objective in the Icelandic government's current policy on information and communication technology (ICT), "Iceland the Online State" (Netríkið Ísland), is to expand the number of skilled ICT leaders in schools (Forsætisráðuneyti, Netríkið Ísland, 2008). To meet this objective, the University of Iceland – School of Education (UISE) is working with the Icelandic Ministry of Education, Science and Culture (MESC) to provide increased opportunities for continuous teacher professional development, particularly in the area of ICT. The question arises which methods may be employed for this purpose. We believe that new ways need to be developed placing more emphasis on communities of practice and use of social media. This Education Plaza (Menntamiðja) project has been launched to explore such ideas.

Social networking – communities of practice – digital habitats – online plazas

Educational researchers are increasingly paying attention to social networking as new technologies are influencing how information is created and shared and how people connect and socialize (Siemens & Conole, 2011). Recent studies provide insights into how social networking can impact cooperation, learning and development among students and educators (Bunus, 2010; Mitchell & Watstein, 2007; Green & Bailey, 2010; Guðbjörnsdóttir, 2010; Kirschner & Karpinski, 2010; Shiu et al., 2010; Sigurvinsdóttir & Jakobsdóttir, 2010). A 2011 issue in IRRODL is dedicated to the design and delivery of social networked learning (Siemens & Conole, 2011). The issue also focuses on connectivism, an evolving theory that addresses learning in complex, social, networked environments where knowledge development forms a cycle, starting from an individual with personal knowledge going through a network to an organization and back to the individual, "allowing learners to remain current in their field through the connections they have formed" (Siemens, 2005). "A social network is a social structure made of individuals (or organizations) called 'nodes', which are tied (connected) by one or more specific types of interdependency" (Wikipedia). In his book "From teams to knots", Engeström (2008) presents activity-theoretical studies of collaboration and learning at

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work. Engeström focuses on teams and points out that they are becoming increasingly distributed in space and knowledge and innovation-driven. He introduces the notion of 'knots' or knotworking where collaboration between partners is vital but taking "shape without rigid, predetermined rules or fixed central authority" (2008, p.20).

Social networks have been described as bottom-up, people-centric, user-controlled, context-driven, decentralized and self-organizing with the connections as the main focus (Mayfield, 2005). In contrast, Mayfield claims that a community of practice (CoP) tends to be more top down than social networks – more place-centric, topic-driven, centralized and architected with a focus on content. A CoP shares a common goal which could be supported e.g. with online technologies (Bonk et al., 2004). Wenger, White and Smith (2009) have examined how technology can facilitate community building and vice versa and point out that "technology for community use has become an important area of practice and one that needs to be developed and nurtured to yield its full potential" (Wenger et al., 2009, p.4). They introduce the concept "digital habitat" referring to the part of a community's habitat[1] which is enabled by a configuration of technologies. A growing number of communities have a significant part of or even their entire habitat online. A question arises how such habitats can be architected and what should be the theoretical foundations for its design. Wenger and others have created a CoP focused on CoP's which has its digital habitat in an online "square" – called CP square (http://cpsquare.org). Wenger et al. point out that communities are now facing larger and more complex technology choices for the creation of their digital habitats. They describe the important role of "technology stewards" or "tech stewards" who adopt "a community's perspective to help a community to configure and use technologies to best suit its needs" (2009, p.24). Such people are more insiders of a community than a typical IT support staff member. They scan, try out and choose community technologies and help adapt them to everyday use. Another similar/related role described more recently by the CP Square organization is a community coach. Practical guidelines are provided by Wenger et al. on how to build and cultivate CoP's with the aid of various activities and technological tools depending on the community orientation: Meetings, open-ended conversations, projects, content, access to expertise, relationships, individual participation, community cultivation, and serving a context. Conole, Galley and Culver (2011) presented a case study of a social networking site, Cloudworks designed to promote academic practice. They applied design-based research and studied emergent patterns of user behaviours. The site was used in several ways. Some can be aligned with the orientations provided by Wenger et al.: Events/conferences (~meetings), expert elicitation and consultation (~access to expertise); resource aggregation (~content). However, additional ways were academic in nature and included debates, reviews, courses, and reading circles.

Professional development of teachers is an important educational issue and closely related to school effectiveness and education reform. Research has shown the important role that collaboration and professional interaction between teachers plays in their personal development and professional satisfaction (Bandura, 1997; Musanti & Pence, 2010) as well as for improving school effectiveness (Sigurðardóttir, 2010). Active CoP's provide teachers with

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support and encouragement for trying out new ideas and help boost their confidence (Lieberman & Miller, 1999; Ingvarsdóttir, 2006; Fullan, 2001). However, many teachers are often not aware of professional development opportunities and have limited possibilities for professional interaction and networking with other teachers. Geographical isolation is e.g. a factor in Iceland in regard to professional development and interaction. It is difficult for teachers from small schools and distant areas to participate in training workshops and professional meetings which are generally held in the capital area (Ragnarsdóttir et al., 2008).

Jakobsdóttir, McKeown and Hoven (2010) have described how teachers can use ICT and new information and communication technologies for their continuing professional development as they are becoming more familiar with social networking tools and aware of the communities to which they have access and can contribute. However, few Icelandic educational researchers have paid attention to community building online. Jakobsdóttir (2002) described tools and methods in a blended environment to create a learning community of graduate students studying ICT and media in education. An early method for networking was using a postlist, to which student cohorts were added and where they remained as members after graduation. Communication was mostly one-way with information sent out about events and opportunities or requests for participation in surveys. A few years ago a web was set up sponsored by RANNUM (Centre for Educational Research on ICT and Media which is headed by the prime investigator in this application) employing NING (http://utmidlun.ning.com) to facilitate social networking and community building for teachers, researchers and students of ICT and media in education. However, as Conole et al. describe in their study, it is a challenge for a CoP to grow the number of core contributors and include activities that foster use and engagement. This is the experience of several members of RANNUM who have been active in promoting the uses of wikis and social media in education. However, recent examples indicate how useful social media can be to learn about new technological developments and their relevance for education. This spring a group of three graduate students taking a course module organised by the primary investigator in this proposal started a Facebook group focusing on the use of tablet computers in education. A few weeks later over 400 teachers and educators across Iceland had signed up for the group and have engaged in lively and rich discussions and information-sharing. Since the group started and at the time that this is written, the number of participants is over 1300.

Language Plaza (LP), Science Plaza (SP), Special Education Plaza (SEP)

Three projects- plazas participate in the current study:

1. *The Language Plaza (LP) – Tungumálatorg.* (http://tungumalatorg.is) With the support of the Ministry of Education, Science & Culture (MESC) in Iceland and funding from various Icelandic, Danish and Nordic agencies, LP was formally opened on November 16, 2010 (version 1.0). The LP is an online community supporting language teaching and learning in Iceland. It provides useful, relevant information for teachers and parents, and there is an emphasis on creating and supporting a community of teachers

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and parents to exchange ideas, opinions and experience to learn from each other. The intellectual properties are published under the licenses of Creative Commons and the community is open to everyone. The LP has received funding and support from several sources. Currently a contract has been made for operation, support and funding from the Local Authorities' Equalization Fund (Jöfnunarsjóður), University of Iceland – School of Education (UISE) and Reykjavík municipality. Þorbjörg Þorsteinsdóttir is the tech steward of the LP.

2. *The Science Plaza (SP) - Náttúrutorg.* (http://natturutorg.is) Science Plaza is a project which was inspired by the Language Plaza and is being developed to meet needs for more cooperation amongst science teachers, expressed in Svava Pétursdóttir's thesis[2], but Svava is the tech steward for the SP. The project received funding in 2011 from the Fund for Educational Innovation and Development (Sprotasjóður) and The Palmi Jónsson Nature Protection Fund (Náttúruverndar-sjóður Pálma Jónssonar). The aim of the SP is to provide opportunities for sharing teaching ideas and resources through an online community of practice, alongside physical meetings. A further aim is to develop participant pedagogical content knowledge, empowering teachers towards more varied teaching methods, increased practical work and use of ICT in science teaching.
3. *Special Education Plaza (SEP) – Sérkennslutorg.* Inspired by the two earlier plazas, plans were made to create a Special Education Plaza (SEP) with the main purpose to strengthen the society of special teachers in the country. Hanna Rún Eiríksdóttir has worked closely with the leaders of the LP and SP under their guidance as well as from the project leader Sólveig Jakobsdóttir. The project received funding from Fund for Educational Innovation and Development in 2012 to develop the SEP. Through the project website (http://serkennslutorg.is), SEP can communicate information regarding teaching special needs students, including teaching methods and teaching materials. SEP can be a forum for exchanging views and advice about practical methods and materials that have proven their merits in connection with teaching special needs children. It will be attempted to enhance the cooperation of teachers by enabling them to communicate their experience. SEP is designed to be useful for all school staff members who are involved in the teaching students that have special needs or are disabled in various ways.

These are the first three plazas and more are in the making, including an ICT plaza, an Extracurricular Activities Plaza and a Mathematics Plaza. They provide online venues and support and facilitate CoP's for teachers to share their ideas with colleagues and interact professionally. Teachers who are geographically and professionally isolated can access information more easily and interact with a wider community of teachers. This kind of collaboration is self-initiated, bottom-up and user-generated, but is supported by current public policy and the government. It provides teachers with new knowledge and professional support which can further their personal and professional development. Through the plazas, teachers can find new teaching ideas and share their own ideas and experiences with others. They can pose questions and discuss issues of concern with colleagues and can do so irrespective of time or space (an example of how technology can facilitate community

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building). The opportunities for professional development via the plazas differ from the traditional professional development approaches which rely on the short-term transmission model, such as summer workshops or one-off in-service meetings. The plazas allow for on-going collaboration which is closely linked to the school context and, as such, they extend professional learning communities. Teachers can implement new ideas in their teaching and discuss the outcomes with colleagues when it best suits them. The development and positive progress has caught the attention of UISE which saw the potential of linking it more strongly with teacher education and research & development. As a result, a formal collaboration is being formed to provide a framework for these initiatives.

Education Plaza – Menntamiðja

MenntaMiðja or EducationPlaza is a collaboration venue, which is meant to build bridges between actors in the education community and facilitate cooperation in school development. The aim is to formalise grassroots projects that have emerged in connection to LP, SP, SEP and other similar projects.

Different plazas or portals around certain areas of education are the basic units of MenntaMiðja and where the core activities take place (see Figure 1).

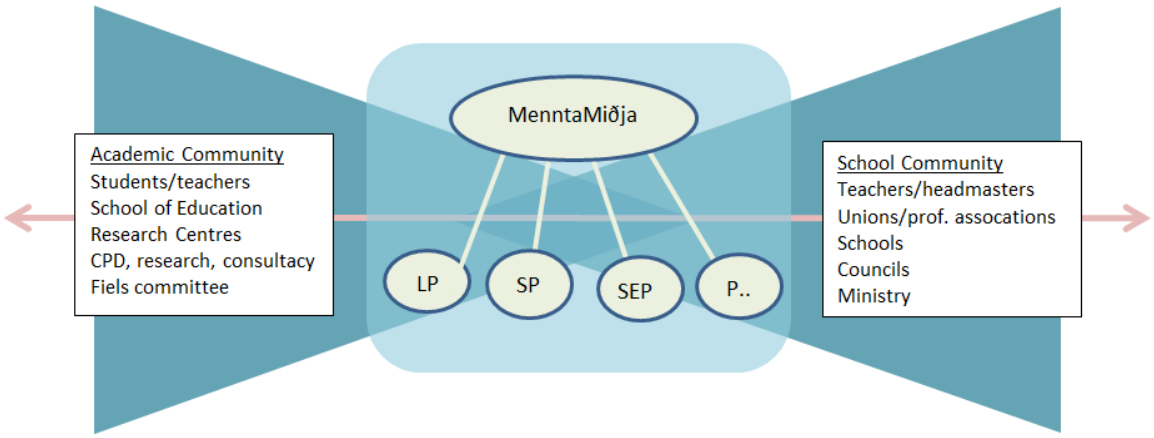

Figure 1. Overview of Education Plaza (Menntamiðja)

Its role is to provide a framework for the different activities within the plazas; to open up, facilitate and develop channels of communication for sharing of information; provide consultation on research and school development projects; facilitates requests for cooperation; and to connect the different activities and functions of actors in the school- and academic communities.

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Objectives of the study

This study was started in the fall of 2012. Through a five year period we plan to record, evaluate and monitor the progress towards the following objectives:

Education Plaza – Menntamiðja – objectives:

- Facilitate the creation and sustainability of communities of teachers with the purpose of strengthening professional development particularly in the areas of new media literacies and technologies.
- Strengthen internal links between community members and to other individual and associated networks, facilitate formation of teams or "knots" of collaborating members, strengthen communication and collaboration and facilitate sharing of information and knowledge building.
- Build bridges between key players within the Icelandic education system regarding teacher education, schools, educational research centres and policy making institutions (government, national, municipalities).
- Explore the use of new virtual environments, tools and technologies.
- Explore how teachers can improve their digital competences through social learning networks.

Each plaza – specific objectives/questions:

- What lessons can tech stewards/community coaches learn about community building from collaborating with others and how can they facilitate, support and improve the communities involved?
- How does the effect of active technology stewarding affect community participation and learning?
- Which orientations of CoPs (Wenger, et al, 2009) contribute the most to different CoPs.
- How can the experience of building and sustaining different CoPs be transferred to other CoPs?

Method

In the study involving the Education Plaza an action research is employed, in which there is an emphasis on intervening in your own practice to bring about improvement (McNiff et al., 1996). The researchers have digital habitats that they want to prepare, test, and/or develop effectively, aligning them with the needs of the professional communities to which they are linked (see an overview in Table 1).

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Table 1: Overview of research methods.

Study	Design. Participants -Main group	Data - Procedure
EP	Action research Leaders and/or key players concerning the development of the EP Active members of at least 4 CoP's in a technology steward /community coach role Users/participants of evolving networks	Preparation: course on CPSquare course online (fall 2011, leadership workshops fall 2012) and leadership workshop (October 2012), development of digital habitat for the project Bi-monthly meetings for sharing information and developing further actions; Mapping of networks, initial and bi-annually Checklists -progress , user surveys and web statistics; "Tool chest" with information about technological solutions Progress evaluation – reports/blogs/online journals Educamp workshop(s), presentations and publications
Plazas	Design-based research (Mixed method) Tech stewards/community coaches Teachers	Qualitative methods: In-depth interviews and focus group interviews, text analysis (meeting minutes, data collected from workgroups, e-mail and web-pages), and research journal of the tech steward/action researcher. Quantitative methods: Social network analysis, online surveys, web site traffic. ICT competences assessment (self-assessment, via surveys) Done in connection w. continued development of the sites which can include main webs such as Wordpress, WikiSpaces and social networking sites/groups including Facebook or Ning.

Pilot evaluations and Discussion

This project is still in its first phase and current results limited to formative evaluations of practice. The results here are from the first phase of pilot evaluations.

The preparation phase of the project included the CPSquare course and a leadership workshop that resulted in a shared understanding of the theory and ideology underlying communities of practice. The leadership workshop brought together a range of actors in a dialogue about communities of practice (CoP) and training for current and future stewards of CoPs. The EP was formally founded immediately following the CPSquare course and workshop and a project manager has been hired.

One of the primary aims of the Educational plaza is to promote and facilitate the establishment of new communities of educators. Development of a digital habitat for the project was started in the fall. The tools are still under development. A website has been set up to serve as a hub for sharing news and information. The project has been promoted in presentations and workshops as widely as possible within the educational community. As a result of publicity of the establishment of the EP, stakeholders of other curricular content areas and educational interest groups have approached the steering group for advice and inspiration. They have been directed to experienced community members depending on their

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needs. Communities have begun to form around various interest areas including, ICT in education, the "flipped classroom", mathematics, and extracurricular activities. These groups are in the process of evaluating digital tools and negotiating the landscape of CoPs to strengthen their professional interests.

The technology stewards report that having the backing from EP has facilitated the formation of "knots" and helped participants to identify sources of funding applications for a range of projects, strengthened links to the networks behind EP, and leading led to fruitful collaboration in providing both online and real- time professional training. The technology stewards of LP, SEP and SP have collaborated both online and in a Facebook group. Their collaboration has brought about a wide range of benefits. Their consensus after these months is that the collaboration has lessened feelings of isolation, being able to share good practice, tools and professional support. Sharing resources, insights and knowledge has made facilitating communities more efficient. Presenting work collaboratively has raised visibility and awareness of the projects in the educational community. The model seems to show considerable promise as a support structure for grassroots initiatives and will form the basis for supporting new communities of educators.

The current plazas differ in terms of their structure and orientations. The tech stewards of the plazas have experimented with ways of evaluating their activities aligned with their practice. The LP website has many strands linked to training, meetings and projects. There is, however, only a loosely connected online community but a larger face-to-face network of actors from different institutions. The evaluation of this broad project is fragmented around the different strands. There is still clear evidence of successful examples of bridge-building where actors from various institutions have used the project to collaborate and share knowledge and experience. An example is a trainee teacher who completed her training with the technology steward, bringing new methods and tools into schools. Teachers in the school were quite taken with the trainee's input and the tutor from the university persuaded the trainee, who was final year, to train a group of first year trainees. SEP is currently focused around content aggregation and publication and has not undergone systematic evaluation yet. In this paper the evaluation of the science plaza is presented, but the evaluation of the SP is supposed to pilot practices for all the plazas and future projects.

The SP has been active for over a year and after that year the activity and usefulness of the community was evaluated with a survey, a focus group and an analysis of online activity. The SP community is focused mainly around three activities with several orientations, meetings, content aggregation and community building. Meetings and an online Facebook community give access to expertise and support community building. Content aggregation takes place in both venues and is collected and published through the community website. To begin with, inset training was organised in one area. The participants were invited to participate in a Facebook group and encouraged to invite others who might be interested. With this snowballing method, the number of members grew to 108 over a year. The membership rose with increased publicity to over 150 members. First the members were mostly lower-secondary science teachers but soon university lecturers joined and their students, along with

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upper-secondary teachers. This variety in membership has led to fruitful exchanges of ideas and resources.

Contributions to the Facebook group were counted by hand, entered into a spread sheet, counted and categorised. The community has been active over the evaluated period, members posted 226 times, 103 of the posts were "liked" 251 times. Activity peaked at the start and end of semesters but dropped significantly during the summer holidays. A core group of active members are responsible for most of the activity, but a survey revealed that even though a large cohort does not have visible activity, they monitor contributions closely (see Table 2). Of 30 respondents to a survey 48 % said they visited the group every time they saw new activity there, 24 % said they visited the group 2-5 times a week, and a further 28 % visit the group weekly. Focus group with 9 members revealed that members value the group and find it useful even though they do not contribute. This suggests that the community is bringing together different actors, a core group of teachers that have expertise to contribute, and a peripheral group of teachers looking for learning opportunities and expert knowledge.

The contributions to the Facebook group were of a wide variety including, asking for advice or provoking discussions about teaching practices and practical work, sharing links to online resources, advertising or reminding peers of available training and courses.

Facebook groups may be user-friendly but quantitative evaluation of activity in the group proved to be laborious and the usefulness of the data gathered is in our opinion questionable. Showing evidence of good practices and successful learning may prove to be more useful in community development, exploring what in the practice of the community brought it about. This will be an on-going quest in these projects.

The work so far has promising indicators and the intention is to support upcoming teacher communities and optimising the use of available funds for the support of teachers leading to the ultimate goal of more equal and effective education for our pupils.

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THE TEACHER AND THE PUPIL: JOYS OF COMMUNICATION

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A new primary school standard was adopted by the Ministry of Justice of Russia on 22 December 2009, and came into force countrywide on 1 September 2011. A school's failing to follow the standard (not working within technology-rich environment, for example) may lead to a civil fine. According to Labour Law amendments, a teacher can be fired due to repeated professional fault over the school year.

Now there are a few words about the "carrots" in educational policy. There are a number of professional contests with substantial money prizes for individual teachers and schools. There is also a system of continuing teacher professional development in operation. Fostering teacher education by the new standards' propagators and advocates provided a powerful impetus. The system was tested and approved by pioneer city schools, which resulted in a base of exercises and software instruction and possibility for copying the models of the courses for teachers. Today teachers and school administrators are trained within district training programs; the implementation of new federal educational standards (GEF DOE) is monitored on a regular basis. The project might seem too good to face any problem; however, the picture will be incomplete without a number of factors.

To begin with, in former times education and upbringing were part and parcel of the family. The love for work and the habit of overcoming life and emotional difficulties were inculcated in peasant children while priests took the role of the psychologist. The person lived in a close-knit circle with values transmitted from one generation to the next. With the advent of industrial society, a child no longer was in the bosom of the family, and nowadays we witness different organizations and their staff assuming the role of parents who are constantly at work while children are trying to satisfy their thirst for emotional interaction outside the family. A child is influenced by commercials and soap operas promoting "good life" and easy money, violence, and other evil and destructive ways of living. Teachers are responsible for the instilling of vitally important values into the children. The school psychologist M.S. Rasnicina says, "The experiment based on Jacob L. Moreno sociometric method carried out in school №169 showed that the character of the pupils is shaped in grades 1-5 under the influence of the teacher who unconsciously treats them according to certain criteria: passive or active, accurate or quick, creative or following the examples, maintaining mercenary attitude, respecting authority; gender relations and relationships with parents. The children whose conduct corresponds to "good behaviour" turn out the teacher's pets, while others become "outcasts". It follows that the success of a child's adaptation to the class environment highly

depends on how well his family values conform to those of his first teacher (Rasnitsyna, 2012). In this respect the teacher's values and knowledge are of paramount importance when we speak of innovation.

Is becoming a learner a psychological handicap for the teacher? Teachers attending professional training can be roughly divided into 3 groups: ready and able to embrace new ideas; having psychological difficulty; strongly opposing any innovation and suggesting 101 reasons for discontent. The teacher's age has nothing to do with it. The polar opposites are: the 1st group was quite easy to work with; the 3rd group showed implicit or explicit hostility because of the poor information and practice they had. In other words, there is a large discrepancy between the modern requirements and what teachers actually consider "correct".

Teaching Russian or Computer Science is not that hard, teachers start to have problems when it comes to infusing ICTs into their teaching. Teachers' unwillingness to make innovative use of technology can be explained by their simply dreading changing classroom activities, using computer or ICTs' undermining class discipline. Moreover, stressful situations can be caused by the burden of material responsibility for the expensive equipment, the lack of technical help, or insufficient organizational skills.

Teacher's persisting in the subject-object interaction model (knowledge, skills and abilities) leads to the escape from reality.

ICTs broaden the possibilities for the teacher and the pupils (Starikova & Ladina, 2012):

- Children get more motivated and are eager to study in the technology-rich environment;
- The forms of educational activities are rapidly changing; the 1-2 grade Health Regulations 2.4.2.2821-10 set 10 and 15 minutes limits for viewing static images on a whiteboard and images on an individual computer respectively.
- A child can take time doing the work, while the ordinary organization of classroom activities does not permit flexible time regulation;
- ICT-enabled educational environment allows to see immediately who is through with a task rather than wait for the end of the lesson and therefore better control the classroom activities;
- There is no need in drawing up pupils' achievement report at the end of the lesson or the school year as it is already done.

It is important that ICTs become value for teachers, which is possible to achieve if only teachers start to enjoy using new technologies. Taking into account the fact that methods for teaching adults and children are much alike, the learners' fear can be dispelled by:

1. remaining calm and confident regardless of all criticism the innovation raises;
2. being friendly to everyone;
3. analyzing a learner's results rather than levelling criticism;

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4. providing an ongoing support for learners.

This is not enough, however – there is post-non-classical pedagogy vocabulary most teachers are still unfamiliar with. Another problem is to inspire a teacher to make a socially important theoretical project which the teacher has never done before. How a teacher with no team-building experience can encourage various forms of classroom activities?

The tasks are usually modelled on feasible examples and come with detailed instructions. Still, negligent teachers tend to forget everything after the tasks are completed and examinations passed. They are inventing new formal ways to prove they meet the federal standards for fear of being monitored. When training the teachers in Western Administrative Okrug we have created a networking project based on the city web portal (LMS Moodle) and aimed at those teachers who worked in that part of Moscow. We were guided by "Utchimsya igraya" by V.V. Volina (published in 1994). The book contains exercises and tasks, proverbs and sayings, and funny fairy stories. The first part includes alphabet learning methods many primary school teachers may find workable; the second part offers a number of lesson plans.

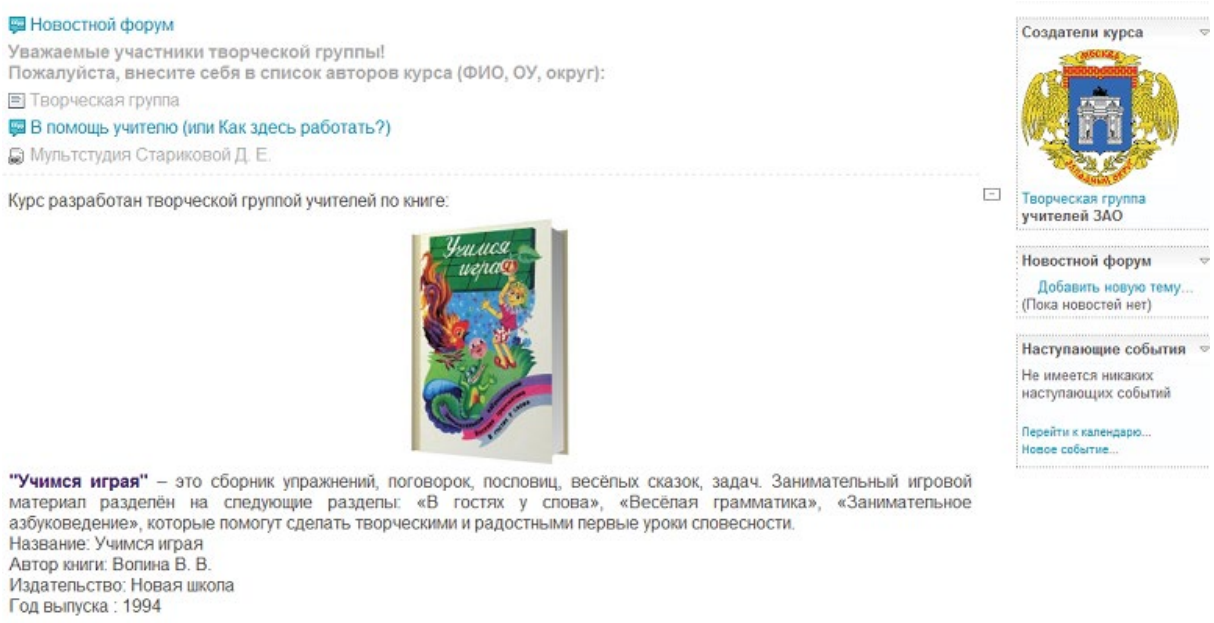

Figure 1.

The technical side of the project:

- any teacher enrolled on courses can make changes,
- it is possible to acquire a course, wholly or partly.

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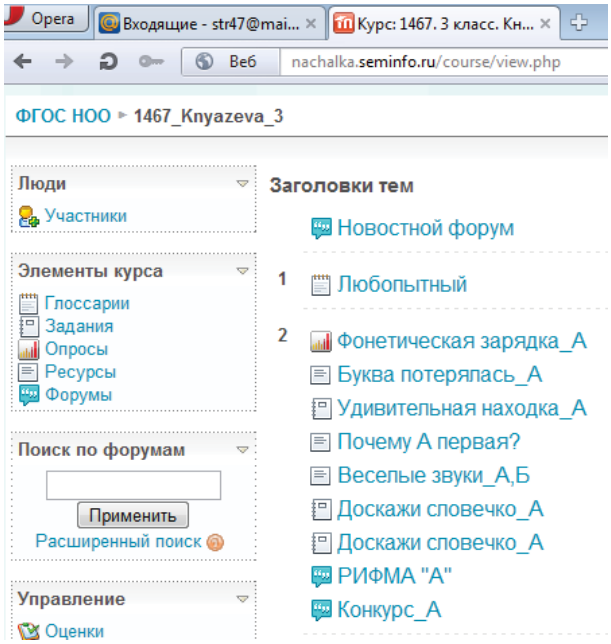

Figure 2.

Each time we use a new set of tasks to better respond to concrete challenges (at teachers' request). Our goal is to maintain the level of technical requirements for a task. During the lesson we employ several different activities and it is always hard to adapt the tasks for changing audience, and working on it is always a brainstorming session.

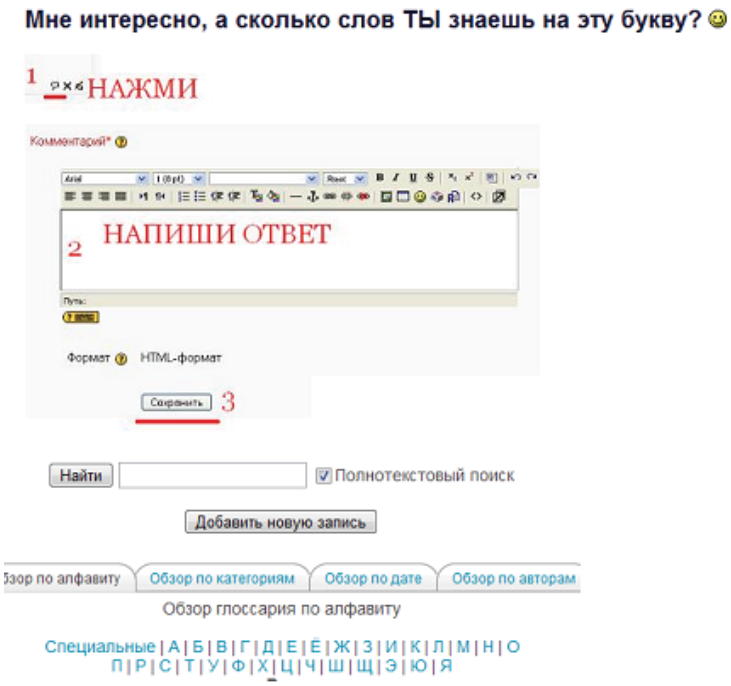

Figure 3.

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Here is a SWOT analysis:

Strengths:

- Teacher considers himself part of a tight-knit team;
- Teacher no longer feels alone in the face of an overwhelming task;
- Creating a worksheet for 1 letter automatically gets us a ready set of alphabet exercises;
- Variety of activities give the teachers rest breaks;
- Reaping the rewards of their own hard work is especially appreciated;
- Boosting one's self-esteem;
- All psychological barriers removed, the teachers start to enjoy the job.

Weaknesses:

- Course training presupposes another form of work;
- The amount of time which one has to perform a task is larger;
- For many teachers professional training is merely a formality.

Opportunities:

- Teaching the varied forms of work by living example;
- An opportunity to train any technical skill (tortoise movements in PervoLogo, for instance) before getting a list of commands and procedures;
- A possibility of designing projects to tackle the most challenging topics.

Threats:

- A mismatch between the reporting forms and the amount of work;
- A risk of failing to fulfil a task at once;
- A risk of work overload for teachers.

The ultimate result depends on a teacher trainer's personality – the greater the impetus lent, the more effective the teachers' work becomes and the more they love the teaching profession.

The system can nevertheless be supplemented by some elements – the technical skills might well be accompanied by the courses in project organization (for example, the Intel "Road to Success").

Russian system of education has a rich store of experience and good practices – schools working in the system of intellectual ability-, communication- and activity-based approach or on the theory of inventive problem solving (TIPS), while Intel courses do not focus on the enhancing of intellectual abilities. Trainings, summer schools, conferences can give an excellent chance for fruitful cooperation and experience exchange.

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However, the necessity for teacher communities arises out of the psychological problem, i.e. the teachers' need for support and guidance. Besides supervisors and district-based training centres a school is attached to, we might well organize work teams to facilitate teachers' work.

At the moment there are many courses and forums and professional online communities. The city web portal might also require a customer support service by subjects as every teacher knows better what his or her pupils are good and bad at, and thus can identify the most critical areas. In fact, at an early stage such forum needn't be connected with the curricula.

Here is a listing of works. Since the late December 2012, when the project was set up much has been done thanks to teamwork (Starikova, 2013).

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THE 'GROUPS': A NEW INSTITUTION IN THE GREEK PRIMARY EDUCATION SYSTEM

Stamatia Mantikou, Vasiliki Liakou, Vasiliki Oikonomidou, 2nd Experimental Primary School of Rhodes, Konstantinos Karampelas, Sarantis Karvounidis, University of the Aegean, 2nd Experimental Primary School of Rhodes, Greece

Abstract

This paper is a case study, which aims to examine the progress of a newly established institution in the Greek Education System. This institution is called the 'Groups' and is introduced at primary education level. Within it, teams of pupils, who share an interest to deepen, widen and broaden their skills, knowledge and background in a specific area of study. The context of the paper is a public primary school in the island of Rhodes in Greece, where five kinds of 'Groups' were composed during the academic year 2012-2013. The teachers involved in these, though a case study approach, by examining documents, learners pieces of work, interaction and discussion, try to answer the following questions: 1) What is the current progress of the 'Groups', in the school program? 2) What are the learners' perceptions towards it? 3) What challenges arise? The results show that there can be significant benefits from the 'Groups' both for the learners and the educational organization. However, the wider social and educational context in which the school affects strongly its effectiveness.

Introduction

The 'Groups' as an institution established in the Pilot Schools of Greece in accordance with Article 45 of Law 3699/2011, which "promote subjects such as mathematics, science, language, literature and other fields such as the arts, sport etc., to create nuclei of creativity and excellence that leverage the increased capacity of some students, without compromising their socialization".

According to the theory of multidimensional intelligence-theory of multiple intelligences-developed by Gardner (1983), the main axis of the operation of educational institutions, programs, or activities such as clubs, is to promote skills and talents and the interest of learners. These may relate to skills: linguistic, logical-mathematical, spatial, musical, figural-spatial, bodily-kinetic-and interpersonal communication.

In addition to that, Driver et al (1996) and Campbell (1997) describe that the introduction of such institutions in the broader and wider established curriculum may include actions such as:

planning activities, interdisciplinary and trans-disciplinary approaches, student work (projects), assessments and practical learning exercises.

For this reason, as required by law, the primary process is a form of examination in order to select those learners who are capable and willing to attend the program groups (Wilson & Boldman, 2012).

The identity of the school and the 'Groups'

The second experimental primary school of Rhodes is a public School with 15 teachers and 180 pupils. It is based on the centre of the town of Rhodes, a main sea-side tourist resort, facing various environmental challenges with regards protection of forest, seas, the local flora and fauna, as well as the individual cultural traits. It is this policy-direction, on which plenty of environmental projects have been carried out by the school over the last years, quite successfully. The aim is to keep on similar focus, by adding of course new elements, concepts, practices and values.

In the 2nd Experimental Primary Standard Rhodes during academic year 2012-2013, Groups were introduced. The subjects of these groups are 'Mathematics', 'Environment', 'Reading', 'Information and Communication Technologies' and 'English through E-twinning: Foreign Language and Literature online'.

The Group of Mathematics focuses on the relation between mathematics and sustainable development, as an expansion of the curriculum of Mathematics and other subject. Learners will be taught to identify who to use quantities and compare, plan and do research on several issues. The chapters that will be carried out are: i) Mathematics and Research, ii) Mathematics and Information and Communication Technologies, iii) Mathematics and Economy, ix) Mathematics, Environment and Science, x) Mathematics and Arts. The ultimate aim is to qualify the learners with the skills required to understand the potential of mathematics to understand, investigate and solve problems and other challenges if their everyday life.

The Group 'Environmental issues' is concerned about sustainable development, as an extension of the requirements of the school curriculum subjects. Students will learn about the various dimensions of environmental education, the significance and importance of sustainable development in order to compare, plan, plan on issues relating to human beings, our country and culture, as the experience. This will be made through the broad areas to be developed: i) Children and environmental consciousness, ii) Environment and culture, iii) Renewable energy sources, ix) Environment and tourism, x) Environment and Art. The ultimate aim of the Group is to motivate learners towards firstly environmental issues that concern them and secondly towards wider environmental issues and to see how the knowledge they acquire the skills they develop, helping them to better understand and provide solutions.

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The Group of 'Reading' focuses on introducing the learners with well-known and less well known samples of literature work and the stimulation of their interest with literature, and creativity. The long-term goal is to promote language literacy, the active participation in interpreting and re-constructing book stories as readers or performers, to develop their imagination, critical thinking and observation. The main dimensions are linguistics, cultural and cognitive.

The Groups of 'Information and Communication Technologies' as well as 'English through e-twinning' were focused on the applications of modern technologies and their perception as means to promote learning and self-learning. The former has a rather more general interest whereas the latter specializes in English language literacy. In fact, the later was established not at the initial but at the later stage, due to excessive high demand for the former. Both groups emphasise on aims relevant to technological literacy, social skills and problem solving (2nd Experimental Primary School of Rhodes).

The importance of evaluation

According to Fullan (2001), the implementation of an educational reform of any kind or size, in any educational system can be integrated and sustainable must make a deep impact in the educational system and the educational reality or educational culture society. The essence of the reform must be understood and shared by all members of the learning community. In connection to this issue, Hargreaves and Fink (2000) argue that sustainable change must be extended to three dimensions:

1. It must be deep, which means to be radically changing functions or activities conducted at the school.
2. It needs to have width, to extend that directly or indirectly in many dimensions of school subjects and functions.
3. Finally, it must have length; include a long-term goal and purpose.

These findings make the evaluation of educational innovations or changes as necessary to carry out any conclusion or generalization about the usefulness or viability of each change.

A form of assessment that can be applied to help further improve and deepen the functioning of groups is self-assessment.

According to the law 3966, the basic criterion of evaluation does not cease to be the primary aim set and the legal framework around which moves the group. Criterion is also the overall educational process, participation, the attendance of students, educational activities and teaching aids. Finally, the basic identity of the school as a sustainable line of assessment, especially in relation to the compatibility of the operation and action of the group in that direction.

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The research questions and methodology

Having in mind the above, it seems very necessary to investigate the possibility of the 'Groups' to survive in the Greek education system and the impact it may have. To do so, the following questions, must be answered:

1. What is the current progress of the 'Groups', in the school program?
2. What are the learners' perceptions towards it?
3. What challenges arise?

The most appropriate way to answer the questions is the action research. The fact that teachers investigating these questions, teach in the Groups themselves, gives them the opportunity to evaluate the institution and their work.

Analysis of documents and samples of the learners' work, small semi-structured interviews with parents and learners as well as observation are the methods that can be combined to provide the answers and allow conclusions to be drawn (Cohen et al, 2000).

1st research question: "What is the current progress of 'Groups', in the school program?"

While, evaluating the progress and attainment of the program objectives of the group, it is concluded that the original planning of the syllabus was generally followed. There have been delays, as various unforeseen events. Various unexpected meetings teachers were cause to lose some hours of instruction. Moreover, some thematic activities and teaching sessions took more time than originally planned. The teaching plans overall underwent changes large or small scale. Changes are made according to the course of instruction, the growing interest of the students, both within the group and within other subjects-curricular activities. This generally is not contrary to the original design consisted of flexibility in designing and conducting courses. Of course, in the program and there were several visits lectures or speeches by parents or other school partners, any contingencies in the program of their parents or extracurricular always lead to forced differentiation program.

Particularly interesting interest were for children's teachings and discussions were representatives from parents or extracurricular organizations. This applies to sessions carried out by learners in cooperation with parents or members of organizations and local government representatives. Those that were focused on issues such as cleansing water through filtration, photovoltaic energy savings. All sessions were placed in the context of sustainable development and education and were always focused on promoting both knowledge and research skills (Driver et al., 1996; Biltitude & Sardo, 2012).

During the sessions, many different means and tools were used. There was extensive use of the, internet, interactive whiteboard. That happened, in order to show children a rich and diverse audio-visual material for various activities and thematic. Specifically, the interactive whiteboard was used for viewing material and analysis of this material by learners. The

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internet is, generally used as a means of finding information and general pedagogical tools (Wilson & Boldeman, 2012).

The educational activities were arranged, performed or planned to be carried out are also diverse in terms of content or structure. Almost all activities were held during the course. There were activities based on the projection of the material and then analyzed through discussion, representation in painting. There were other things that took place in the form of games. When designing the instruction had the provision for planning both a primary and a backup path instruction, depending on the module, the objectives and the general disposition of the students.

Perhaps the main benefit was the opportunity to shift from the strict and centralized curriculum, which abides the Greek Education System. There were many opportunities to experiment with new, different learning approaches based on the promotion of research skills, creativity and autonomous learning on behalf of the learners.

In short, the main benefits were mostly the flexibility provided for schools, the opportunity for innovative teaching sessions, materials and approaches.

2nd research question: "What are the learners' perceptions towards it?"

As there was extended information addressed to parents for the function and the mission of the 'Groups', in the beginning of the school year. This happened through meetings, which aimed at clear description of the 'Groups' to the parents, so that they can see the benefits for the child to attend a 'Group' and decide, which one of those available would better suit the learners.

However, it was particularly interesting especially in the 'Groups' of Mathematics, Reading and Information and Communication Technologies, that learners in fact had aspired to engage in learning topics that were actually being taught to older learners, such as learners of the early years of the junior high school. Interest in participating in small research projects, was strong but not as strong as the interest to learn "those things that older children learn", as many pupils have frequently stated. This was a vision that was shared by parents in many cases. This case is an example of the contradiction between the expectations and ideas of different education members from a reform (Fullan, 2001).

3rd research question: "What challenges arise?"

So that was clear benefit for the school to include the 'Groups' as part of its educational work, mainly through the provision of flexibility. However, there are several issues that form an impediment in the application of this new institution.

Firstly, the highly centralized and restricting school context does not change. Even though the actual law clarifies that the teacher has the flexibility and autonomy to organize the content of the session and the teaching approach as desired, there are limitations. If a teacher wants to

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organize a visit to a place of particular interest, there are strict time-wasting procedures that have to be done. The same applies to several teaching activities in the classroom, as any materials that are to be used must be thoroughly justified to be risk-less and useful.

Secondly, the lack of a general institution, either in a form or meetings, sites or blogs where teachers can exchange ideas, material, collaborate and communicate does not help educators charged with 'Groups' to perform at best.

Thirdly, being a new institution, there is still lack of understanding on behalf of school administration, in organizing and managing issues, especially when it comes to evaluation and progress supervision. In other words, the head-teacher and consultant must be in continuous contact with the Ministry of Education for further explanations, on what the teachers must submit and to whom.

These challenges justify the findings of Fullan (2001) that for a reform to be effective it should promote or be accompanied by a shift in the wider educational context.

Conclusions

As a conclusion, the 'Groups' are an institution that have stimulated interest in the school. The opportunity they provide for the teacher to design sessions and work, having a level of independence is highly beneficial for the school (Biltitude & Sardo, 2012). This though may collide with the learners' expectations and the wider school culture (Fullan, 2001).

Before making any generalizations, from the above conclusions, it is essential to point out several limitations of the particular study. The sample of the population includes male and female participants from a typical Greek primary school classroom. It was perhaps the most appropriate in consideration of the goals time and place restrictions. However, it is not large enough to make the research findings able to serve as grounds for accurate generalizations or definite future predictions (Cohen et al., 2000).

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PLANNING AND IMPLEMENTING IN-SERVICE ICT-TRAINING TO SUPPORT DEVELOPMENT OF HIGHER EDUCATION TEACHERS' TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE

Jörgen Holmberg, Mats Brenner, Maivor Hallén, University of Gävle, Sweden

Theoretical underpinnings in the planning of the in-service training

The rapid technological development and the growth of online learning, present new challenges for higher education teachers and institutions. New web 2.0 tools create new opportunities for teachers and students to communicate, collaborate and contribute by different modalities. The need for teachers to harness this potential in order to be able to respond to the changing needs and expectations of their students make in-service training of higher education online teachers a priority. What is often overlooked in in-service initiatives however, is that teachers have varying degrees of technological competence and pedagogical competence. They also teach different kinds of content to kinds of students.

This poster presents the implementation and outcomes of two simultaneous in-service training initiatives at the University of Gävle, Sweden. The initiatives were aimed at developing online teachers' ability to successfully integrate ICT in their teaching. When planning this initiative we deliberately wanted to avoid techno centrism and a narrow focus on standards or competencies. Instead we were inspired by Mishra and Koehlers theoretical framework TPACK (Technological Pedagogical Content Knowledge) which recognises that developing the ability to successfully integrate ICT as a tool for learning means understanding the reciprocal relationship between technological knowledge, pedagogical knowledge and content knowledge (Mishra & Koehler, 1986; 1987). Mishra and Koehler has built on Shulman's (1986) pedagogical content knowledge (PCK) to create a conceptual framework that also includes technological knowledge and the ability to successfully integrate this with their pedagogical knowledge and content knowledge. In other words, a teacher that possesses TPACK knows how to successfully integrate ICT in their practice to create an added pedagogical value.

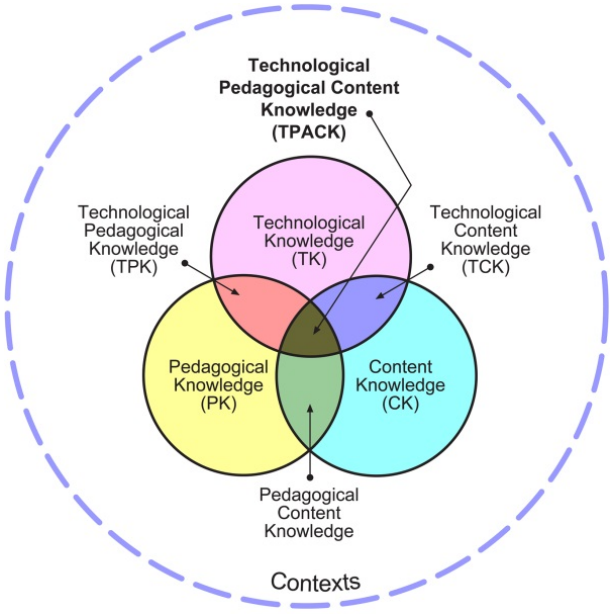

Figure 1. Technological pedagogical content knowledge
(source: http://www.tpack.org)

Accepting this means that any in-service initiative that aims to help teachers develop their technological knowledge must consider, and help teachers' become aware of, how the development of such technological development will both depend on and affect their pedagogical practices and their choice and representations of content. This in turn means that a mere focus on digital tools and technological skills is not a valid approach.

Earlier research stresses the importance for the teaching community to find ways of exchanging experiences of teaching with technology and contribute in building a knowledge base to support teachers when making design decisions (Baran, Correia & Thompson, 2011). There is also research supporting the notion that purposeful use of ICT (i.e. TPACK) cannot be taught as a separate skill but must be actively practiced in an authentic context (Fransson & Holmberg 2012). Hence we decided to offer a demand based in-service training where participation was voluntary and two separate but complementary initiatives were started simultaneously. One initiative focused on identifying individual teachers' perceived need of technological/ICT support and training in the university's Learning Management System (LMS). These needs were then addressed in individual face to face talks and workshops between teachers and ICT-support personnel where the teachers' content knowledge and pedagogical knowledge was also reflected on alongside their technological knowledge.

The other parallel initiative provided online teachers with an opportunity to meet and exchange experiences about pedagogical ICT-use at lunch seminars. Each lunch seminar had a theme and an opening speaker. The themes were suggested by the online teachers themselves and the opening speakers were all employees at the University of Gävle, most often an online teacher who shared his or her experiences of for instance a certain functionality in the LMS when teaching a certain content, or experiences from a certain course where technology was used to achieve certain pedagogical effects

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Context and implementation

The University of Gävle (HiG), Sweden has approximately 14,500 students, more than 50 study programs and about 1 000 courses. Today, HiG is one of Sweden's leading higher education institutions when it comes to distance education. Around 40 % of all students are distance students. Roughly 300 teachers (out of 450) teach online courses. Certain distance education programs and courses have a few meetings on Campus, others are taught exclusively online. Learning Center (LC) is a support and development unit within the library at the University of Gävle. The personnel at LC have extensive ICT skills and many of them also have a teaching background. LC was responsible for the planning, implementation and evaluation of the initiatives described in this poster.

As stated above the first of the two parallel initiatives meant identifying and addressing individual teachers' perceived need of technological/ICT support and training in the university's Learning Management System (LMS) with regard to their individual teaching background and knowledge (content knowledge and pedagogical knowledge) and teaching situation (course to be taught).

The target group was approximately 300 teachers at three different faculties. The time period was 5 months. Every teacher was asked to fill in a self-assessment survey. This survey mainly covered different features and functionalities in the Learning Management System (LMS) and web conference tool used by the university. Based on the needs and wishes expressed by the teachers, personnel from LC with a solid knowledge of the functionality of the LMS and web conference tool scheduled 1-3 individual meetings where every teacher who so wished could perform supervised training and ask questions, test ideas, etc.

The second initiative aimed to provide teachers with an arena to meet and exchange experiences about pedagogical ICT-use. A survey was administered to all teachers at HiG listing a number of suggested themes for a number of upcoming lunch seminars. Teachers were asked to indicate their interest to participate in any of the seminars but also to suggest their own lunch seminar themes. The LC employees who had coordinated initiative one also contacted online teachers they had met to ask about their willingness to act as opening speakers at one of the lunch seminars. Having received feedback on the survey and the individual contacts mentioned a definite list of seminar themes and dates was emailed to every teacher at HiG. To create an additional incentive and to make sure as many people as possible would have the time to participate if they wanted to, we also announced that a light lunch would be provided free of charge to every teacher who signed up to attend the lunch seminars.

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Lessons learned

The TPACK framework proved useful as a conceptual tool for thinking about what successful ICT integration could mean and to help teachers question the common conception that learning technological skills is enough for online teachers.

Overall the combination of the two initiatives was considered successful by participating teachers and organizers. Almost 50 % of the teachers participated in the first initiative (voluntary individual fact to face support primarily in use of LMS and web conference tool). About 17 % of the teachers attended the lunch seminars on at least one occasion. The lunch seminar format was appreciated both because of its relevance to the teachers and because of the format which allowed participation despite the often buy schedules of many teachers.

However, the first focus of the large majority of questions, desired support and lunch seminars concerned technological skills and only a limited number of teachers desired support in designing courses and/or trying new ways of teaching and working with ICT. There was also limited interest in learning about the web 2.0 features of the LMS (e.g. blogs and wikis). This indicates that additional initiatives are needed to further raise the awareness level about what successful ICT integration mean. That it is not only a matter of expanding teachers' technological knowledge but that pedagogical beliefs and practices, as well as choices and representations of content, must be part considered simultaneously.

The chosen method of individual face to face support was much appreciated and considered effective as a means of learning how to successfully integrate ICT. However, as stated above, other findings indicate that this integration would probably have to be further developed in order for teachers' to develop TPACK.

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THE WEB OF LEARNING – A SYSTEMS VIEW

Astrid Høgmo, Studiesenteret.no, Norway

Abstract

Studiesenteret.no is to be called a network of more than 100 Norwegian communities, which cooperate under more than 50 learning centres throughout Norway. Through a "hub" they are connected in an organic learning system. Where recourses (courses) are "transmitted" from universities to local communities. This system is a part of enhancing knowledge as one of the obvious factors in building democracy.

Norway as a nation could proudly present the traditional public system of lifelong learning. With education free of charges from childhood to the highest university degrees. The country also has a history of thinking decentralised in many aspects. The urge to make life possible in rural areas is high. Also in the time of a knowledge society.

The network, also to be called a system, has been facing many challenges and opportunities on the path towards 2013. Where technology, learning and organisational views are rapidly changing. The internet has opened the door for many revolutions. One of them is the revolution in the power of knowledge. Where the ownership of knowledge is loosening up.

In this presentation we will share some of the exiting landscapes to enter in the next few years. Where organic leadership is mixed with our systemic web of learning.

It is of high importance to send many thanks to some of the persons who through their literature (and for some of them discussions) highly affected the way Studiesenteret.no came to be (Sally Helgesen, Michael G. Moore, Paulo Freire, Fritjof Chapra and Göran Lange).

Background

Norway is a small country with 5 million inhabitants. The country has a well-developed university system with high-quality state institutions throughout the country. The current challenge – in our post-industrial times – is that the university system is still designed for "industrial" production. This has a particularly profound effect on the districts – as there is no structure for tertiary education and lifelong learning. Moreover, the entire funding system has been designed for the central institutions.

Per capita, the government is spending "all" of its resources in central areas, whereas investment in the districts is low. The difference in educational level between the towns and rural areas is enormous, and increasing. Some of the differences are a result of the business and social structure in the country. However, this difference will become more problematic in the time ahead, as all rural industries are transformed into knowledge industries. Fishing, aquaculture, oil/gas, power production and agriculture are some examples.

If the focus on knowledge is not raised in the regions, the rural communities will not be able to reverse the negative trends in settlement, industrial and commercial development and appeal. Studiesenteret.no is addressing this challenge. We will help raise the level of competence in the districts. Our municipalities regard this as a strategy for developing attractive, sustainable and robust communities. For Norway as a nation, the aim is to encourage more people to attend tertiary education and together build a broader national knowledge platform.

Establishing a functional system for extensive and continuous university programmes in the districts is demanding, and goes well beyond the technological and educational challenges. First and foremost it is a question of organisational approaches, which in turn define our main focus in the development of the network: the initiatives are directed at communities and individuals who are working to develop their municipality and local communities, or at universities or university colleges which will work to develop regions and individuals – and which have a teaching staff who appreciate such a challenge. It is the combination of these forces that can help everyone in the network to achieve their goals. The network is characterised by an «open source code» mindset. The barriers to educational improvement and development in the districts must be demolished – not erected.

Studiesenteret.no seeks a close and open cooperation with established and state funded institutions – particularly as we believe that our network represents an efficient strategy for reaching central political development goals for all of Norway.

In a modern network – such as Studiesenteret.no – we are also aware of the almost philosophical aspects of developing a modern network society; the idea that we to a greater and greater extent will work in transparent environments, where the physical and virtual will merge. This is about to happen and will take off once the broadband and technological developments have been stepped up a notch. What will happen once the transparent environments are here for real: when, regardless of where you are, you can move – almost naturally – in a sphere where the boundaries between the virtual and the physical have been practically erased? What opportunities will not this generate for the network idea and the idea of new educational methods in new places?

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How to think about systems?

Every society is built on individuals in all ages. Each individual is a resource in the society.

Figure 1.

- How do we prepare surroundings around these important persons that enables them to fulfil their potential and dreams?
- What can we do in order to make societies where the joy of learning is to come true and where democracy grows?
- How can we describe and provide the individuals journey of learning from local life to global opportunities?
- How to describe a journey in a world that changes so rapidly with new possibilities every day?

First of all the ownership of the learning process has to be within the learner. The learner could be an individual or the local community. The learner needs to be aware of why knowledge is needed, for what reason and how to reach it. Each learner has its personal history which makes the need for a personal journey through lifelong learning. Therefore the local processes and choices in facilitating learning are crucial.

Learning centres are one of the local communities' visual tools in preparing for lifelong learning. They connect local people and resources with each other and connect the local society with external resources.

Studiesenteret.no is a system that connects the centres with each other and all the centres with higher educational institutions as well as other resources. We coordinate courses, making a system enabling the institutions to in a smooth way, have lectures and workshops with the students from the entire country synchronous in time.

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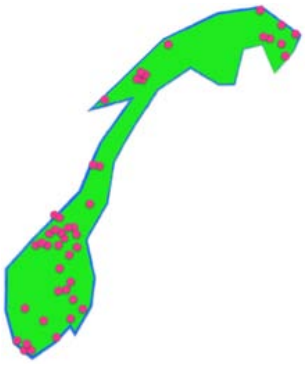

Figure 2.

If we keep on having the learner in the centre, we see how different systems are surrounding the learner and are parts of their process toward a degree or another kind of knowledge. All from local systems, inter-community systems, institutional systems, national systems and now even global systems. For Studiesenteret.no it is of high importance to enable different systems to interact smoothly in order to make the life of learning as joyful as possible. We accept the fact that there are several systems that they change and develop. And Studiesenteret.no is as well a system.

In a world where opportunities develop rapidly, the systems are changing. Sometimes the changes happen faster than we are able to plan. And the interaction between the systems therefore also has developed and transform into new solutions.

Mental maps of structures and the concept of space

Our mental maps about how systems live and how they transform and interact, are crucial factors in being able to plan and work in a knowledge society. We could compare it with the way we think about space in different cultures and disciplines.

The conceptual thought of space in architecture varies between different cultures. In some eastern cultures the room is conceptualised to be organic in the way that you can change it rapidly depending on the needs you have-in time. Even the "walls" aren't statically there. Some walls are to be moved, turned. Some cultures have a more open concept of what a room is. Does this architecture and mindset also affect their way of thinking in a rapidly changing world, where mental maps need to change more rapidly than earlier?

Mental maps of systems could be a tool in how to meet our challenges. If Norway traditionally is having a static perspective into the world of room, space, maps. How does this affect our way of thinking mental maps in these very changing times of history? And if we are talking about mental maps of structures, what happens with **innovation** when we mentally want the maps to be static, the systems to be static, etc.

On one hand we want to and need to make systems. At the same time the systems need to grow and develop organically depending on the surrounding. Several systems functioning

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together in a larger system will therefore have an even larger need to be treated with mental maps where the maps organically change after needs and inputs.

The organic web

If we use the glasses of organically changing mental maps, it is also easier to understand Studiesenteret.no as an organic web of learning.

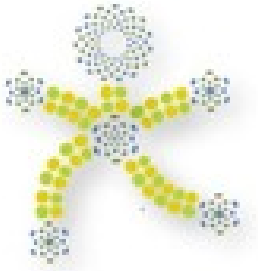

Figure 3.

A web is place where several instances at many levels and with a range of purposes, cooperate in order to fulfil the individuals need for knowledge. A web that is able to rebuild and strengthen in the edges or in the centre if needed. An organic web open for changes, changes which are there of natural reasons and which have to be handled.

Glocal learning opportunities

MOOC is a example of how the "industry" of knowledge is changing. All the suddenly learners all over the world are able to gather knowledge for free, as long as they have a proper internet connection. These new possibilities are encouraging learners to make their own personal strategies, strategies outside of the established university systems. All they might need in the future is an examination.

These possibilities changes the students way of learning. Where they might want to make their own way and study in their own way. How will this affect Norwegian universities, how will it affect the local communities? Will the inhabitants be a force that might change the educational systems more rapidly than we aspect? Will the ownership to the knowledge suddenly turn upside down? Will "the people" take it back? How will initiatives like the once Sugata Mitra are taking, affect new organic webs of learning?

Even with a system like ours, there are huge challenges today in having the established universities to "deliver" courses outside of campus. Although the communities are starving for more education, the state universities choose to work within old and more static frames. The global opportunities like MOOC, might encourage the local forces and individuals to take the challenge in their own hand. The systems might change more organically than we can imagine today. How will this affect the study centres and the local communities way of organizing life long learning facilities.

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A CASE STUDY OF POLES FROM NORTH, SOUTH AND NORTHEAST IN OPEN UNIVERSITY SYSTEM OF BRAZIL: THE NECESSITY OF INNOVATION

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Since June 2011, a study about the Open University System of Brazil (UAB) has been carried out under the leadership of the research group "Teacher training and new information and communication technologies". In the study, 10 % of coordinators of all UAB poles, specifically in the North, Northeast and South region were involved. Main targets:

1. define the professional trajectories of pole coordinators,
2. analyze how the pole coordinators understand the official systems of assessment, and
3. describe the role of these new education territories in public polices of Brazilian teacher training as UAB system.

The period of 2006 to 2010 was the first period of the administration of Executive Office of Distance Education, when 557 poles were already active (in 2012 the total was 618 poles). The regions in focus housed 64 % of poles system assets in 2010, and represented the frequent disparities of UAB system. To extract data we used *interviews*, *crossed visits* (where in *regional pairs have established a simulation of mutual evaluation), and a netnography of the behaviour of these coordinators in the Moodle system (Moodle was used at all procedures of this research).* These two last methods are new and had the purpose to make a kind of participatory research (where the knowledge about UAB poles should be constructed in terms of practices and theories); still, they are experimental methods whose validity we continue studying.

The UAB system was established by decree in 2006, with the objective of articulating the public institutions of Higher Education, state and local delegates, and the federal government. At 2010, 91 Public Institutions of Higher Education worked in 557 poles with 200 thousand students. Establishing advanced integrated units of universities within the country is not a major innovation, but backing these units by the exclusive service of teachers and doing it by articulating disparate forces is a major innovation. So, in this system, innovation is considered a pillar and the poles are the limit of this innovation, because they are new education spaces and need new practices and professionals to make it real.

These poles are places equipped with laboratories, libraries, offices, classrooms and conference rooms which distance learners and students use as a meeting point, configuring a blended learning model. In general, we found that the presence support centres have 10 to 15 courses, offering more continuing training than initial training in cities with 20 to 30 thousand inhabitants, 186 miles far from the state capital. The total numbers of courses offered at the studied poles was 908 and the estimated number of students 25.000.

Among the actors in these centres, the most important is the pole coordinator. He is the professional responsible for academic and administrative management of the pole. According our studies, the pole coordinators are women aged between 31 and 50 years, specialised in some educational issue, who work as Manager at the Local/State Education Department on the last 5 years, and who knew the system of distance education through the UAB. They attributed their nomination to this post as recognition by some project, activity or innovative attitude in the area of school management.

In general, their initial training is varied, but predominantly was in the area of human sciences, with emphasis on pedagogy. Among coordinators from north we have noted a certain political positioning in what is usually called "social movements" and the preservation of the forest. In the south, a certain professionalization of educational management was also detected. More than half of the coordinators occupied the position of Municipal Secretary of Education for more than a mandate. In northeast, great migration transits were detected, consequently, they have more knowledge about other states in their region.

Evaluated by Ministry of Education (MEC) in 2010, 55 to 61 % of UAB poles were classified in an intermediate level of quality. The poles had sufficient infrastructure for undergraduate courses in the area of humanities, but with deficiencies for courses on physics, chemistry and biology. This means that, from the point of view of the infrastructure and institutionalization, the UAB system was still unprepared to respond the main demands for teacher training in Brazil.

For the poles coordinators, the evaluators and the evaluation (the process) prevent the optimization of the system. It is because the behaviour of the evaluators is punitive, their knowledge on the public system of distance education is restricted and their concern with the infrastructure is excessive. For the poles coordinators, the pole cannot be evaluated as a university campus or a great school, because their functioning is totally different. However, they describe this particularity noting that their activities were constituted by the continuing necessity to create innovative procedures to solve problems never met before, even when they were school directors, municipal secretaries of education, political leaders or cultural agents across different states. Among the problems often described articulate the interests of different universities in the same place, and universities and municipalities are the key problems.

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As we can see, the poles of UAB system constitute a broad, complex, but not yet interconnected network. To create discursive bridges between distinct points of view to understand UAB system constitute a huge challenge now. Promoting, by network, an intersection between the poles, universities and federal government could optimize and make a more sustainable public policy.

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PROMOTING THE USE OF SOCIAL MEDIA IN FINNISH GENERAL EDUCATION

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Introduction

The use of educational technology is becoming more and more a part of everyday pedagogy in Finnish schools. New teaching methods are developed in response to the challenges of society and new learning cultures. Problem-solving, cooperation, and interaction skills are a key part of future working life skills. One way to promote a learner's ability to face future challenges is to draw attention to a culture that consciously supports collaborative and social actions. Hence we need to pay attention to collaborative teaching and learning methods in schools to support and promote the new skills.

The rapidly increasing everyday use of social media has drawn attention to the potential of social media in educational use. Continuously improving and expanding accessibility, ease of use, functionality and flexibility have made social media increasingly attractive in place of, or in addition to, traditional educational tools (Boulos, Maramba & Wheeler, 2006). Social media has many characteristics that can be beneficial to a new collaborative and social culture, practices and methods in schools, teaching and learning (Armstrong & Franklin, 2008).

The national social media coordination project for Finnish general education has gathered several projects and experiments from different schools at different levels. Many of them are giving small signals of change in pedagogy and the whole learning culture in Finnish schools. Schools are experimenting new and even quite unorthodox ways to adapt social media in teaching and learning. Teachers have also started to adapt social media and personal learning networks as a tool for their personal professional development. In this presentation we will discuss the use of social media and address some emerging issues and experimentations by pioneers in different schools.

The National Social Media Coordination Project

Social Media in Finnish General Education is a coordination project funded by the Finnish National Board of Education (FNBE). It was initiated in 2010 and, currently, it coordinates 20 FNBE-funded development projects related to the educational use of social media in pre-school, primary education and secondary education. The general objective of the coordination

project is to support the development projects in their operations and to establish and strengthen the use of social media in education. The coordination project looks for similarities between the development projects and helps the projects to network with each other as well as with other relevant actors in the field.

The coordination project, together with the development projects, aims at:

1. gathering, processing and distributing best practices and experiences in the field and especially from the development projects funded by FNBE,
2. guiding and supporting development projects working on the educational use of social media by sharing pedagogical and administrative practices,
3. reporting and producing support materials,
4. arranging training and seminars, and
5. carrying out research on the use of social media in education.

The project is undertaken since social media and different kinds of virtual environment have become a natural part of the everyday environment for many people, and therefore it would be artificial and old-fashioned to ignore them at school, in teaching and learning. The desired impact of the project is more efficient and more appropriate wide-spread use of social media for educational purposes.

Issues Raised in the Development Projects

There are several issues addressed by the development projects, which relate to promoting, implementing and supporting educational use of social media. These issues extend from creating a new school culture, planning and governing curriculum work, and managing ICT facilities to the actual pedagogical use of social media in learning and teaching by learners and teachers. The issues and experimentations concern, for example,

- leadership, curricula and community construction,
- learning and teaching environments,
- learning and teaching methods,
- support for learning and teaching, and
- active cross-boundary participation.

The gathering, processing and distributing of the best practices and experiences surfacing in the development projects is currently under way. In the presentation, we intend to discuss the issues and experimentations in more detail and give some cues to adopting social media in schools.

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CVE – CORPORATE VOLUNTEERING FOR EDUCATION

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Introduction

Constant growth and development on the work market derives in the need of having better equipped and qualified staff. The speed of the technical innovation and the changes it triggers decreases the time dedicated to apparentship and induction. Employers raise selection standards and thus education itself should identify means and ways through which learners can increase their employability changes.

Corporate volunteering is one of the alternatives education has to better link and update to the requirements of the work market. Although corporate volunteering presents a really viable solution to liaise employers and education it has not been valorised to its full potential. Teachers and trainers play a most important role in bringing the two parts together.

The content and quality of teaching impact upon the students' performance after graduation and must be thus be kept under constant monitoring. Moreover, teacher training programmes need to be developed in direct connection to latest technological updates and innovations. The importance of this has been underlined by the European Commission in the common Framework for teacher competences and qualifications. However, collaboration with employers as a potential training source is still to be developed and supported.

CVE project addresses this need of aligning education to the requirements of the work market by training teachers and school representatives to analyse, plan and implement corporate volunteering projects which impact on student intake and performance.

Project team and project objectives

CVE has brought together specialists in education from seven countries:

1. Krakowskie Centrum Zarzadzania i Administracji Sp. z o.o. – Poland
2. Fundatia EuroEd – Romania
3. Cesie – Italy
4. Inovafor – Portugal
5. Fundar – Spain
6. Metgem – Turkey
7. African and Caribbean Diversity – UK

The objectives of the project are:

- To analyse implementation of corporate volunteering activities at national level in the partner countries
- To develop an international analysis document
- To collect and select examples of best practices from the field of corporate volunteering
- To develop training materials and organise training for teachers and school staff
- To support and enhance the collaboration between schools and business through corporate volunteering activities.

Through the analysis implemented at national level CVE project team has highlighted the following:

- There is the need of awareness and understanding of the concept of corporate volunteering both for school and business representatives
- Volunteering activities between schools and business are mainly focused on charity and donations
- The potential of corporate volunteering in education needs to be illustrated through case-studies
- Formal education systems are yet to be adapted to embed collaboration with businesses that would trigger student higher performance and study relevance

As a result of these findings the project team has developed a research approach and case studies have been collected within all partnership countries. Research has shown that from the total of over 50 case studies less than half could be categorised as corporate volunteering activities. Although money donations and technical equipment did support education processes, authentic corporate volunteering activities would have had a far greater impact on the educational offer and students' intake.

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To address this CVE team presently works on developing a training programme for teachers and other school staff to initiate them in planning and implementing corporate volunteering activities in collaboration with local businesses.

The training programme is developed in a blended manner using online support in order to increase access to materials and to encourage international collaboration and sharing. During the training participants will be initiated in:

- Preparing an institutional analysis for their own school
- Identifying potential business collaborators at local level to commonly develop corporate volunteering activities
- Developing an implementation plan for corporate volunteering activities that would increase the educational performance of students

At this stage the CVE team has finalised the CVE handbook which is part of the Trainers' Guide. The material is available in several languages, online, on the project website at http://www.cve-project.eu.

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THE CENTER OF JOB KNOWLEDGE RESEARCH

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Background

In the HRM domain the role of (job specific) knowledge is increasingly being recognized especially in the field of personnel selection. Most personnel psychologists nowadays seem to agree, that empirically at least, general mental ability (GMA or intelligence) is the single best predictor of job performance, regardless of job type (Salgado, Anderson, Moscoso, Bertua, de Fruyt & Rolland, 2003). That is, of all predictors of job performance available today, general mental ability appears to correlate most strongly with job performance. Strangely, however, we know very little about why GMA is related to job performance, although leading authors in this field consistently claim that people who score higher on general mental ability acquire more job knowledge more quickly and are therefore able to demonstrate superior job performance (Schmidt & Hunter, 2000). Job knowledge therewith appears to be a more proximal predictor of job performance than GMA. Job knowledge is not only predicated in intelligence, as education obviously also contributes to its development both directly, and by moderating the effect that GMA has on job knowledge (no matter how smart one is; if one has not received training in a particular job role one is unlikely to excel in it). Despite the high (meta-analytic) predictive validity of job knowledge, strangely it continues to receive scant research attention with only 2 % of publications in the personnel selection field focussing on it, as opposed to other (relatively more straightforward) selection methods such as intelligence tests, assessment centres, and employment interviews (Cucina, Gast & Su, 2012).

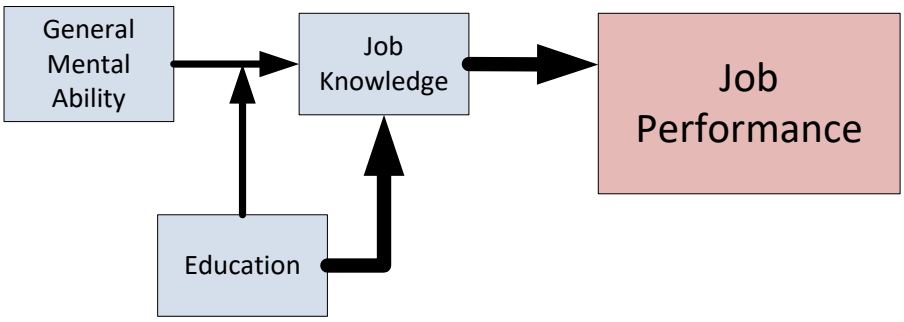

Figure 1. Job Knowledge as a mediator

To date, little effort has been made in promoting of the abovementioned idea. The OntoHR project – Ontology Based Competency Matching between the VET and the Workplace – (http://www.ontohr.eu) was one of the first attempts to exploit and apply the concept for job knowledge ontology based selection and training for real jobs in the ICT VET sector. The novelty of OntoHR is that for students, who do not meet the selection criteria that apply to a particular position, we provide customized pedagogical content so that he or she can master the required knowledge and competencies efficiently. Once the merits of using this approach to match IT students to jobs have been further substantiated, the generalization of this methodology to other VET domains can be greatly facilitated by the dissemination of the deliverables of this project. This idea has been extended by the Med-Assess – Adaptive Medical Profession Assessor – project (http://www.med-assess.eu). In Med-Assess the application domain of these adaptive labour market driven assessments have been enlarged to the medical sector, more precisely to neuroscience nurses. In this context our adaptive assessment and training solution will assist medical organisations to test newly recruited nurses, to monitor knowledge, abilities and skills of current employees, provide personalised training on the basis of these assessments and track expertise across the organisation. Figure 2 shows the cycle of the Med-Assess evaluation.

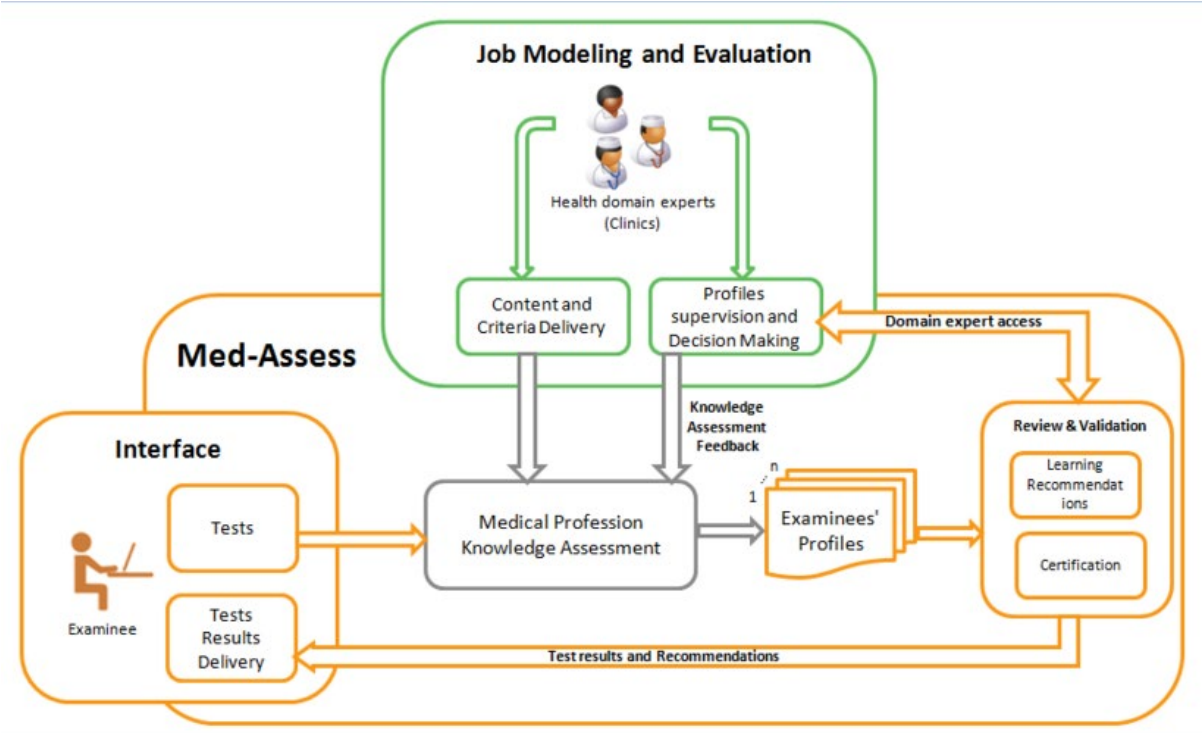

Figure 2. Med-Assess evaluation (Mol, Kismihók, Ansari & Dornhöfer, 2013)

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Objectives

Filling this increasingly conspicuous research gap may in due time put an end to the arduous process of first testing students to allow them to successfully exit Education, only to test them again upon organizational entry. Indeed in the future, we foresee that this technology might further facilitate the blurring of education to workplace boundaries by allowing the adequate and accurate measurement of time to proficiency in a particular occupation, while at the same time continuing the delivery of training content that is tailored to the needs of the individual student.

Therefore we want to foster research on Job Knowledge, which is one of the main facilitators of citizens' transitions between education and labour market but also between jobs within the labour market. How shall Educational institutions handle and process the data, coming from a system like OntoHR? What are the best ways to provide comprehensive feedback towards Educational institutions? How should particular education centred competence matching systems be set up to enable the comparison of labour market input competences with educational sector output competences? With OntoHR the work has been started on developing a matching interface, which matches job-role and vocational education competences on a keyword basis, but there should be more in-depth investigation and analysis on this issue. We continue our effort to put Job Knowledge related practice and research into a wider context, on the basis of OntoHR, Med-Assess, and through an institutionalized research centre that is named the Center of Job Knowledge Research (CJKR). Our mission is to advance the application of specifically defined job knowledge in the areas of selection, recruitment, and lifelong learning, by modelling job knowledge and using it to construct jobs, predict job performance, and plan individually tailored interventions.

Our efforts will be utilised in the industrial, governmental and educational sectors. From an industry perspective the Center of Job Knowledge Research is suitable for delivering adaptive, personalised education and training. Tools, like OntoHR or Med-Assess, are also capable to be deployed as a complex selection and recruitment platform that is responsible for personalized corporate training based on the applicant/employee assessment profile. This function is beneficial for organisations with knowledge intensive jobs in which the employee fluctuation is high. CJKR might also be interesting for intermediary organisations – such as headhunting organisations or student counselling – between education and work.

In the governmental sector both Education and labour market monitoring institutions can use this approach to monitor current trends and match them with current output of educational institutions. This may help to ameliorate structural unemployment, employee re-distribution or re-skilling according to industry demands. It is also beneficial if the government wants to check graduates and match them according to their performance to particular occupations in the industry. This would support the career start of recent students while at the same time lowering the chances of post-graduation unemployment.

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The most important asset of the Center of Job Knowledge Research is an interactive stakeholder community, which is an on-line forum for researchers, educational and industry organisations to discuss relevant problems, issues in connection to the aforementioned transitions and articulate concrete research problems that could be matched with the interests of researchers working in this field. This community will be extended with relevant EU projects, engaged in this problem. One important factor of OntoHR's success was that these efforts were attempting to connect three different disciplines, (HRM, eLearning and Knowledge Management).Educational experts, HRM practitioners, academics, educators, instructional designers, content developers, system developers, programmers, ontology engineers were all working together to accomplish a shared goal. This portfolio of different skills and knowledge added immense value to the success of OntoHR and it would be undesirable if this community cannot continue to cooperate.

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TOWARDS E-LEARNING REQUIREMENTS IN VET

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Summary

The article describes the development of the tool for self-evaluation of VET institutions for e-learning, based on the developed model of e-VET readiness. The model was based on innovation aspects of e-learning (EC, 2008), using requirements in pedagogy, technology and organization as a basis for self-evaluation. It was further modified to meet the requirements for cooperation of VET schools and training organization with the field of work, stakeholders and local partners. The tool and the model were developed during e-VET Ready project that responded to the lack of sustainable and systematic approach to planning and managing e-learning in VET. Self-evaluation tool, designed and created through the project, can enhance school awareness of the need for a systematic approach towards implementation of e-learning in VET schools and is easily adaptable to different VET areas, countries and contexts. The tool can be used as a first step that will allow for analysis of specific needs and prerequisites for e-learning integration into the VET school curricula in the following areas:

1. Organization and management;
2. Teaching and Learning;
3. Technology integration;
4. Cooperation and employability.

Introduction

The goal of the Europe 2020 Strategy is to turn Europe into a smart, sustainable and inclusive economy, among other actions, by developing VET systems that will be able to support it. As professions are increasingly technology-dependent and use of ICT is a need across different VET sectors, there is a need to introduce changes to VET school practice [1] in order to build systems that are more attractive, relevant, career-oriented, innovative and flexible.

In this context, e-learning is seen as a tool and a method for supporting several issues: a platform for lifelong learning, support for collaboration between VET schools and industry, and preparation of students for technology-dependent and digitalized work environments through development of student and teacher key competences (i.e. digital competences,

entrepreneurship, social and civic competences and learning-to-learn), as well as specific vocational skills [4].

E-learning can enhance access to training and qualification for both regular and lifelong learners while encouraging flexible training arrangements as a strategic objective [1]. The advantages of e-learning in VET-related context are numerous: re-training of the experienced employees, remote access to labs and virtual environments, increase opportunities of networking among schools and employers, enhanced digital and social competences among the learners, sharing VET-specific educational resources, to name a few.

Ready for e-learning

Implementation of e-learning is a change [2] that can be introduced through various national initiatives, with formal support, recommendations, legal regulations harmonized with European VET initiatives. However, the implementation itself depends on a specific context of each school and specific conditions in which teachers and students work, learn and collaborate with local communities. It was the aim of e-VET Ready project to investigate this bottom up context and to discuss possible initiatives towards sustainable implementation of e-learning in the vocational schools and training institutions.

e-VET Ready is a partnership project of six European institutions contributing to the enhancement of vocational education and training by e-learning in VET schools and organizations. The overall objective of the partnership is to increase capacity for e-learning in VET schools and partnering institutions and to raise awareness of the need for a systematic and sustainable approach to planning and implementing e-learning in VET schools. These objectives address the demand for VET to adapt to the fast changes in vocations and industry by using e-learning as a support for faster development and update of curricula, continuous education and training of VET teachers, as well as for enhanced cooperation with the employers and other strategic partners.

As vocational education is diverse on the EU level, the partnership aimed at bringing together various stakeholders to share experience and different perspectives to VET systems, as well as to learn from each other about the specific national and school requirements for e-learning. The partnership therefore comprises of the research network, universities, VET institutes and VET schools to represent diversity of context. Its aim was to develop and test evaluation tool for VET institutions to facilitate their self-evaluation towards readiness to implement and develop e-learning.

Context and definition of e-VET Ready model

The baseline for the self-evaluation questionnaire was the model developed in CARNet E-learning Academy, based on "The use of ICT to support innovation and lifelong learning for all" [3].

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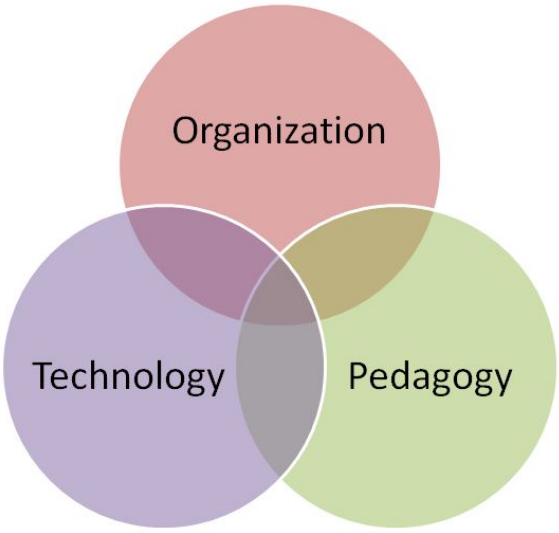

Figure 1. Pedagogical, organizational and technological innovations. Source: CARNet E-learning Academy, based on innovative aspects of e-learning in "The use of ICT to support innovation and lifelong learning for all"

The e-learning triad consists of organization, technology and pedagogy, pointing out that strong innovation in organizational and pedagogical areas are the key drivers for using full potential of the technological infrastructure (Figure 1). This model was modified to fit better into the context of VET sector:

- pedagogy was expanded into teaching and learning so as to be applied to concrete activities of teaching and learning in schools, leaving out theoretical principles of pedagogy variously approached to in different countries;
- cooperation category was added as essential for a contemporary institution to connect vocational schools with labour market more closely and also to extend the scope to the external partners and stakeholders (other schools, employers, local government and community and European project partners).

All 4 categories run through the filter of VET, thus focusing e-readiness on any specific aspects of VET in organization, technology, teaching and learning, and finally, cooperation.

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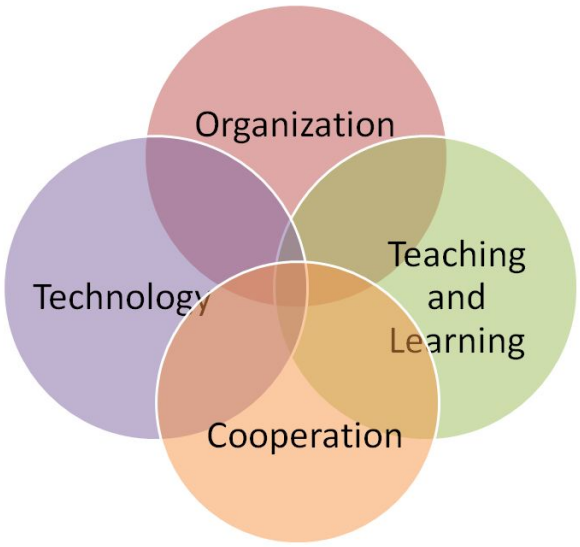

Figure 2. Four categories of e-VET readiness. Source: "e-VET Ready project", http://www.evet-ready.eu

Organizational, pedagogical and technological aspects of e-learning implementation at the school level are characteristic for all educational institutions, and include strategic planning of e-learning, discussing technology as integral part of teaching and learning, and seeing technology infrastructure as a foundation that requires upgrade or even superstructure of pedagogy and user requirements [2].

However, to reach the goals of European and national VET strategies, VET organizations take special care of cooperation with different partners to produce not only professional future employees or entrepreneurs competitive on the labour market, but also lifelong learners able to adapt to fast changes in the highly technologized professions [5]. Enabling access to infrastructure and digital learning materials requires demanding investments that are not within reach for every school. Sharing resources within school networks, local community and with companies can level the infrastructural obstacles, regardless of time, place and specific school resources. Shared resources can be in the form of digital learning materials, online tools, student and teacher placements, joint curriculum development, supporting cooperation of schools, teacher and students with employers and interested communities (government, regional, non-governmental, parents). Having this in mind, the cooperation was identified as the next key moment of e-learning for VET development, and a valuable moment to investigate further. Organizations that investigate all potentials given by technology to meet the aforementioned targets we have called e-VET ready organizations.

To clarify further, the organizations that are e-VET ready are not only those already e-mature, but those who are willing to change and discuss what are the institutional requirements for e-learning in the four categories of e-VET readiness (Figure 2).Implementation of e-learning requires systematic approach on organizational level and it involves planning and managing resources and projects in school environment, instructional design, integration of technology in school administration and cooperation of schools with outside partners. The hypothesis is, if a vocational school (or organization) is ready for implementing e-learning on

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organizational, technological, teaching and learning and cooperation level, the school/organization can be assessed as ready for e-learning in vocational sector, or e-VET ready. e-VET readiness is therefore a framework of e-learning principles involving and considering VET organizations, especially vocational schools, and is defined as the readiness in four categories identified as crucial for systematic and sustainable implementation of e-learning in VET, defined for each school/organization as follows:

- **Organization**: school/organization is e-VET ready in terms of organization when it plans strategically the allocation of resources needed to support the e-learning development, including time, human resources and finances.
- **Teaching and learning**: school/organization is e-VET ready in terms of teaching and learning when it uses e-learning to reach the learning objectives defined in the curriculum, especially for the vocational subjects, in order to educate competent vocational experts competitive on the labour market.
- **Technology**: school/organization is e-VET ready in terms of technology when it ensures comfortable use of technology for all parties involved and brings technology from the workplace into classroom and vice versa.
- **Cooperation**: school/organization is e-VET ready in terms of cooperation when it provides ICT tools to all the partners and stakeholders so they can work together to define and reach common goals (learning goals, learning situations in the classroom or in the workplace) to prepare students for the labour market.

e-VET ready tool and the self-evaluation methodology

Personnel of the VET schools is involved in the analysis of their own needs and in the planning of e-learning on the organizational level in their own contexts through self-evaluation of e-learning readiness. For this purpose, a tool for self-evaluation of e-learning in VET called 'e-VET ready tool' is designed and developed. It enables VET schools (management and staff) to discuss the specific e-learning needs and requirements of VET schools and to take into account different aspects of e-learning implementation on the pedagogical, technological, organizational and cooperation levels. It is design to trigger discussion within the school in order to get the broad picture of the current developments and is used for surveying perception of vocational schools of their readiness for e-learning. The aim of the tool is to enable self-evaluation of schools readiness for e-learning in the 4 categories described above. The tool consists of online survey, additional materials with e-VET readiness definition and best-case scenarios.

It is performed in a controlled online environment preceded with an introductory description and followed by the discussion. The tool enables the collective reflection on the practice in using e-learning for modernizing VET. It is recommended that the survey is taken in the team of school staff. [6]

The tool was developed using participative approach in a group work, using world cafe, open space, circle practice and other participative methods through which all partners were able to

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express the needs of their own institutions and countries VET systems. This was of a particular attention as the categories, definitions of e-VET readiness and the questions in the self-evaluation tool were adapted to meet the specifics of VET in Slovenia, Belgium, Lithuania, Poland and Croatia, as the piloting countries in the project.

The tool serves all school staff (teachers, headmasters, deputies and expert staff) to become aware of e-learning benefits and prerequisites for systematic approach in introducing and implementing e-learning with the goal to advance the quality of organization they are responsible for. It helps them to perceive the e-learning implementation holistically and in a strategic context. Furthermore, it enables to make informed strategic decisions about the role of technology and e-learning to potential collaboration partnerships and networks with industry and other schools, investments and financial matters, training needs and other planning and management issues in their area of responsibility. Teachers can expand their knowledge related to use of e-learning in their subject, with their pupils, reflecting on why using technology and with what goals, specifically in the area covering instruction and pedagogy design.

The self-evaluation can help VET institutions to set up a platform for preparation of future projects. The important part of VET development is collaboration. By analyzing their needs and determining their strategic objectives in e-learning implementation, schools will be able to approach different stakeholders and propose collaborative projects on issues relevant to their analysis and context. We expect that the tool will be useful for preparation and motivating teachers to initiate or join in collaborative projects with other schools, including in eTwinning projects, sharing resources and knowledge they identified through their analysis.

Preliminary e-learning requirements in VET

Based on the preliminary findings from piloting e-VET Ready tool using small sample of 20 schools from five countries, the following requirements were identified in the four categories of e-VET readiness:

E-learning requirements in VET in terms of teaching and learning

- E-learning is used to reach the learning objectives defined in the curriculum, especially for the vocational subjects, in order to educate competent vocational experts competitive on the labour market.
- Digitally competent teachers and learners, and lifelong learners improve their competences continuously. Both are able to use, re-use, develop and create e-content as well as evaluate digital materials for reaching individual learning goals and developing key and professional competences.
- E-learning is thought of as integral part of the teaching and learning process. The institution encourages interaction among teachers and learners using e-learning and social media to enhance learning activities. Teachers understand the added value of

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technology for various assessment methods, including diagnostic, summative and formative assessment.

- Social media is used to receive and provide feedback for the learners, especially in formative assessment e.g. e-portfolio-based assessment, learning diaries etc.
- Individual path and pace of all the learners is supported and catered to their special needs and requirements (e.g. learners with disabilities, talented and gifted learners, students travelling or temporarily out of system). Learners are included in finding innovative ways of using technology to enhance the achievement of the learning objectives, to support the methodology, to enhance the coaching and assessment and to generate collaborative and social learning.

E-learning requirements in VET in terms of technology

- Internet connection, equipment, software and technical support for all parties involved is ensured by the school (whether in school, at home or anywhere else where applicable)
- Teachers, students and visitors have free Internet access in the school. For learning/teaching purposes students and teachers can use computers provided by the school/organisation. Teachers can enhance their teaching with classrooms equipment as well as adequate electronic equipment for vocational subjects provided by the school/organisation. Professional VET software is up-to-date. Up-to-date software does not have to be the latest version, but the one that allows for acquiring of skills adequate for labour market.
- As new technologies are widely used by teachers and students, the personal data of students and teachers is protected on school level. Adequate legal regulations are implemented in the school and data are secured accordingly.
- Teachers are supported in using ICT for teaching and learning on several levels. During planning and developing of online courses teachers consult their ideas and technology-related problems with technical staff. Teachers have the opportunity to use digital materials available in the online repository in which other teachers publish their own work. Since the teachers can use multimedia tools while they develop their digital learning content, the materials are interactive and support online activities. Teachers are also supported during facilitation of online courses. The teachers harmonise the activities and the technology they use with the facilitation and assessment of online students.
- At the same time students in an e-VET ready school/organization can ask for help while using technology for learning purposes.

E-learning requirements in VET in terms of organization

- Strategy for the integration of e-learning is in place on a school level, supported by policies about the use of ICT (Internet access, software, equipment, security and intellectual property rights) and a development plan. A good development plan includes procurement of digital devices, equipment and specialised software. In addition to that, it is vital that the plan includes raising the awareness of teachers and

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teacher training for the use of ICT in instruction, both in terms of technical skills as well as didactical skills. Ideally, the implementation of the plan should include not only the training of the teachers, but also their involvement in proposing the necessary equipment and software.

- In order to achieve these benchmarks, the resources for e-learning are allocated in terms of time, staff and budget.
- In order to assure good quality e-learning, time and opportunity for evaluation and revision of e-learning practices should be ensured.

E-learning requirements in VET in terms of cooperation

- ICT tools are provided to all the partners and stakeholders in order for them to work together to define and reach the common goals to prepare the students for the labour market. The school has important stakeholders and partners, e.g. students, teachers, parents, partner schools, local community, companies and employers, local/regional/ national agencies and chambers, networks or associations who can contribute to the quality of learning, and the ICT is used to reach that goal.
- Variety of ICT communication tools for cooperating with partners and stakeholders are used, such as using online fora to share experiences with school partners, initiate cooperation via e-mail or through social networks, ask for advice or help via skype or other videoconferencing tools or share your documents online while already working on a joint project.
- The common goals are defined with school partners and stakeholders and they may include defining learning goals for each student with a mentor in the workplace, or translate learning situations within an e-learning platform from the classroom to the workplace and vice versa.
- The school/organization is using partner/stakeholder knowledge, experience and resources to improve school teaching practice, to design and develop digital educational resources. Additionally, ICT can help school run practical projects lead by students, find the right placement or internship for the students in companies, and assess the development of student competences while on internship by using an e-portfolio.

Disclaimer

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WWW.KUNNSKAPSBASERTPRAKSIS.NO – ONLINE RESOURCE FOR HEALTH CARE PROFESSIONALS WORKING EVIDENCE-BASED

Kamilla Hedvig H. Myklebust, Katrine Aasekjær, Grete Oline Hole, Centre for Evidence-Based Practice, Bergen University College, Lillebeth Larun, Norwegian Knowledge Centre for the Health Services, Norway

Aim

The aim of this poster is to describe an online learning resource in Evidence-Based Practice (EBP), which is freely available for Norwegian health care professionals, teachers in health disciplines and their students. It is developed to be used within different pedagogical models and frameworks.

Background

Evidence-Based Practice

EBP is given high priority within health service area internationally as well as in Norway, where health care professionals are required to work evidence-based (The Norwegian Directorate of Health 2005). EBP requires that decisions about health care are based on the best available, current, valid and relevant evidence. These decisions should be made by those receiving care, informed by the tacit and explicit knowledge of those providing care, within the context of available resources (Dawes et al., 2005). The goal of EBP is to provide the best possible care for the patient through combining research-based knowledge, experience-based knowledge and the user's knowledge and participation as demonstrated in Figure 1.

Figure 1. Model for evidence-based practice (Nortvedt et al., 2007)

EBP follow six steps:

1. reflect over your work,
2. form a clinical question,
3. search for the best evidence,
4. critically appraise the evidence,
5. apply the evidence and finally,
6. evaluate the use of the evidence (Figure 2).

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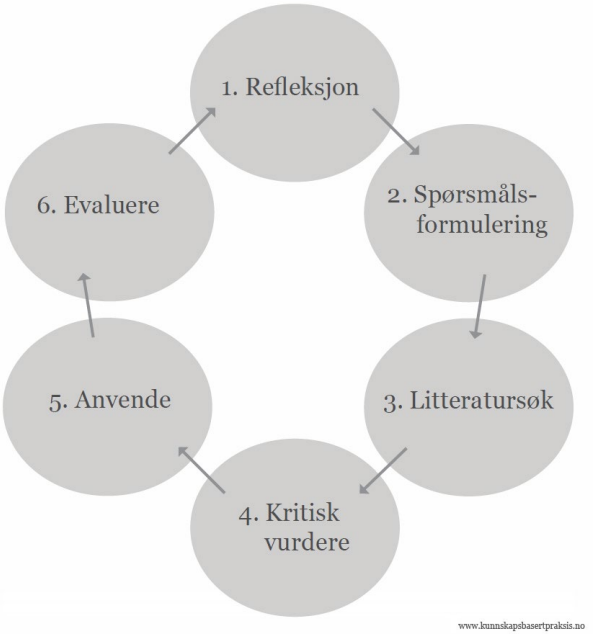

Figure 2. Steps of evidence-based practice
(source: http://www.kunnskapsbasertpraksis.no, Trinnene, (2012), under a Creative Commons Attribution, NonCommercial, NoDerivations licence: http://creativecommons.org/licenses/by-nc-nd/3.0/)

Underlying pedagogical philosophy

Teaching EBP have from the start built upon what is known about adult learning (Knowles, 1980; Bryan et al., 2008), workplace learning (Mumford & Roodhouse, 2010; Eraut, 2007), as well as constructivist learning theory (Jonassen, 1999). Emphasis is put upon making the learning as relevant as possible for the participants. Their previous experience is taken into account and the task they work with should reflect their own practice. Focus is upon tasks relevant for their daily work, so the learners can use the new knowledge immediately. According to the constructivist principles; individuals learn through interaction with their environment. The problem drives the learning and the teacher serves as a facilitator, guiding the learners as they struggle to use the received information in their problem solving (Collins, Brown & Newman, 1989).

The learning resource

With the requirement for all healthcare workers to work evidence-based, education in how to find relevant research, and critically appraise evidence from research is necessary. To acknowledge this Bergen University College (BUC) and The Norwegian Knowledge Centre for the Health Services (NOKC) developed an online resource to give health care workers and others an online overview of the principles of evidence-based practice. The resource site has been available since fall 2008 at http://www.kunnskapsbasertpraksis.no (protected by a Creative Commons CC BY-NC-ND 3.0 license).

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The online learning resource was created using existing knowledge from teaching experience in evidence-based medicine (EBM) around pedagogical templates (Jara & Mohamad, 2007). The site is based upon the first edition of the workbook "Å arbeide og undervise kunnskapsbasert", ('To work and teach evidence-based') published by the Norwegian Nurse Association (Nortvedt et al., 2007). The site is structured around the six steps of evidence-based practice (Figure 2). Each step is presented with a brief introduction and complemented by a screen lecture explaining key elements of this particular step.

The site also contains a complimentary literature list and downloadable models and tables used in evidence-based practice. Originally the site contained learning objectives, assignments and a quiz for each section. The assignments where based upon the pedagogical model with tasks designed to enable the reader to use their new skills in their own work. This part of the website is now under reconstruction.

Intended use

The learning resource is intended to work as a stand-alone resource for health care professionals, teachers and students who want to learn more about EBP, and as elements of a blended or online course in EBP. By constructing the resource in different modules, teachers can use parts of or all of the material in their own teaching. The learning resource is intended to support lifelong learning (LLL).

Jara and Mohamad identified different templates for integrating technology in courses, ranging from only online administrative support to complete online discussion based learning (Jara & Mohamad, 2007). Their model was used as a framework when planning the course; as seen in this modified version of their templates (Figure 3). The online resource can be used both as a source of mixed mode/blended learning as well as elements in an online course.

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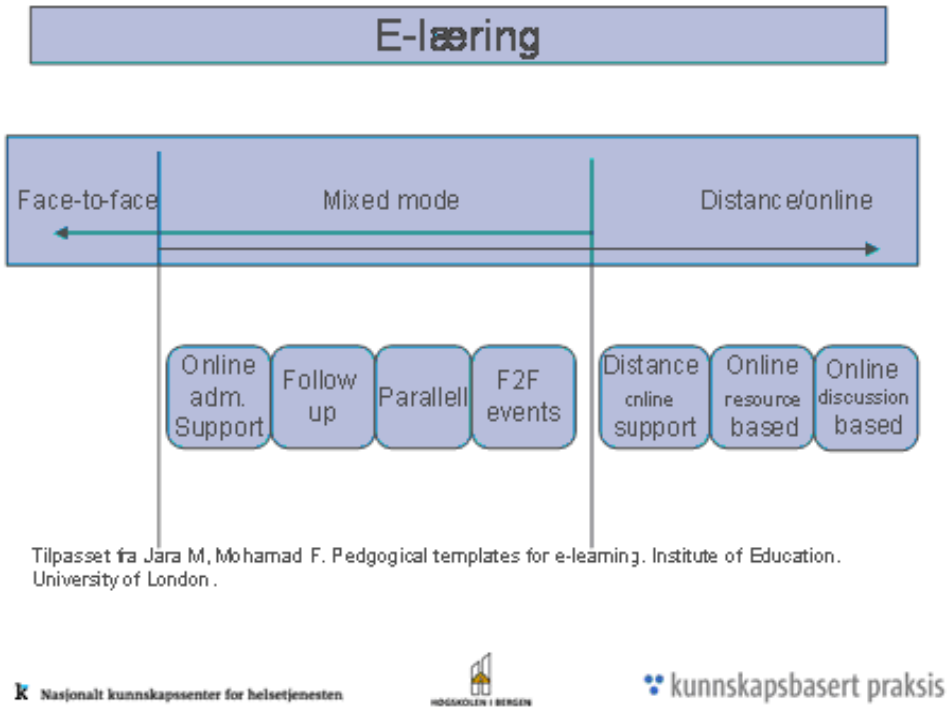

Figure 3. Modified pedagogical templates used in development of the course

Examples of use

As a learning resource at Haukeland University Hospital

BUC has a close collaboration with the Children's Clinic (BKB) at Haukeland University Hospital. A 6 ECTS course; "EBP for clinical instructors" developed at BUC, was carried through in close cooperation with the head of the wards at BKB. This course was integrated in the "Module-based Clinical Competence-development" programme established at Haukeland University Hospital. Kunnskapsbasertpraksis.no was used as the main learning resource for this course.

As support for a Master's degree and a 15 ECTS postgraduate education in EBP

The Centre for Evidence-Based Practice at BUC uses the site as a learning resource both in their master's degree and in a postgraduate education in EBP. Other institutes at BUC present the site to their students and encourage them to use it both in their studies and as a resource in their clinical work.

The postgraduate educations overall aim is to present a basic knowledge of EBP and give the participants the skills of the six steps of EBP. It is organized over one semester, with three study weeks where the students meet for lectures and workshops. The main learning process for the participants takes place in between the study weeks. The students are encouraged to use the site in close relation to their own clinical work.

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Audience overview

The overall use of the site increases when the post-graduate program is held (Figure 4). It is possible that the increase in visits is due to more than the post-graduate program, but it is probable that the arrangement of the course is at least part of the reason.

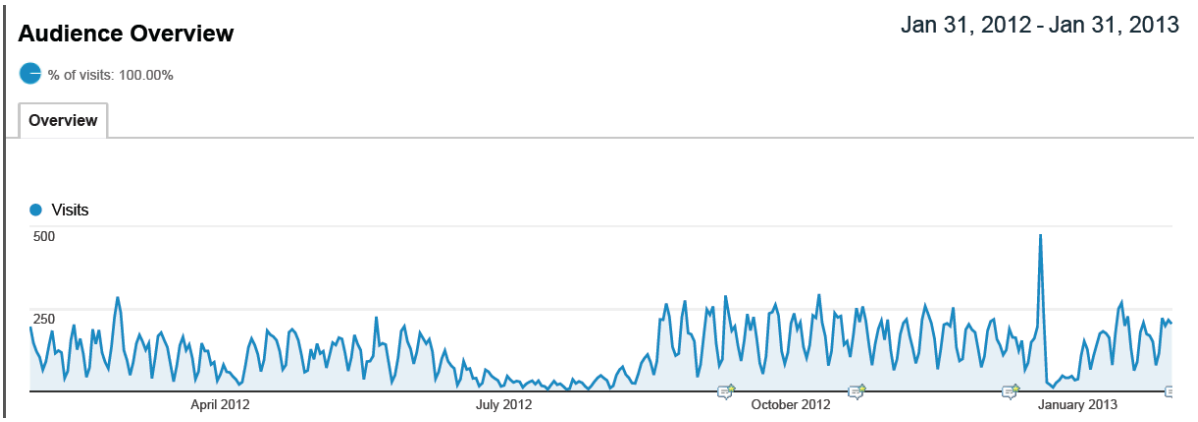

Figure 4. Audience Overview of Visits from 31st of January 2012 to 31st of January 2013. The post graduation program was held from September 2012 to the end of January 2013. The module weeks and final exam are marked.

Development of the website

The site is under continuous development. A master's degree evaluating the user experience and usability for the site, were completed in spring 2012. This qualitative descriptive study revealed that the users found the online course easy to use and fairly useful, but that they considered it too overwhelming as an introduction to EBP. The nature of the online course was also questioned and the participants in the study would rather describe it as an online resource or information site (Stabell, 2012). Based on this study and general user feedback, a number of changes have been made to the site. The learning objects, assignments and quiz have been removed from the site in order to refine it as an online resource rather than a course. The course elements will be used in the development of a shorter, more specialized introduction course in EBP.

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THE BOLOGNA PROCESS AND STUDENT MOBILITY – FIRST RESULTS OF THE SAGE PROJECT

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The SAGE Project

Student Advancement of Graduates Employability (SAGE) is a pan-European project aimed at increasing the knowledge of the effects of European higher education reforms implementation on the graduates' employability. SAGE also aims at enhancing the capacity of student representatives to take part in influencing and building policies designed to improve the rate of graduates' employability at European, national and local level. Research on educational policies and trainings for students and stakeholders are conducted during the three year project phase (10/2011 – 3/2014). Student representatives will be empowered to take a more active part in higher education and in national policy decisions regarding educational concerns. The project is coordinated by the European Student Union and partners are five national student unions from all over Europe and the Innovation in Learning Institute of the University of Erlangen-Nuremberg.

One research aim in this project is the review of educational policies like the Bologna Process and the analysis of this process from the perspective of European students and student unions, who are the direct beneficiaries of this process and who can evaluate ongoing problems and improvements at first hand. The 'Bologna with Student Eyes 2012' report also compares the improvement since the last 'Bologna with Student Eyes' report in 2009 (ESU, 2009). In this paper one topic of the report 'Bologna with Student Eyes 2012' (2012) will be evaluated, namely the improvements of student mobility as they are perceived by European students during the last three years.

Theoretical background of the Bologna Process and progress in student mobility

The Bologna Process, which started in 1998, has three main targets: the facilitation of mobility, facilitation of international competitiveness and cooperation and facilitation of employability by creating a comparable degree system (European Commission, 2010). By creating an international concept for student courses, work load and curricula, exchange between European countries should be simplified to give students better opportunities to study and work abroad in other European countries.

For the topic of mobility, this means that mobility in Europe should be promoted for students, teachers, researchers, and administrative staff to benefit from the richness of European Higher Education Area including democratic values, diversity of cultures and languages (Papatsiba, 2006). Furthermore, it is hoped that higher mobility also increases university quality because universities all over Europe have to compete with each other (Mechtenberg, 2007). In the EU Communiqué of 2009 it is stated that in 2020 at least 20 % of all students should spend a period abroad for example with the ERASMUS program. These are promising plans, but in reality mobility during their study is not reachable for many students. According to Vossensteyn et al. (2008), ERASMUS students tend to come from higher socioeconomic groups and for many students from lower socioeconomic groups grants and loans are not sufficient to study abroad. In the ESN report (Alfranseder, Fellinger & Taivere, 2011) 80 % of students spending a period abroad answered that their grant covered less than 60 % of their living costs. Nearly all students need additional loans or money from jobs or help from relatives. Also other obstacles exist when students want to study abroad. Other problems are language barriers, administrative problems, unbalanced mobility (some countries are more attractive for students than others), higher fees for non-EU students, and lack of information (ESU 2009).

Not much research has been done so far about the changes on these topics since the last years of the Bologna Process. The aim of the 'Bologna with Student Eyes 2012' (2012) survey is to measure the progress and changes that were achieved since the last 'Bologna with Student Eyes' report in 2009. Concerning mobility, the main research questions were about incoming and outgoing mobility in all European countries, the obstacles of mobility and the progress to overcome these obstacles in the last years. Main results are described in this paper.

Methods and Measures

Participants

National student unions from all over Europe were asked to fill in a questionnaire on views and perceptions of the progress of the Bologna Process. In total 45 student unions from 37 countries received the questionnaire. 38 unions from 35 countries filled in the questionnaire in the required time period (six weeks in the end of 2011). This is a compliance rate of 84.4 %. Questionnaires were mainly filled in by the responsible persons of student unions who had a lot of knowledge about the topic. In some cases the questionnaire was filled in by a team of student union members.

Measures

Participants received a 75 page long questionnaire about all relevant topics of the Bologna Process. The questionnaire consisted of 214 open and multiple choice questions about 17 different subtopics. Every subtopic was introduced to the participants with a short definition of the aspect to assure that everybody had the same definition in mind when rating the subtopic. Examples for subtopics are: the Qualification Framework, Life Long Learning, cycles

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and ECTS, Social inclusion, Recognition of diplomas etc., financing of higher education and of course mobility, to get a comprehensive insight into the higher education system of all European countries. The mobility subtopic, where this paper focuses on, consisted of 26 questions about internationalisation and mobility in each country. National student unions answered questions about incoming mobility to their country like treatment of non-EU students in their country, e.g. regarding student fees and facilities and internationalisation strategies, about outgoing mobility like access to programs and language courses and obstacles to mobility for incoming and outgoing students. Examples for obstacles were administrational barriers, limited access to loans and grants, problems with recognition of credits, limited information, and language problems.

Procedure

Before the questionnaire was distributed to all student unions, five national student unions from all over Europe participated in a pre-test to test if the questionnaire was comprehensive and understandable. After some improvements, all 45 student unions received the word document questionnaire via email and had the opportunity to answer all questions during the following six weeks. After filling in the document, unions sent it back via email. Content analysis was used to analyse the data.

Results

The largest obstacle to student mobility seems to be financing, 22 of the student unions see this as a main problem. Recognition of study results is seen by 10 unions as a big problem, followed by lack of information and guidance and other supportive measures which universities in all countries should provide more. 9 of the unions see these points as important obstacles to mobility. The lack of flexibility for staying abroad e.g. in the student's curriculum is seen as a big problem by 7 countries. However, also personal reasons of the students, like the lack of motivation or attachment to family, work or home country, is seen as an obstacle by 7 unions. Only 5 countries say that language barriers are a big obstacle for student mobility. Obstacles are also displayed in Figure 1.

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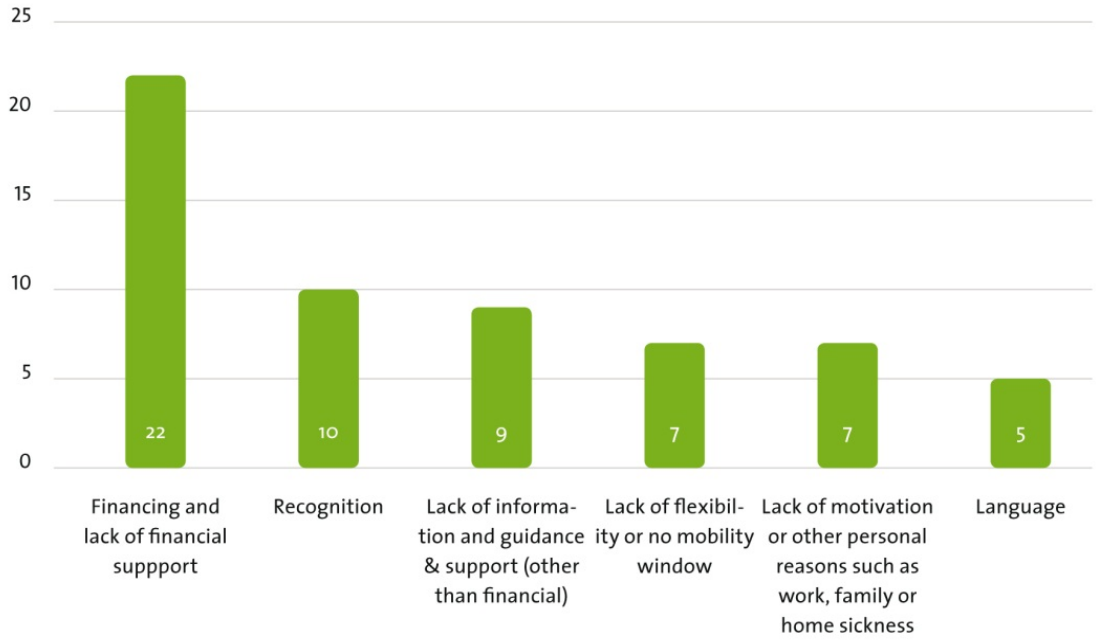

Figure 7. Biggest obstacles for student mobility identified by student unions (*N* = 37)

These numbers show that many obstacles for students still exist. When comparing the data with the data of the last report, some progress on some topics is visible, but also some negative trends seem to exist. Big progress has been made in many countries on the topic of administrative support and availability of information about studying abroad. Little progress is perceived on the availability of language courses before and after the departure, on the equal distribution of mobility to different groups like disabled students and on recognition by the home institutions of credits gained during studying abroad. Even a negative trend is visible on bureaucratic obstacles to mobility.

On the most important obstacle, the financing of studying abroad, progress trends differ between countries. In some countries a positive progress is visible whereas in other countries a negative trend can be measured. It is still the case that in most European countries the ERASMUS grants are not sufficient to cover living costs. Furthermore, respondents were asked if their students are able to pay their living expenses with their grant or loan or if they need more support e.g. from jobs or parental support. Answers are shown in figure 2. Only outgoing students from Luxemburg seem not to have problems with this issue. All other unions reported that few, some or many students have problems to pay their expenses when studying abroad. Unions were also asked about the perceived progress on this point since 2009. For 12 unions no progress is visible, for 11 unions little progress has been made, and for unions from Azerbaijan and Belgium the level of grants and loans has improved a lot. Italy indicated that the level of grants and loans decreased. Compared to the results of 2009 some progress occurred but the level seems to have stagnated and loans and grants are still not sufficient in many countries.

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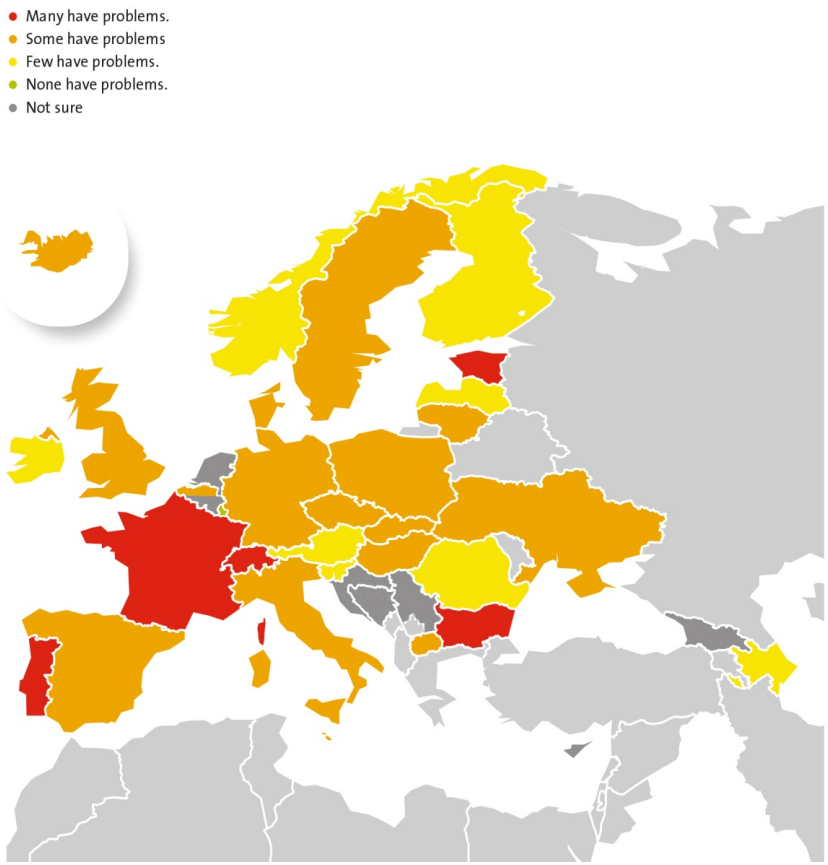

Figure 2. County ratings if their students have problems meeting their study and living expenses from their grant or loan when spending a period abroad ($N = 37$)

Aside of the insufficient level of grants and loans a big concern is the portability of these grants and loans. Only in five countries no problems concerning portability of loans and grants exist, but in all other countries some problems are likely to occur and in two countries (Romania and Lithuania) portability of loans and grants are not possible at all. In general portability of loans is better than the portability of grants. However, replacing grants with loans is not an option as this will increase inequality gap in mobility and make mobility less attractive to students who fear that they are not able to pay back their loans later.

Discussion

It seems that some progress on removing obstacles of mobility is made but that this progress lost speed since the last measurement in 2009 (ESU, 2009). Most progress has been made in removing administrative barriers and small progress is monitored on language course offers, distribution of equal chances between different student groups like disabled students to study abroad and the recognition of study credits. But bureaucratic obstacles even seem to increase for students who want to study in a foreign country. The biggest obstacles are still financing constraints. Many countries report problems regarding the portability of loans and grants and nearly all countries report difficulties about insufficient levels of grants and loans. This might also be a reason for unbalanced mobility flows between countries. Students from some countries simply seem to lack the possibility of spending time abroad due to financing

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constraints and therefore only a few students from high socioeconomic levels have the opportunity of studying abroad. If in 2020 in all European countries 20 % of all students should spend a period abroad (Communiqué, 2009); more progress especially on financial support needs to be done in many European countries, e.g. loans and grants need to be fully portable and ERASMUS grants need to be raised to meet living coasts for different European countries. Institutions and national governments need to commit to fulfilling the policy lines of the Bologna framework by undermining these existing obstacles with more reliable data.

However, as this study only relies on a quite small sample of student union representatives, more data is needed to get a reliable picture of the situation for all students from different European countries. Therefore, bigger data collections from students are needed and data must be assessed more systematically and on a regular basis.

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ANALYSIS OF TEACHING-LEARNING POTENTIAL OF THE BME ALFA E-LEARNING SURFACE

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History of the BME Alfa

The development of information and communication technology (ICT) and e-learning forms is defined both by ubiquitous computing and the technical-social attributes of virtual learning space. This space can be characterized as organic learning environment, while its educational theory is based on e-learning. It gives multiple opportunities to exploit the dimensions of time and space, providing both asynchronous and synchronous learning forms (Benedek, 2008).

In 2012 BME Faculty of Natural Sciences the teachers working at Institutes of Mathematics and Physics created the BME Alfa online practice surface. This initiative was intended to help the students prepare for entry tests required to be taken by some departments. Only after they have passed, the tests the students would be able to enrol to desired majors. The online practice surface can be found at: http://alpfa.bme.hu.

The authors focus on this new learning aid, especially on new possibilities, tasks and innovation it represents. Interest is taken both in students learning affinities and attitudes.

After necessary preliminary conciliations, it was made possible for the authors to take part in the project of creating the BME Alfa online practice surface. The previous title of the project was "Mathematics and Physics for High School Students", while the URL was: http://tinker.eik.bme.hu/moodle/. Soon we started the procedure of manually uploading the test questions into an online data bank.

The creation of records

During 2012 summer and autumn we uploaded 355 test questions into the Physics database. All together there are 1082 test questions available in printed form. This means that one third of the projected task has already been completed.

The question recording was a manual process, but we are working on an automated mode as well. We received the test questions via e-mail in scanned form. The images were clear, so we were able to apply optical character recognition (OCR). The process was successful and digital questions records were created.

After this we had to proofread the test questions. In the field of Physics it is extremely important not to make any errors in the texts or equations. The inaccurate characters for example were replaced by word processor's automated process of change. After the corrections had been accepted, we started uploading the records.

Our IT staff developed a program which made it possible to upload all the records into the Moodle based BME Alfa page. Most of the questions were multiple choice types. At the admin page there were several fields for question and answer input, so we had to assign the correct answer for each question. Also an option was added to skip any question. The general rule was that the correct answer was worth a point. When a wrong answer was given, half a point was subtracted, while skipping a question left the result unchanged (Csákány et al., 2012).

Another type of questions uploaded to the Moodle system was based on calculus. In this case the process, as it turned out, was much more complicated, so for now on the record of these questions was put on hold. This type differs from the multiple choice in several aspects. In the text there are interactive variables, so each student would get a personalized data set. These variables are generated by the system according to the parameters given. This is a really useful function, because every time the test is taken, the student would basically have to use the same formula. This helps to learn how practical mathematical and physical knowledge should be used (Horváth Cz., 2010; Vágvölgyi, 2012).

These test questions built the foundation of BME Alfa mathematics and physics database. Several courses at the Faculty were linked to the database. The parameters given by the teachers established the right ratio of question as they were systematized into categories according to their topics. These questions built the ground of mock exams, which could be taken by students at their convenience and discretion.

Student supervision

The first trial run of the system was unsuccessful as the server couldn't handle the load. In spite of the initial failure, the BME Alfa online practice surface is progression towards its goal. The senior high school students will soon able to practice for their entry exams in fields of mathematics and physics.

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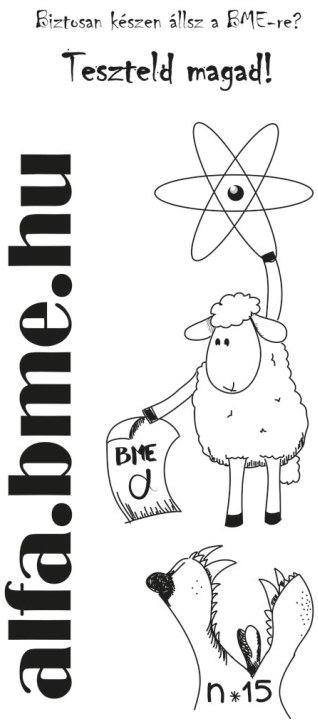

Figure 1. The advertisement of BME Alfa (source: Szabó, 2012)

The work required real cooperation. Every topic had an appointed lead whose task was to report on the progress during the regular meetings.

Figure 2. BME Alfa home page

Moodle – The engine and structure of the page

The e-learning environment was provided by the Moodle, which is actually abbreviation for Modular Object-Oriented Dynamic Learning Environment. This environment provides several opportunities for interaction. The main advantage of Moodle is that the 3 key factors involved in the learning process: the student, the teacher and the curriculum can meet independently of time and space. Moodle provides an environment where the interactive

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functions of learning can be exploited. Students can read textbooks; download additional articles, and interesting material. Using forums or chat they can easily communicate with fellow students or with their teachers. They can ask questions, consult or solve tasks in a workgroup. The Moodle environment provides a glossary of definitions, and a wiki function, a system similar to Wikipedia, where students can generate content. And finally, exams can be performed by taking online tests.

Within the BME Alfa two courses are available for public. These are the mathematics and physics practice surface. It is required to register in order to reach them. It is possible to expand the system and add further courses, for example competitions, academic courses and examinations. The courses are divided into topic related curriculum, mock questions and forums. It is possible to take both courses the same time as the system supports multi tab browsing (Molnár, 2011).

Topics

Mathematics

- Algebra
- Trigonometry
- Geometry
- Functions
- Equations, word problems

Physics

- Mechanics
- Thermodynamics
- Electricity
- Optics
- Modern Physics, Gravitation

Survey on BME Alfa efficiency and future perspectives

In September 2012 a student paper was written on the topic of new e-learning environments and their efficiency. The work was aided and supervised by the teachers working at Department of Technical education.

In order to write the paper, it was required to examine the system extensively. It was done both from the perspectives of developers and administrators. The later was possible due to the statistics, the visitors and download logs. The most important perspective was the user's point of view. We tested the usability, the ergonomics, and the functions, searching for advantages and errors the same time.

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The survey on efficiency and future perspectives of BME Alfa was conducted with the use of Google Forms. The link of the survey was sent to those who had applied for admission to BME, and registered on the interactive page.

Figure 3. The sheets of the survey

From 300 surveyed users, 30 replied due to the short deadline, so we had to work with this amount of data.

The questionnaire

In the questionnaire respondents were asked to mark their previous knowledge, type of education, interests in fields of mathematics and physics. As the BME provides tuition free preparation courses for the ones who apply for admission, we were interested in if they took part in any of them and what was their opinion about their effectiveness. The following questions examined the results of their first test, namely the placement exam in mathematics and physics.

We were also interested in the usability of the page. The respondents were first asked to tell their opinion about the framework, and then the two different practicing surfaces.

We also surveyed the time spent on the pages, furthermore, the date of registration and last use were also important information. Finally the efficiency was surveyed according to the user satisfaction rate.

When asking about the two practice surfaces, we enquired about the prerequisite knowledge, how much it took to prepare, how difficult the test questions were, were they sufficient, how much time was spent during preparations, and whether the uploaded theoretical summaries were helpful.

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Summary and evaluation

After the results had been processed, they were presented as diagrams with simple statistical methods. The analysis showed that there is a significant teaching-learning potential hidden in the BME Alfa system. It helped us see what strategic ways of development the system should take. There is a linear relationship between the time spent on the page and the test results, and there was no significant difference in aspects of gender. The participants of the survey lacked the test answers and sometimes found the level of difficulty too easy

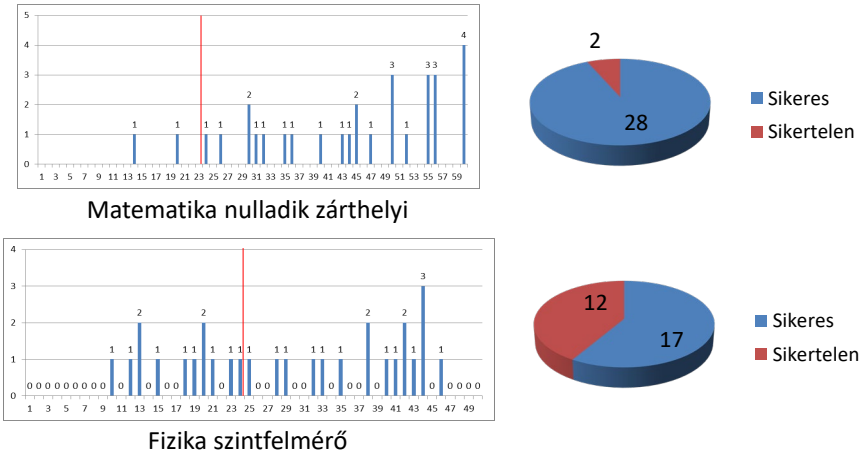

Figure 4. Results of preliminary tests

The survey results confirmed that there was a visible progress thanks to the use of practice surface. The biggest potential of the system stands in successful preparation for entry level tests. It can also prevent delays and postponements, both characteristics of higher education. We can state that it is justifiable to continue observing the efficiency of the system in the long run.

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CHALLENGES OF OPEN EDUCATIONAL RESOURCES (OER) REUSE IN THE BRAZILIAN HIGHER EDUCATION CONTEXT: WHAT AUTHORS THINK?

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Introduction

The definition of OER (2002) is been spread among Higher Education Institutions (HEI) worldwide. One of the most important collections of OER in Brazil is the TECA repository. It is mainly composed of printed educational materials developed to assist undergraduate courses in public institutions in the modality of distance learning. Those contents are produced by professors from public higher education institutions from the state of Rio de Janeiro and it became available and free. The increase and customization of producing of relevant contents can be facilitated by the possibility of authors to reuse an existing content to create a new one. This research investigated what authors from the portal TECA think about the remix of their contents. Starting from interviews conducted with six professors of HE in public institutions in the state of Rio de Janeiro we identified the main factors of stimulation and restriction of those professors regarding reuse.

Institutional context

In 1999 the six public universities in the state of Rio de Janeiro, Universidade Federal Fluminense (UFF), Universidade do Estado do Rio de Janeiro (UERJ), Universidade Estadual do Norte Fluminense (UENF), Universidade Federal do Rio de Janeiro (UFRJ), Universidade Federal Rural do Rio de Janeiro (UFRRJ) and Universidade Federal do Estado do Rio de Janeiro (UNIRIO) gathered in a consortium funded by the Government and created the Centre for Distance Higher Education of the State of Rio de Janeiro (CEDERJ). Initially it was focused to offer undergraduate courses for teachers of primary and secondary school.

Within three years, CEDERJ proved to be a success among students and in 2002 the Government of Rio de Janeiro created the Science Centre Foundation and Distance Higher Education for the State of Rio de Janeiro (CECIERJ Foundation), in order to extend free higher and quality education within the state.

The undergraduate courses are offered every six months and the admission process is carried out by CEDERJ with selection tests developed by the partner universities. Teachers of CEDERJ come from those public institutions and are the authors of the educational materials that are offered and distributed to the students. This content is sent to CEDERJ, whose professionals develop the instructional design of each lesson prepared by the teacher before making them available to students and printed in PDF format. The production of those materials is paid by CEDERJ and the CC license given by the authors is the no attribution (Mariano et al., 2012).

Understanding the importance of sharing its educational contents, CEDERJ created in 2010 the OER repository TECA. The collection consists of educational materials produced by CEDERJ and partner universities, but documents are also accepted from others who are interested in publishing their work in this kind of environment. In 2012 the Consortium achieved the number of over 26,000 students enrolled in ten undergraduate programs.

Open Educational Resources

In 2002, UNESCO defined the term Open Educational Resources (OER) as having open access to all educational material, with a diverse community of users that allows the access without commercial purposes. (UNESCO 2012) This material can be used and reused for teaching, learning, and research.

OER can be considered as courses and curricula, teaching modules, student handbooks, books, research articles, videos, podcasts, assessment tools, interactive materials, databases, software, applications, and any other educational material designed for the use of teaching and learning.

This paper shows the first results of this working in progress that aims to identify and discuss what authors of printed educational materials for distance learning at CEDERJ think of the reuse of their contents.

Methods

The methodology used is the case study approach (Eisenhardt, 1989; Eisenhardt & Graebner, 2007), focusing on authors of printed educational materials for undergraduate courses available in the TECA repository. The interviewers showed in Table 1 have produced at least 3 OER contents and have also academic recognition in their field.

The selection of the interviewees was carried out by their academic recognition and relevant experience in producing educational materials. The methodology applied is particularly helpful in investigating types of research questions that start with “why” or “how”, which focus on current phenomena involving real world problems (Yin, 2005, p.19), such as the research question in this study. In a case study approach, cases should be contextualized by specific and well-delimited characteristics (Stake, 1995). We examined what authors of

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contents for distance education courses think of the reuse in the context of their produced materials.

We focused on creating narrative interviews (Auerbach & Silverstein, 2003) by designing semi-structured interviews. These interviews include essential questions under study, while offering flexibility to pursue additional questions that may emerge during the interview (Trivinos, 1987). The goal of these semi-structure interviews was to understand the interviewee's perspective by raising questions based on interviewees' answers, as a means to generate more in-depth insights (Patton, 2002).

The interviews were conducted and recorded in November/December 2012 and January 2013 with the interviewee's permission. Our semi-structure interviews were designed to contain some questions and a conversation to help interviewees feel comfortable while keeping a specific focus (Merriam, 1998; 2002). The interviews were conducted in the native's language (Portuguese) of the interviewees and lasted from 20 minutes to 1 hour 30 minutes.

Table 1: Interviews

Author profile	**Content production (quantity, field)**
Female, associate professor at UFRJ, Ph.D. In Political Science in 2001, 5 books published, 18 academic papers	3, Sociology
Male, associate professor at UNIRIO, Ph.D. In Social History in 2003, 5 books published, 15 academic papers	3, Sociology
Female, associate professor, UFF, Ph.D. and M.Sc. in Computers and Systems Engineering (1992, 1997), 2 books, 8 academic papers	4, Entrepreneurship
Male, Emeritus professor, UFF, Ph.D., MSc. in Mathematics, 9 academic papers, 6 books and books organization, a member of the Brazilian Academy of Sciences, Commander's award in the National Order of Scientific Merit by the Ministry of Science and Technology	3, Pure Math
Male, professor at UFF, Ph.D. and M.Sc. in Mathematics, 3 academic papers, 12 books and books organization	4, Cryptography
Male, associate professor, UFF, Ph.D. in Mathematics	3, Geometry

The authors' point of view

The preliminary results show that the authors support the dissemination of their contents as open educational resource (OER). They have been paid for those productions and agreed with non-commercial use and no attribution license. The contents are available in the OER repository TECA and allow authors to reach a greater number of readers and optimize the government investment in the production of the contents. The visibility provided by the repositories, such as TECA, is highly valued by all respondents. However their major concern is that the ideas and visions presented in their contents could be somehow twisted when adapted by others, this fear was especially among authors from the social science field. They also fear about the quality of the reused material, that it would loose the previous quality.

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Therefore the authors from social science and entrepreneurship are against the reuse of contents. The reuse was not a big concern among the authors of math materials; however for them the remix would have to go through its original author for validation.

This research suggests the need of a deep study about the resistance of the authors in the reuse of their educational contents. These elements would help policy makers from the universities to think about new models that would allow the reuse, respecting the limitation of authors that produce high-quality contents.

Discussion

The offer of free and open content in the TECA repository was a step forward by HEIs in Rio de Janeiro in the way of OER practices. This initiative created a new model of producing open content in which the authors are paid by the contents and agree to give them a license for use (no-attribution licence). As a result of this initiative a great number of high quality content became available for Portuguese speaking students.

However, the HEIs that takes part of CEDERJ need to make a new move toward OER and build ways and new models to reuse educational contents in order to produce new materials that could be adapted into new contexts. This step would allow the production of new contents in tune with the characteristics and reality of the different regions in Brazil. This is also especially important when taking into consideration the heterogeneity of the courses, approaches and curricula of the HEIs in the country.

A policy for reuse must include a broader discussion about the content's authorship. The research showed that authors are apprehensive about reuse because they could not recognize themselves as the original author of a remix content. Therefore, it is necessary to discuss how to ensure quality of remixed contents. We have to answer questions like this: How to build a system of content quality assurance in a country like Brazil? The relationship between individual freedom (and the ego of authors), authorship respect and efficient use of the public resources must be part of this discussion.

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iREAD VERSUS PAPER READ: THEIR IMPLICATIONS IN THE CLASSROOM

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Abstract

In past decades, people acquired and started the skill of reading using very initial and premature aids such as papyrus, stones, rubber or animal skin that would help them read their texts and achieve their goals. To date, with the advent of technology appliances and electronic media like computers, laptops, iPods, iPads, PDA, iPhones and so many other smart devices, reading behaviour has been enormously and increasingly affected in this digital age. Today, young learners the, "digital natives," live in an information-saturated environment and in a situation where they are placed and exposed to two different forms of reading: onscreen and classical reading. This research paper reports on a comparative empirical study between ireading or digital reading and classical paper-based reading and their implications in the classroom at Sultan Qaboos University. This research paper aims at identifying the differences that EFL students experience in reading behaviour when they do screen reading and paper reading. Another objective is to find out what system (modern or classical) students find more effective, user-friendly, authentic and more motivating in enhancing and developing their reading skill in an EFL context. Reflection diaries followed by qualitative semi-structured interviews were utilized as research instruments to collect data from potential participants. Participants of this study were English Language Specialist students doing their English courses at the Language Centre (LC) and a sample of Sciences Programme students doing their EAP (English for Academic Purposes) at the LC. It is hoped that findings of this study l help suggest better library services for students and library users, in terms of researching and reading. More importantly, the results should aid course designers and teaching material writers to choose, design, and consider the ongoing development as regards technology. Also significant, findings of the current study have offered recommendations to develop strategies to assist students with reading electronic texts and teach them the specific skills needed.

Introduction

Research on reading is not a new concept. There is a huge body of literature on studying reading as a skill. Reading dated back nearly two centuries where people read for different purposes. It started with men reading holy books and prayers and developed to women and children reading different stories and books (Bleeker, 2010).In contrast, modern and digital reading is still a newly established concept (Walsh et al., 2007).

Classical Reading

According to Bleeker (2010) by classical reading we mean any form of traditional reading done on paper in using a medium of a book, a story, a novel, a newspaper or a magazine and an encyclopaedia. It is normally done for different purposes: biological, historical, psychological, physical and educational.

Digital Reading

Ree (2008) defines electronic reading as any digitized version of print, electronic document formats such as PDF, and e-books or e-journals designed to be read on line or through specific hardware interfaces. It can also include: items like images, graphics, hypertext, navigational buttons and other reading tools such as dictionaries (p.1).

In this ongoing technological revolution, our students, across the spectrum, need to be able to read and write more proficiently in academic genres just as they need to understand and view their participation online a bit more critically (Wilber, 2010, p.10).

We all talk about the fact today that kids today do not read or write. They are too busy in a world full of technological distracters. Yet again we should not forget the fact that these new technology tools allow students to read and write.

> *"[W]e know that they spend a lot of time online and that being online involves reading and writing. We can build a bridge between the literate lives of our students outside of school and the literacies we want to teach them in our classrooms by capitalizing on their expertise, interest and engagement with new technologies." (Wilber, 2010, p.13)*

And some new technologies lend themselves well to teaching reading and writing in the literacy classrooms (ibid, p.11).Using mobile phone in learning different aspects of the language including: writing, reading or grammar is one example of this as stated by (Al Amri, 2011)

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Theories of Traditional Reading

Theories of traditional reading and modern reading were reviewed. Further, the researcher went through a perusal of literature and examined current and recent studies done on paper and electronic reading.

These theories are discussed by Pardede (2013) as follows:

1. **Traditional bottom-up view**: It focused on the printed form of a text. It claimed that learning was based upon "habit formation, brought about by the repeated association of a stimulus with a response" (Omaggio, 1993, cited in Pardede, 2013, p.2).
2. **Cognitive or top-down processing** (Schema Theory): It emphasized the role of background knowledge besides what appeared on the printed text. It explained the previous background knowledge and information that the reader would have when reading a text.
3. **Metacognitive view**: This theory based its principles on the control and the strategies and techniques that the reader can apply to comprehend a text. It stresses the involvement of the reader's thinking about what he is doing during reading process.

Theories of Modern Reading

After having discussed theories of traditional paper reading, theories of modern reading are going to be discussed now.

1. **Maryanne Wolf**
   Wolf asserted that modern readers go through the risk of under developing their brain capacity, when having access to online information. She also fears that children may become sheer "decoders of information", fooled into believing that infinite access to information is equivalent to true knowledge and that they accept facts and data unthinkingly (Bleeker, 2010).
2. **Alain Giffard**
   Giffard remarked that the browsing behaviour done by the reader on the Internet is a good illustration of the indefinite nature of modern reading. He believes that browsing creates "zapping" behaviour, meaning jumping from one page to another. This leaves the reader with a double responsibility of deciding on what to read and what to discard (Bleeker, 2010).According to Giffard, the digital reader is left with "a functional and cognitive task and an intellectual responsibility" which makes him both an author and an editor (ibid, p.14).
   Giffard also stressed the important role of bookmarking or tagging that the readers apply both in traditional or classic reading as well as modern reading. He also stresses the crucial role of memory when reading. These activities can function as mnemonic techniques practised by the reader in both digital and traditional setting (ibid).
   Another significant conclusion that Giffard came up with is that digital reading has a considerable limitation as a practice and that technology is imperfect because it has

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many imperfections .Hence, it is humanity, readers, responsibility to come up with a solution to these glitches, by applying skills, methods and strategies to cover up for these deficiencies (ibid,p.15).

3. **Anne Mangen**
   She brought up the concept of immersion in reading and emphasized the role played by our bodies in the process of reading, particularly the use of our hands and fingers in "immersive fiction reading". She also distinguished between two types of immersion: the one experienced with a book called "phenomenological immersion", while the one experienced or practised on the screen is called "technological immersion" (Bleeker, 2010, p.16).
   Mangen distinguished three types of human-technology relations: embodiment, hermeneutic and alterity relationships. An example of an embodiment relation is the book as a transparent medium. On the other hand, technology serves as a mediator between the outer world and the reader is represented in the hermeneutic relation. In alterity relationship, however, the user is consciously aware that his interaction with the medium-computer is positively desired (ibid, p.17).
   She concluded that alterity relation triumphs over embodiment and hermeneutic relationships. To put it differently, the text will remain digital and the distance between the two ends, the reader and the screen, is always remote (ibid, p.17).
4. **Terje Hillesund**
   Hillesund differentiated several forms of reading, counting on the objective of the reader and on the reading material. He emphasises two different types of reading: continuous and discontinuous. Continuous reading is defined as a long period spent reading a book or a magazine". However, reading on a digital platform is always interrupted by jumping from one page to another. Hence, it become discontinuous (ibid, p.18).
5. **Denise Murray**
   She focused on the sociological influences of technological revolutions .In this "Information Age" we live, she claims that modern readers will need special skills and strategies to read, criticise and interpret the volume of data they come across. Therefore, they need to be trained to approve of facts they read uncritically.

Literature Review

Reviewing related works in the literature shows that there is a lot of published work has been conducted in the field of traditional reading and on-line reading .Yet each study comes in different setting and follows a different manner. To start with, O'Hara and Sellen (1997) conducted a laboratory study comparing paper reading to on-line reading format. According to them, reality of day to day life shows that paper continues to be the preferred medium for much of our reading activity (p.235).To them, reading is a highly practised activity that forms a component of a wide range of different activities, and which serves many different purposes such as skimming rapidly, scanning, comprehension and reflection. Further, they state that

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annotation on-line results in making change to the original document, especially when doing these exercises: emboldening, italicising or underlining (ibid).

In a study conducted by Kol and Schcolnik (2000), it was found that students read as well from the screen as they do on paper. Based on an earlier pilot study they conducted, they decided to teach students techniques created to facilitate their reading practice on the screen. These strategies included the Find feature, the highlighter and a hyperlinked outline of the text so that they can scan and skim better and close-read. According to them (ibid), screen scanning is defined "as quickly searching for specific pieces of information by using the Find feature of the word processor" (p.70).On the other hand, screen skimming refers to "reading the hyperlinked outline provided, clicking the outline to access specific sections of the text, quickly reading and highlighting these sections, and scrolling to read the highlighted sections to get the main ideas" (ibid,p.70).

Aly et al., (2010), investigated online reading strategies by Omani EFL university first-year students and senior student teachers. Findings showed that high proficient readers use more global strategies than low proficient readers do. By global strategies, we mean, international and carefully planned by students to check their reading, such as having a purpose while reading, reviewing the text, checking how text content fits its purpose, noting text characteristics like length and organization, and predicting or guessing the text's meaning (p102) Also significantly, the study reported that first-year students used more support strategies than senior students did and that there was no statistically significant difference with reference to gender in either group.

A further study conducted by (Anderson, 2003), he tried to answer one of two questions on online reading strategies .This question was: Do the online reading strategies of English as a foreign language (EFL) differ from English as a second language (ESL) readers? By utilizing the online Survey OF Reading Strategies (OSORS), the results showed that there were no significant differences between EFL and the ESL groups. He defined EFL environment as "one where English is not the primary language of the society in which the language is being studied (p.12).ESL learning environment, on the other hand, is defined as "one in which English is used in the society in which the language is being used. An example of this is learners studying in Australia, Canada, England, New Zealand and the United States (ibid, p.12).

A related study by Akyel and Ercetin (2009) investigated the strategies employed by advanced learners of English while reading a hypermedia document, so that to find out whether these strategies are different from the ones reported in the literature of printed texts. Findings indicated that processing strategies utilized by advanced learners of English in hypermedia reading are not necessarily different from the printed texts. What is more, high prior knowledge readers exercise certain metacognitive strategies more frequently, while low prior knowledge readers used annotations that provided background information about the topic to make up for their lack of previous knowledge.

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Scanning a text for a key word can be a tedious and frustrating process because the final function does not take the readers directly to the desired location but, rather steps at every instance of the word in the text. On the other hand, paper reading goes directly to the text and avoid unnecessary steps (Kol & Schcolnic, 2000).Some of their recommendations is that every electronic text to include a hyperlinked outline as a navigational aid. Also, readers should have tools like a search facility and a digital highlighter. Nealson (1997) proposed methods of improving the scannability of web pages. Among others, he recommended the use of highlighted keywords and meaningful headings (as cited in Kol & Schcolnic, 2000).

Shabani et al. *(*2011) performed a study on reading behaviour in the digital age among postgraduate students from seven faculties of Isfahan University. This study tackled different areas of reading behaviour (based on the factors proposed by Liu, (2005), including the amount of annotating the electronic and print resources, the amount of printing out electronic documents for reading, and preference of reading medium. The study found out that the amount of reading of electronic media is highest among students of technical and engineering subjects.

In a study by (Bealty et al., 2009), four paths toward the development of a culture of reading were discussed from the perspectives of a teacher educator, a librarian, an educational technologist, and a curriculum developer. Jointly, these individuals examine common problems and solutions directing Arab students toward a reading culture with special reference given to the United Arab Emirates and the writers' host institution, The Higher College of Technology. They have found that most of the Emirati students are reluctant readers, especially if we consider the fact that these students have not grown up with the concept of a local public library system. They don't look at Reading as a social experience they can do and enjoy doing, rather they at the library as academic place especially designed to practice academic experience.

The Omani context is not far from the Emirati one as the two countries are geographically close and socially and culturally similar. "The Sultanate has a handful of public libraries accessible to the general public" (Abdulaal, 2013, p.6), but still they are not enough to meet the public needs. H E Dr. Samira al Moosa, the Sultanate's permanent delegate to UNESCO, hopes that opening the first Children's Public Library in Qurum, Sultanate of Oman will solve the problem of the shortage of public reading libraries that can be accessed by people generally and children particularly (ibid,2013).

Statement of the Problem

Students have to do a lot of reading for their assignments and academic studies. Today with the overflow of information and knowledge, students have to learn how to use the information well for their scholarly and academic work. At the present time, although we live in a print-based culture, digital media are ubiquitous and modern reading is taking a great and swelling part of our daily reading habits. Hence, every reader's behaviour is affected (Bleeker, 2010).It

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is for this reason; the current study is initiated to examine and investigate the impact of modern technology on reading behaviour.

Research Questions

The study sheds light on and examines two questions these are:

1. What are the differences that EFL students experience in reading behaviour when they do screen reading and paper reading?
2. What system (modern or classical) do students find more effective, user-friendly, authentic and more motivating in enhancing and developing their reading skill in an EFL context?

Research Objectives

This research paper aims at identifying the differences that EFL students experience in reading behaviour when they do screen reading and paper reading. Another objective is to find out what system (modern or classical) students find more effective, user-friendly, authentic and more motivating in enhancing and developing their reading skill in an EFL context.

The purpose of the study reported in this paper is to begin to answer these questions in a systematic, empirical way.

Methodology

Setting

The study is carried out at the Language Centre at Sultan Qaboos University. The Language Centre is a support and academic organization that is responsible for teaching English Language for all admitted students into Sultan Qaboos University (hereafter SQU).Also significant, more than 4000 students go through Foundation and Credit programmes each semester.

Research Instruments

Reflection diaries followed by qualitative semi-structured interviews, with willing participants, were utilized as research instruments to collect data from potential participants. As for the first instrument, the reflection diary included three sections. Section One was on participants' Demographic Information, Section Two asked the participants about their reading behaviour and practices. While Section Three contained some questions about the participants' daily reading behaviour, their reading format (screen or paper), the language they read with (Arabic or English) and their strengths and weaknesses about the reading experience.

As regards interviews, they were open ended question formatted, the interviewees were self-selected by their willingness to discuss the way they practice reading.

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Procedures

The researcher handled the responsibility of distributing the Reflection forms to the Sciences Programme participants, while my colleague Muna Al Thani distributed the instrument to the EES students and collected them back from them. It is worth mentioning that participants in both contexts (Sciences and Education) were trained how to fill the diary and were given a course of a week to fill them in and reflect on their reading practices.

Following that, the researcher conducted interview with some willing and volunteering participants from the Sciences Programme .These were three males and a girl. The interviews took place in the researcher's office, on campus, at the Language Centre and took 10 minutes per participant. The questions were opened ended ones prompted by the researcher. It is worth mentioning that the researcher had to translate some words and concepts to the interviewees to make them better understand.

Participants

The total number of participants in this study was 42 respondents. These were English Language Specialist students 18 (42.9 %) doing their English courses at the Language Centre (LC) and a sample of 24 (57.1 %) of Sciences Programme students doing their EAP (English for Academic Purposes) at the LC.

33 participants (78.6 %) reported that they used both Arabic and English languages when they read, while 4 (9.5 %) used Arabic and 5(11.9 %) used English. They mostly read for academic and entertaining purposes 35 (83.3 %).In contrast, 6 participants (14.3 %) read for academic purpose and 1 (2.4 %) read for pleasure respectively.

The format that these participants used as regards screen or paper, they reported the following results. Screen and paper users are 32 (76.2 %), while 5 (11.9 %) is distributed equally to both screen and paper reading. The time they spent on reading ranged between 15-25 minutes as minimum and 3 hours as maximum. Laptop computers come as number one device in the medium used for reading compared to desktop computers that gut only two users. On the other hand, tablet computers and smart phone device are worth an equal number of users 8 (19 %).

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Findings and discussion

Table 1: Reading behaviours practised by students

Reading Behaviour	Effectiveness			User-friendliness			Authenticity			Motivation		
Format	**Screen**	**Paper**	**Screen & paper**	**Screen**	**Paper**	**Screen & paper**	**Screen**	**Paper**	**Screen & paper**	**Screen**	**Paper**	**Screen & paper**
Having access to	51.2 %	46.3 %	2.4 %	67.6 %	24.3 %	8.1 %	11.4 %	82.9 %	5.7 %	39.0 %	51.2 %	9.8 %
Skimming	39.5 %	50 %	10.5 %	38.7 %	61.3 %	0 %	29.4 %	67.6 %	2.9 %	47.1 %	47.1 %	5.9 %
Scanning	41.5 %	53.7 %	4.9 %	58.8 %	35.3 %	5.9 %	36.4 %	60.6 %	3.0 %	47.1 %	44.1 %	8.8 %
Browsing	57.5 %	40 %	2.5 %	48.5 %	45.5 %	6.1 %	45.5 %	54.5 %	0 %	48.6 %	45.7 %	5.7 %
Highlighting	21.1 %	78.9 %	0 %	25.8 %	71.0 %	3.2 %	31.3 %	65.6 %	3.1 %	9.7 %	83.9 %	6.5 %
Bookmarking	17.1 %	75.6 %	7.3 %	24.3 %	67.6 %	8.1 %	24.3 %	73.0 %	2.7 %	32.4 %	62.2 %	5.4 %
Annotation & writing comments	33.3 %	64.1 %	2.6 %	30.3 %	66.7 %	3.0 %	26.5 %	73.5 %	0 %	42.9 %	54.3 %	2.9 %
Turning pages	41.0 %	43.6 %	15.4 %	52.8 %	38.9 %	8.3 %	25.7 %	68.6 %	5.7 %	38.9 %	52.8 %	8.3 %
Searching	82.9 %	7.3 %	9.8 %	91.7 %	5.6 %	9.8 %	62.9 %	31.4 %	5.7 %	77.8 %	22.2 %	0 %
Navigating	69.2 %	23.1 %	7.7 %	66.7 %	27.8 %	5.6 %	44.1 %	52.9 %	2.9 %	72.2 %	25 %	2.8 %
Immersing and focusing	27.5 %	25 %	2.8 %	27.5 %	67.5 %	5 %	35.1 %	62.2 %	2.7 %	47.4 %	47.4 %	5.3 %
Jumping and moving around the text	60 %	30 %	10 %	75.7 %	21.6 %	2.7 %	55.6 %	36.1 %	8.3 %	69.4 %	22.2 %	8.3 %
Understanding and comprehending	36.6 %	41.5 %	22 %	34.2 %	44.7 %	21.1 %	32.4 %	56.8 %	10.8 %	48.6 %	37.8 %	13.5 %

By examining the most popular reading practices, participants varied in their responses when asked to fill the above chart. Above all, screen users find having access to screen is more effective 51.2 % and user-friendly 67.6 %, while paper users believed that paper is more authentic 82.9 % and more motivating 51.2 %.In skimming, paper readers tend to think that paper is more effective 50 %, more user-friendly 61.3 % and more authentic 67.6 %.However, there is an equal response in that skimming in both platforms is more motivating 47.1 %.With regards to highlighting, bookmarking, annotation and writing comments, readers find it more effective, more user-friendly, more authentic and more motivating with paper that screen. Yet, readers have more affinity towards screen in turning pages, searching and navigating. Moving to immersing and focusing, paper readers find it so effective in dealing with a printed text than a digital one. Previous research offers confirmation of this finding. Mangen states that the digital text makes us read in "a shallower, less focused way" (as cited in Bleeker, 2010, p.16). Jumping and moving around the text has been a usual behaviour of screen readers. This practice has been observed by Giffard, calling it "zapping behaviour": where responsibility is placed on the reader to pick, choose and decide what to read. Last practice which is understanding and comprehending, the readers expressed

Inclination towards paper in being more effective, more user-friendly and more authentic, while they think screen is more motivating because of the added feature they can apply.

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Table 2: Physical feature of the medium

Physical feature of the medium	**Effectiveness**			**User-friendliness**			**Authenticity**			**Motivation**		
Format	**Screen**	**Paper**	**Screen & paper**	**Screen**	**Paper**	**Screen & paper**	**Screen**	**Paper**	**Screen & paper**	**Screen**	**Paper**	**Screen & paper**
Physicality and touching the	48.7 %	48.7 %	2.6 %	52.8 %	47.2 %	0 %	27 %	73 %	0 %	41.7 %	55.6 %	2.8 %
Functionality and practicality	46.2 %	46.2 %	7.7 %	45.7 %	48.6 %	5.7 %	34.3 %	54.3 %	11.4 %	54.3 %	34.3 %	11.4 %
Flexibility and spatial layout	67.6 %	27 %	5.4 %	48.6 %	40 %	8.6 %	57.1 %	37.1 %	5.7 %	60.6 %	33.3 %	6.1 %
Closeness or nearness	30 %	67.5 %	2.5 %	37.5 %	56.3 %	6.3 %	31.3 %	65.6 %	3.1 %	37.5 %	56.3 %	6.3 %
Lightness in weight	75.6 %	22 %	2.4 %	75.7 %	18.9 %	5.4 %	73.7 %	26.3 %	0 %	61.5 %	35.9 %	2.6 %

Respondents' answers show that the physical features of all screen medium make it attractive in terms of its physicality, flexibility and lightness .However, closeness and nearness to the paper text remain the only advantage that the readers enjoy having on a paper format. This clearly supports and go in line with previous published research in asserting that there is always a barrier between the reader and the digital text and distance existing is always "remote" as stated by Mangen.

Implications and Recommendations

It is hoped that findings of this study help suggest better library services for students and library users, in terms of researching and reading. More importantly, the results should aid course designers and teaching material writers to choose design, and consider the ongoing development as regards technology. Also significant, findings of the current study have offered recommendations to retain conventional strategies and develop technical strategies to assist students with reading electronic texts and teach them the specific skills needed just as we, educators, do with the traditional reading text (Walsh, et.al.2007).To date, we encounter the problem of not paying attention to content due to the increase in information loaded which in turn makes it hard to understand the meaning of written documents (Liu, 2003). Germane to this, "we and our students are bombarded with information" (Wilber, 2000, p.11).

Due to this fact, the researcher has proposed a Reading Model called TTRCAUE. This means students should be trained to Track knowledge and data in the right way, Read what they receive, Criticise knowledge, Accept facts, Use information and Evaluate the whole process.

Since university students are increasingly reading from the screen, the aim of my paradigms is to train them to read more effectively in this mode.

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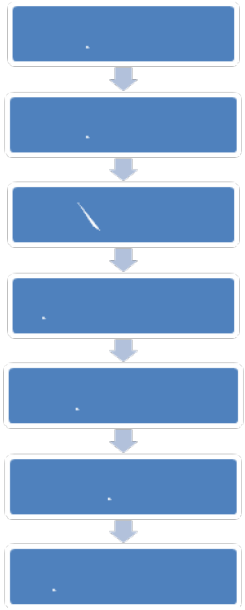

Figure 1. Online Reading Model

It is worth mentioning that all studies conducted on online reading strategies concluded that the learners transfer their print reading strategies to online reading (Akyel & Ercetin, 2009; Konishi, 2003; Elshair, 2002). Hence, beside the traditional strategies they transfer with them when they read, they also need to learn some technical strategies on the screen. These are:

General Tips for preventing eyestrain

These tips are offered by Kenner & Williams (2011):

- See an eye doctor.
- Take breaks by looking away from the screen every 20 minutes.
- Reduce glare.
- Reduce contrast on screen and with lighting (dimmer).
- Blink more often.
- Eyes' distance should be 20 inches from the monitor.
- Improve humidity or use artificial tears

Adjusting your computer to reduce eyestrain:

- Increase text size.
- Zoom in on your documents.
- Work in full-screen mode, allowing your eyes to focus on one task at a time.
- Adjust refresh rate of monitor to at least 50 times a second.
- Use windows XP ClearType.

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Suggested Programmes to reformat electronic text

These programmes can reformat and simplify web pages. Also, they can easily change font size and contents. Add to that, they can comfortably print and share simplified, clean versions.

Reformatting e-text:

- Copy and paste documents to MSW or make PDF doc.
- Change font, size or double space.
- Use comments feature for editing.
- Use highlighting feature for note taking.
- Print and use "traditional methods".

Metacognitive skills for online reading:

- Using speech software (naturalreaders.com).It reads aloud.
- Applying Online-Utility.org (Readability).
- Utilizing Wordle.net (word clouds for previewing articles).

Other helpful electronic tools:

- Reasy: reads highlighted section of website aloud.
- Wordia: multi-media dictionary.
- Evernote: online note taking programme.
- Think aloud: module shows approach to analyzing web articles.

Murray (cited in Bleeker, 2010) recommends that educators should shoulder the responsibility of teaching young readers how to validate and authenticate digital texts and how to cope with the ample quantity of data they are daily loaded with. She predicts that print will continue to exist along with the digital form (p.21).

According to the Interquest forecast (1997), "every 5-year-old today is likely to be using the Web routinely before finishing primary school". Kol and Schcolnic (2000) assert if this claim is proven to be accurate, the young generation will not require being taught and trained special strategies for effective screen reading when reaching adulthood. In this technology-centre environment, this hypothesis might be true. I believe, however, that there is no harm in testing it in the future and see whether our digitally minded students really need this training or not.

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Conclusion

Overall, this study was survey descriptive using the researcher-made reflection diary and semi-structured open –ended interviews. The data collection was accomplished using random sampling method. It has investigated the current changes happening to the reading behaviour in the digital age. A sample of students doing their English courses at the Language Centre were asked to reflect on their daily academic reading practices and fill a form of some guided questions on the matter. Following that, the researcher conducted some prompted interviews with the willing ones. The study concluded with come practical and pedagogical tips regarding academic and scholarly reading in this transitional phase.

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EMPOWERING THE PROFESSIONALIZATION OF NURSES THROUGH MENTORSHIP (EMPNURS) PROJECT

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The profession of Nursing, varies greatly in how it is both viewed by others and operationalised across Europe. In part, this is a consequence of the significant differences in the way nurses are educated. One important aspect of this educational experience is the contribution of qualified nurses in the supervision of student nurses during their clinical placements. It is noted that a crucial factor within nurse education systems should therefore be the educational relationship between the qualified nurses and student which would ensure successful learning experience. In many countries this is known as mentorship, and provision is made for the formal education of qualified nurses as mentors to students in the clinical learning environment. However, such approaches are not universal because the mentorship models used by organisations in these countries are relatively unknown in others; there are already countries where qualified nurses do not engage in this process at all. This is in part due to the different ways in which the nursing profession has developed in different countries. With the modernisation of European nursing education we now seek to address such incongruence, and in so doing, promote an empowered and better educated nursing profession across Europe.

The EmpNURS is an international project and it is aimed at benefiting nurse educators, student and qualified nurses. The thematic field of the project is in advancing empowerment of nurses and the operational focus is in Mentorship programmes and their delivery and enactment in the clinical environment. The Action model of the project is based on previous work by members of the project team (Saarikoski et al., 2008; Warne et al., 2010). Mentorship training courses will be developed and then implemented in four moderately new member states within the European Union. Each Mentorship course will be specifically geared to the cultural, professional and organizational needs of the participating partners. The anticipated project outcomes are: improved supervision skills of qualified nurses; a homogeneous range of Mentorship models which are adapted to specific nursing education needs in participating country; enhanced integration of education and practice organizations and promote congruity of European nurse education.

An impact evaluation of the EmpNURS project will be undertaken using both quantitative and qualitative methods, as well as an ongoing critical evaluation and support in the development of the mentorship programme. In particular the evaluation will assess the

increased cooperation between health care services and education, and the impact upon the professional empowerment of nurses especially in joining Higher Education Institutions (HEI) and hospital organizations. The EmpNURS seeks to create permanent interchange of shared beliefs and development in nursing education support system.

The EmpNURS consortium consists of 11 full partner organisations. Seven of these organisations are HEIs and four are teaching hospitals working in collaboration with each other. Organisations are located in Czech Republic, Finland, Hungarian, Lithuania, Romania, the Netherlands and United Kingdom. The mentorship pilot programmes, consisting of the including Mentorship training course for clinical staff nurses and their subsequent undertaking of the mentor role with students – will take place in Brno (CZ), Budapest (Hungarian), Kaunas (Lithuanian) and in Iasi (Romanian). There will be a collaborative team of a delegate from an HEI and a hospital, who will lead each of the four Mentorship pilot programmes. The role of the partners from Finland, NL and the UK will focus on supporting the implementation of the Mentorship pilot programmes. Turku University of Applied Sciences from Finland is the coordinator of the EmpNURS project.

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