
FLIPPED CLASSROOM FOR ACTIVATING STUDENTS IN ONLINE CLASSES

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Abstract

Learners' engagement and active participation have been seen as important issues, especially when talking about teaching and learning in blended or online classes. After the Covid-19 pandemic started, online teaching had to be implemented on a massive scale worldwide, requesting innovative instructional design solutions that would support teachers, engage learners, and allow online learning to be learner-centered. The literal transfer of traditional face-to-face classes to online classes resulted in significantly fewer active learning activities compared to traditional meetings. Therefore, the Erasmus+ project "Activating students in online classes" aims to introduce the potential of flipped classroom methodology in online teaching. This paper presents the Active Class project which aims to help academic teachers in their online classes, by suggesting methods, tools, and opportunities that improve their qualifications and build a new standard of blended and/or online teaching.

Keywords:

The flipped classroom, online teaching, students' engagement, online classes, higher education.

Introduction

Despite the challenging pandemic period, it is unnegotiable that this period had a significant impact on the establishment of online learning in higher education institutions. As researchers of the Active Class project noticed, while most of the HE teachers overcame technical challenges rather quickly and improved their digital competencies, the biggest challenge appeared to be the lack of knowledge on how to design and deliver the online course in a way that would be interesting and engaging for students. Next to the lack of didactic skills related to online teaching, Bates (2022) claims that HE teachers face new challenges when working with a higher number of students and bigger groups of learners, resulting in a more teacher-centered lecture with little interaction rather than learner-centered teaching and learning. Therefore, the Active Class project among other outputs aims to create teacher training materials and examples that would provide teachers with some inspiration and instructions on how to make their online classes better and activate students during these classes. Within the project framework, the flipped-classroom methodology is seen as an innovative way to design more engaging and student-centered learning experiences. As claimed by Cao and Swada (2020), the flipped classroom allows teachers to focus more on in-class peer collaboration activities rather than instruction delivery, and since learners analyzed pre-class learning material, they could focus more on discussions of unclear content while being in class. Next to this, learners' engagement and their learning depend on the active learning environment that should be designed to meet learners learning styles, needs, and expectations (Burke & Fedorek, 2017). Responding to these issues, the Active Class project, next to other results, aims to develop a training material that would support and empower teachers to reflect on their classes and search for new solutions to engage flipped classroom approach, by revising or redesigning the course or topic accordingly. The training for teachers is focusing on theoretical and practical aspects of the flipped classroom integration into online teaching practices, as well as recommendations for the use of digital tools that foster learners' engagement in learning and supports online teaching. An international group of experts from 3 European Universities has been working consistently to deliver high-quality results that would serve higher education teachers.

Another important aspect is that HE institutions involved in the project are also partners within the framework of the European University Transform4Europe – T4EU alliance. While T4EU among other activities assumed to create joint study programs in the areas of computer, environmental and social sciences, it does not focus on revision of online teaching and learning methods. Therefore, such initiatives as the Active Class project may contribute to the quality of online teaching, bringing added value to all collaborative universities, as the courses that have been re-designed using flipped classroom approach would be introduced to students from the Alliance universities.

The overall goal of teachers, participating in the Active Class project, is the activation of students in online educational contexts. Thus, the innovative combination of didactic methods, good practices, and technological tools, to be used in online teaching and learning, were created and training for teachers was suggested. More importantly, HE teachers were fostered to reflect on their online teaching strategies and pre-design a course or a topic that would engage students more easily in the active learning process. The flipped classroom methodology was chosen as an innovative instructional approach to be applied in online teaching. The flipped classroom is understood as "...a set of pedagogical approaches that (1) move most of the information-transition teaching out of class, (2) use class time for learning activities that are active and social, and (3) require students to complete pre-class and/or post-class activities to fully benefit from in-class work" (Abeysekera & Dawson, 2015).

The scope and outputs

Even though flipped classroom instructional design is not innovative per se, the researchers in the Active Class project aim to introduce it with the components of gamification and various online tools that facilitate active learning. To ensure the consistent introduction of how to design, plan and deliver flipped learning in online classes so it activated students' participation, 5 intellectual outputs were planned to be delivered during the project implementation period:

1. Flipped classroom e-methodology,
2. Teachers' training material,
3. Demo scenarios,
4. Best practices package,
5. T4E tracks scenarios.

By now (September 2022) 4 outputs have already been developed, presented for HE teachers of participating institutions, and published online, while T4E tracks scenarios are in the development process.

Flipped classroom e-methodology

As the flipped class methodology is not new, teachers need guidance on how it may be used in online teaching, with a focus on active students. Thus, the researchers developed a document focusing on the online teaching and flipped class approached and called the methodology "Flipped classroom-based e-methodology". It is based on two teaching methods: flipped classroom method and gamification. It is important to note, that flipped classroom methodology turns Bloom's taxonomy pyramid upside down, where activities related to remembering and understanding happen outside of the class (individual studying) and then active learning activities focusing on knowledge application, analysis, evaluation, and creation are organized in class (see Fig. 1).

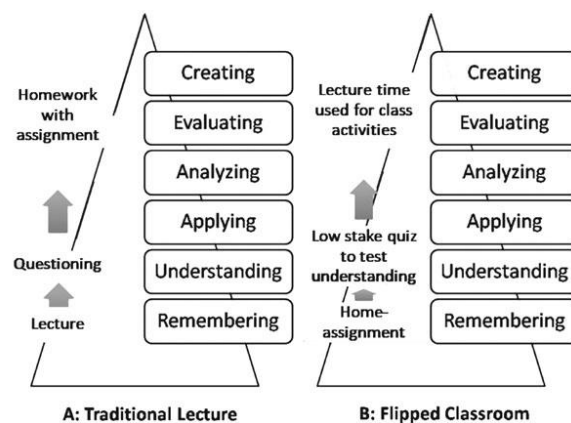


Figure 1. The process of a traditional classroom (A) vis-à-vis flipped classroom (B) is aligned with revised Bloom's taxonomy (Singh, Mahajan, Gupta & Singh, 2018)

As it is seen in the figure above, flipped classroom prompts the change of teacher's role, meaning that teacher-centered classes when theoretical input is presented by the teacher mainly, transform into student-centered

learning, when students are actively engaged in learning and the teacher becomes a coordinator and moderator, providing support for students during their activity development.

The supporting method which is combined with the flipped classroom in this project is gamification, ready to use on every level of Bloom's taxonomy pyramid. Aiming to create an innovative and interactive methodology, and activate students' during online classes, all the cases and scenarios developed on the base of this methodology and presented in the outputs, are supported with various online teaching and learning tools.

To sum up, e-methodology introduces key artifacts of flipped classroom methodology, like student-centered learning, active learning, learning outcomes, and assessment principles, as well as presents key aspects of gamification, and provides recommendations for flipped learning design solutions, limitations, and weaknesses of this methodology.

Teachers' training material

The teacher training material is developed based on the "Flipped classroom-based e-methodology" presented above. This training material aims to help teachers improve their skills in the development of online classes, providing them not only with the main ideas of flipping the class but also with a list of tools and activities that guide teachers in improving their courses by revising of most complicated course topics and improving students' learning of these topics using more active learning methods. This also creates the possibility for teachers to improve their qualifications and build a new standard of online teaching. Next to this, training materials help teachers to start using flipped classroom methodology as lots of ready-to-use templates are provided and can be adapted.

As was mentioned, flipped classroom focuses on active learning and learners' engagement by removing the teacher itself from the center of attention and limiting the use of the lecture method (direct transition method), and, instead, creating conditions for active students' learning. In a flipped classroom students have to analyze and study learning materials and acquire knowledge independently, so that during the class, with the guidance of the teacher, students could build their cognitive schemas and knowledge. In such a case, the teacher no longer acts as a knowledge transmitter but as an architect of students' knowledge.

The main aim of the training material is to guide a teacher in flipping the class in online course delivery. The training material consists of 4 units, covering theoretical learning resources, 6 individual assignments, and questions for a self-assessment quiz or self-reflection. The topics of the training material are focusing on: (1) key features of a flipped classroom methodology, (2) defining learning outcomes in a flipped classroom, (3) guidance on organization and assignment planning in the flipped classroom, (4) guidance on choosing online tools, (5) assessment strategies of a flipped classroom activities, (6) open educational resources, ethical and legal issues, (7) presentation of best practices and demo scenarios, and (8) quality assurance and course assessment of the (re)designed online courses. The main assignment that is to be prepared during the training is a revised flipped classroom lesson/course plan, where teachers are recommended to revise the learning outcomes, activities, theoretical material, and assessment strategies, and with the support of tutors, search for the possibilities to flip one or several topics to be delivered in a flipped way. Each assignment was described in detail so that it would be easier for any teacher or education specialist to follow the course independently (see Fig. 2)

Day 1 Assignment No 1. Revision of course outcomes and activity planning

Aim of the assignment	to revise your course outcomes and select which outcome(s) require(s) more active learning methods and can be achieved using flipped classroom approach.
Steps to implement	<ol style="list-style-type: none"> 1. Choose the course you would like to improve 2. Based on the presented theoretical guidance (see slides of Unit 1.1 and Unit 1.2) revise your course learning outcomes to select which may be improved if more active learning methods/flipped class activities were applied. Think of the activities that could support pre-class and in-class learning. 3. Start filling in the provided lesson/course plan (see lesson/course plan in Annex 1) and fill in part I.
Expected result	The learning outcome is described in a lesson/course plan template (Part I).
Self-assessment quiz	<p>To create active learning in a flipped classroom, teachers should:</p> <ul style="list-style-type: none"> ○ Have students work independently on writing assignments ○ Create quizzes and tests that require students to apply their knowledge (+) ○ Present theoretical material during the class and ask students to write an essay at home <p>Which is not an active learning activity?</p> <ul style="list-style-type: none"> ○ Analysis ○ Presentation ○ Lecture (+) ○ Discussion <p>Which of the following does not show learners' engagement?</p> <ul style="list-style-type: none"> ○ Questions raised in class ○ Participation in the discussion forum ○ High grades and test results (+)

Figure 2. Example of an assignment description and self-assessment quiz questions

Finally, to ensure the quality of flipped courses, teachers were introduced to a questionnaire helping to assess the course and at the same time stimulate teachers' self-reflection. It is constructed of 8 question blocks each of which encompasses more detailed criteria for a course evaluation:

1. Competences/learning outcomes and their consistency (5 criteria)
2. Learning methods (5 criteria)
3. Presentation of the theoretical material (10 criteria)
4. Assessment methods (5 methods)
5. Description and presentation of the assignment (7 criteria)
6. Learning organization (6 criteria)
7. Synchronous and asynchronous tools and support (5 criteria)
8. References, copyrights, and attribution (4 criteria)

The overall of 47 criteria are included in the questionnaire, so the assessment would be consistent and focus on key elements of the online classes. The questionnaire is developed in a way that would be easier to assess the course quality for both, the teacher, and the external expert or peer reviewer (Fig. 3).

Figure 3. Extract from the training material - presentation on the quality assurance

Based on the developed teacher training material training for teachers may be organized, or self-learning by university teachers may be encouraged.

Demo scenarios

For the teachers to see some examples of courses, which were created using flipped classroom e-methodology, a collection of demo scenarios focusing on 3 study areas (computer, social, and environmental studies) was created. These demo scenarios aim to demonstrate the template or good structure of a well-developed online course, which follows flipped classroom e-methodology. They include some theoretical background and pre-class and post-class activities that engage and activate students. Teachers who prepared demo scenarios demonstrated different digital tools that help them to activate and engage students in online classes especially. For example, the presented case of the course from the environmental study field introduced an interactive decision-making game RuFOPOLY (Fig. 4) which received a lot of interest from other training participants.



Figure 4. Presentation of the RuFOPOLY interactive board game on a virtual learning environment Moodle

The demo scenarios help higher education teachers to understand and gain ideas on how to prepare their online classes so that they would be both, flipped and engaging. Therefore, 3 demo scenarios are developed in the study areas mentioned above responding to the specificity of the discipline and the specificity of the virtual learning environment for the online learning process. These demo scenarios of flipped teaching in online classes are also expected to become a model for teacher training as well as for the development of other online classes proposed to all students of the T4E Alliance.

Best practices package

To provide more examples for teachers, the presentations of some of the best practices for applying the flipped classroom methodology in higher education were also created. It is believed that this collection will serve as guidelines for academics, based on the tested modern digital teaching methods and containing descriptions and examples of practical application. One of the key reasons to develop these practices is the need for solutions and examples on how to make the teaching material more attractive to students for them to become active participants in the learning process. Best practices present different scenarios of how flipped learning might be designed and delivered in daily teaching practice, offering practical solutions on how to plan the time and distribute pre-class, in-class, and post-class activities, what digital tools to use, and similar. Figure 5 presents the possible flipped teaching and learning scenarios.

Before Class: Listening & Writing

Watch the digital video on *The swinging Sounds of Gatsby*. Take notes and answer the questions.

How important is music for the film producer Baz Luhrman?

What have you learnt about making the music for the film?

How does the music sound?

Have you ever heard the performers before?

Have you seen the film discussed?

<https://youtu.be/l2sCCU9-0g>

In-Class discussion: Flipped classroom (20 - 30 min)

1. Listening, Writing & Speaking.

Watch the following presentation on Modernism. Go to Slideshare and open the presentation on Modernism. Answer the questions:

•How is Modernism defined?

•Compare this definition with the definition of the American historian Robert Wohl that I quoted in the video instruction.

•Name five characteristics of Modernism.

•The Lost Generation is used to describe...(finish the sentence with meaningful information)

<https://www.slideshare.net/valentinaandrade520/modernism-period>

Figure 5. An example of the pre-class and in-class activity planning in language classes

Apart from knowing how to arrange and design the learning, teachers need to be aware of the new digital methods when applying flipped learning in online classes, e.g., recording presentations with a voice recording or short lectures in video format, dividing learners into smaller groups in video conferencing system, creating short and quick quizzes for assessment, and arranging collaborative group work using shared documents. An example of the teaching and learning design of a flipped class presented in Figure 6 demonstrates how multiple digital tools can be used to support pre-class, in-class, and post-class activities of only 1 online class aiming to activate and engage learners.

<p>Pre-class Students are asked to:</p> <ul style="list-style-type: none"> • watch 2 videos • watch a pre-recorded lecture • listen to extraction from a podcast • read a blog entry of a field expert • write down keywords that emerge as the most relevant and important when talking about open education • join the discussion forum on Moodle and answer 4 questions related to the content 	<p>In-class</p> <ul style="list-style-type: none"> ✓ Q&A session (10 min.) ✓ Group work on questions answered before the class in Moodle (15 min) + presentation (15 min) ✓ Group work – creating concept map on what open education is (15 min) + presentation (15 min) ✓ Discussion (10 min) ✓ Exit ticket 3-2-1 ✓ All results developed by students are uploaded on a shared document so that all students could have access and analyse.
<p>Post-class</p> <ul style="list-style-type: none"> ✓ Short quiz ✓ Short essay on how open education may foster lifelong learning 	<p>Online tools and platforms used:</p> <ul style="list-style-type: none"> • Mindmup (https://www.mindmup.com), • Mentimeter (www.mentimeter.com) • Padlet (www.padlet.com) • Google forms • GoogleDocs • MsTeams • Moodle

Figure 6. An example of a teaching and learning design supported by digital tools in the online class

Multiple tools can be used to support online learning, including the ones mentioned in Figure 6, as well as Prezi, Screenr, Kahoot, and others. It is up to a teacher to decide how their pedagogical goals could be supported with a digital tool. Nevertheless, teachers need to have a sufficient level of knowledge on how to use a specific tool to organize active learning successfully.

T4E tracks scenarios

It is the final output of the Active Class project which is complementary to a Transform for Europe Project. Teachers who are participating in training about the flipped classroom e-methodology are asked to prepare scenarios in the crucial fields of the T4EU project: computer, environmental, and social sciences. The users of scenarios will be teachers of all T4EU consortium universities. These scenarios will help all the teachers from the Alliance in their online teaching practice by giving methods, and tools on how to make their online teaching more engaging and interactive using flipped classroom methodology. It is an ongoing output, and the results will be presented as soon as it is finished.

Concluding remarks

Higher education teachers involved in the development of best results, demo scenarios, or participating in the training, confirm that while the flipped classroom is seen to be a useful way to use in-class learning time for more

active learning activities, the application of it is rather challenging. The challenges refer to the lack of knowledge about the possible digital tools that support online learning and the challenges to design and plan online learning activities and assessment strategies. At the same time, teachers notice that flipping the class is time-consuming since it requires extra time to pre-plan learning material that would be consistent with the in-class and post-class activities. Therefore, teachers need to be experts in their teaching content so they could organize active learning activities in online classes successfully.

The flipped classroom methodology is proved to be a useful way to activate learners in online classes. As it was noticed, flipped learning is not just about transferring more responsibility of the learning to students themselves. To succeed with flipped learning, teachers need to be experts in the learning content and the learning material that students are analyzing before the class so that when needed, the teacher could give some recommendations and moderate the discussion easily by emphasizing the key points important for students to learn. Next to this, when planning flipped teaching and learning, teachers designed metacognitive strategies that helped students to reflect on their learning, apply their knowledge and make the learning that requires the highest level of cognitive load to be less stressful.

The results delivered within the Active Class project so far have confirmed that the flipped classroom methodology helps teachers to engage students in online classes easier. However, it is important to emphasize, that the success of flipped classroom application in teaching depends on the teacher's pedagogical, technological, and content knowledge, as well as on institutional and faculty support.

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