Extending Design Thinking with Emerging Digital Technologies, *EXTEN.(D.T.)²*

Marcelo Milrad

marcelo.milrad@lnu.se

March 9th, 2023

Co-funded by
the European Union

Linnæus University

Partners

Participant No. *	Participant organisation name	Country
1 (Coordinator)	Linnéuniversitetet / Linnaeus University (LNU)	Sweden
2	Ethniko kai Kapodistriako Panepistimio Athinon (NKUA)	Greece
3	The Open University (OU)	UK
4	Universiteit Gent (UGent)	Belgium
5	Norges Teknisk-Naturvitenskapelige Universitet (NTNU)	Norway
6	Trinity College Dublin (TCD)	Ireland
7	Filothei Chalvatza (Simple)	Greece
8	University College London (UCL)	UK

Setting the Context

- 21st century skills & 21st century digital skills
- Digital Competence
- Integrating emerging technologies into schools' curricula
- Computational Thinking (CT) across domains
- Teachers´ professional development
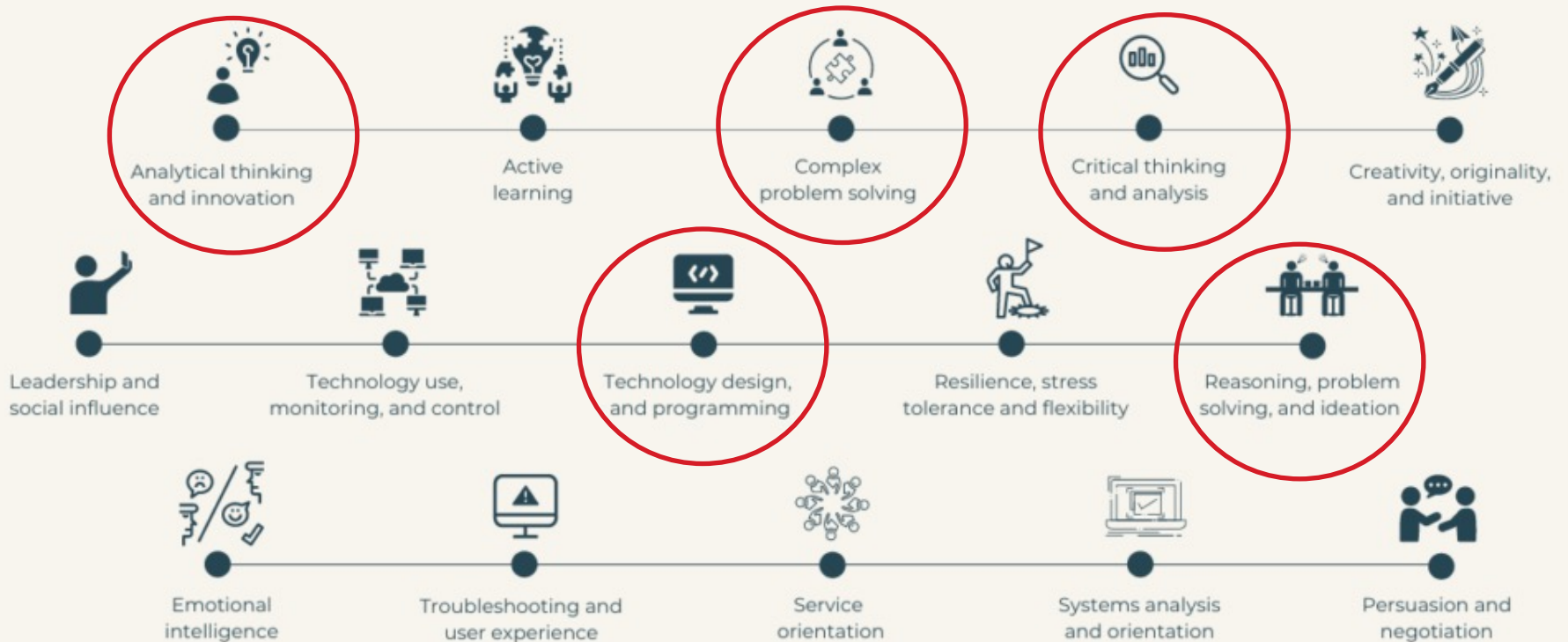- Sustainable innovation

Global Challenges 2022 and beyond

Come together to achieve
Health For All

XXI Century Skils

WORLD ECONOMIC FORUM

TOP 15 SKILLS FOR 2025

Analytical thinking and innovation

Active learning

Complex problem solving

Critical thinking and analysis

Creativity, originality, and initiative

Leadership and social influence

Technology use, monitoring, and control

Technology design, and programming

Resilience, stress tolerance and flexibility

Reasoning, problem solving, and ideation

Emotional intelligence

Troubleshooting and user experience

Service orientation

Systems analysis and orientation

Persuasion and negotiation

WORLD ECONOMIC FORUM

www.designingschools.org

Our Value Proposition

EXTEN.(D.T.)^2 uses *emerging technologies* to enhance the pedagogical value, sustainable digitization and potential for wide deployment of *Design Thinking (DT)*.

DT is a promising transformative pedagogical innovation based on engaged interdisciplinary learning and the growth of 21st-century skills for everyone, through entrepreneurial co-creation.

Like other such innovations however, it has yet to pull its potential weight in terms of impact in educational transformation.

# Building Innovation by the Integration of Existing Tools & Technologies

- ## MaLT2
  Machine Lab Turtlesphere
  powerful ideas in the foreground

- ## ChoiCo
  Choices with Consequences
  - powerful ideas in the background

- ## SorBET
  - Sorting with a Tetris-like Game
  - powerful ideas in time-critical contexts

- ## Cyberbotics
  - Simulating robotics with digital media
  - Programming and engineering online

- ## nQuire
  an educational tool for designing
  and managing studies with students
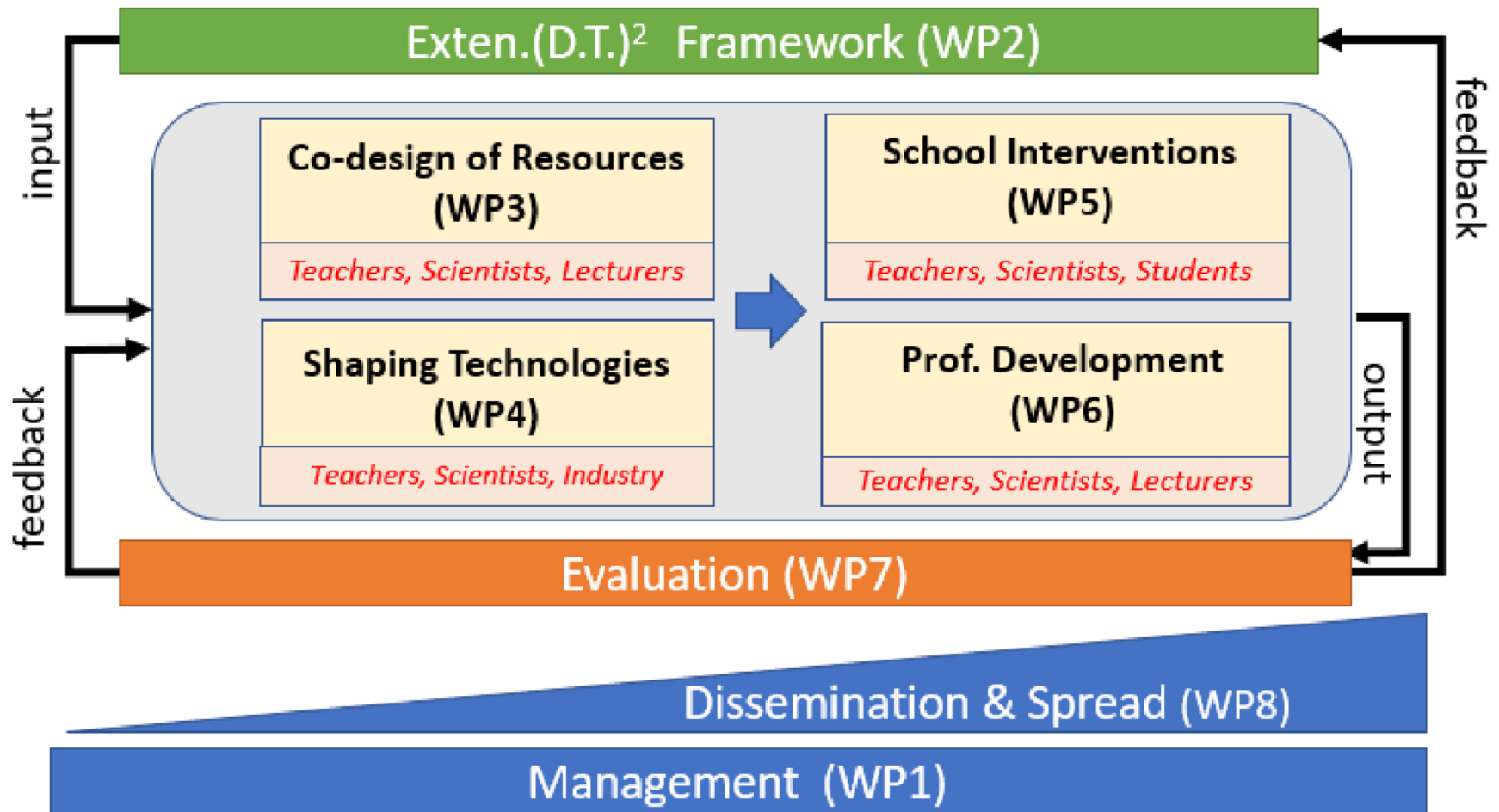
The Emerging Technologies

- Augmented Reality
  - Embodied interactions

- 3D printing
  - Rapid prototyping of physical artifacts

- Learning Analytics
  - What is capture-worthy and appropriate

- AI and feedback
  - Authorable feedback and display

Putting it all Together
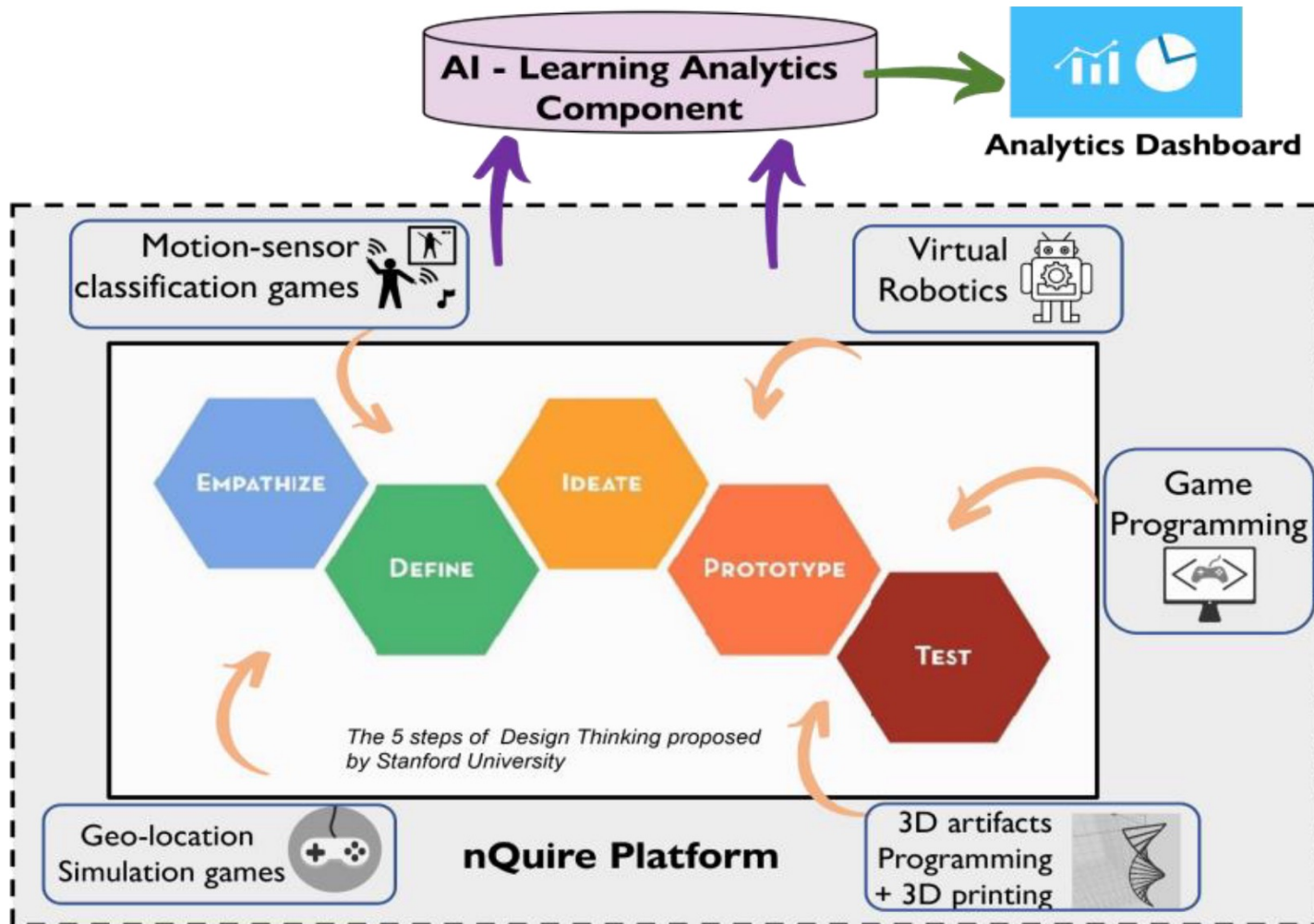
Structure of our Work

Expected Outcomes

Implemented/developed in different social contexts across 6 European countries, EXTEN.(D.T.)[2] will explore the risks and potential of the pedagogical use of ET and how they support 21C skills, in turn increasing the scope, transformative potential and applicability of DT with ET in mainstream schooling.

EXTEN.(D.T.)[2] will invite and inspire teachers and other stakeholders to design and implement such innovative educational projects, by running original strategic teacher professional development, providing courses and guidelines for them to design, implement and evaluate DT projects in their classrooms.

During the entire the lifetime of the project, we expect to maintain active and sustainable connections with educational institutions and policy-making institutions across 6 European countries.
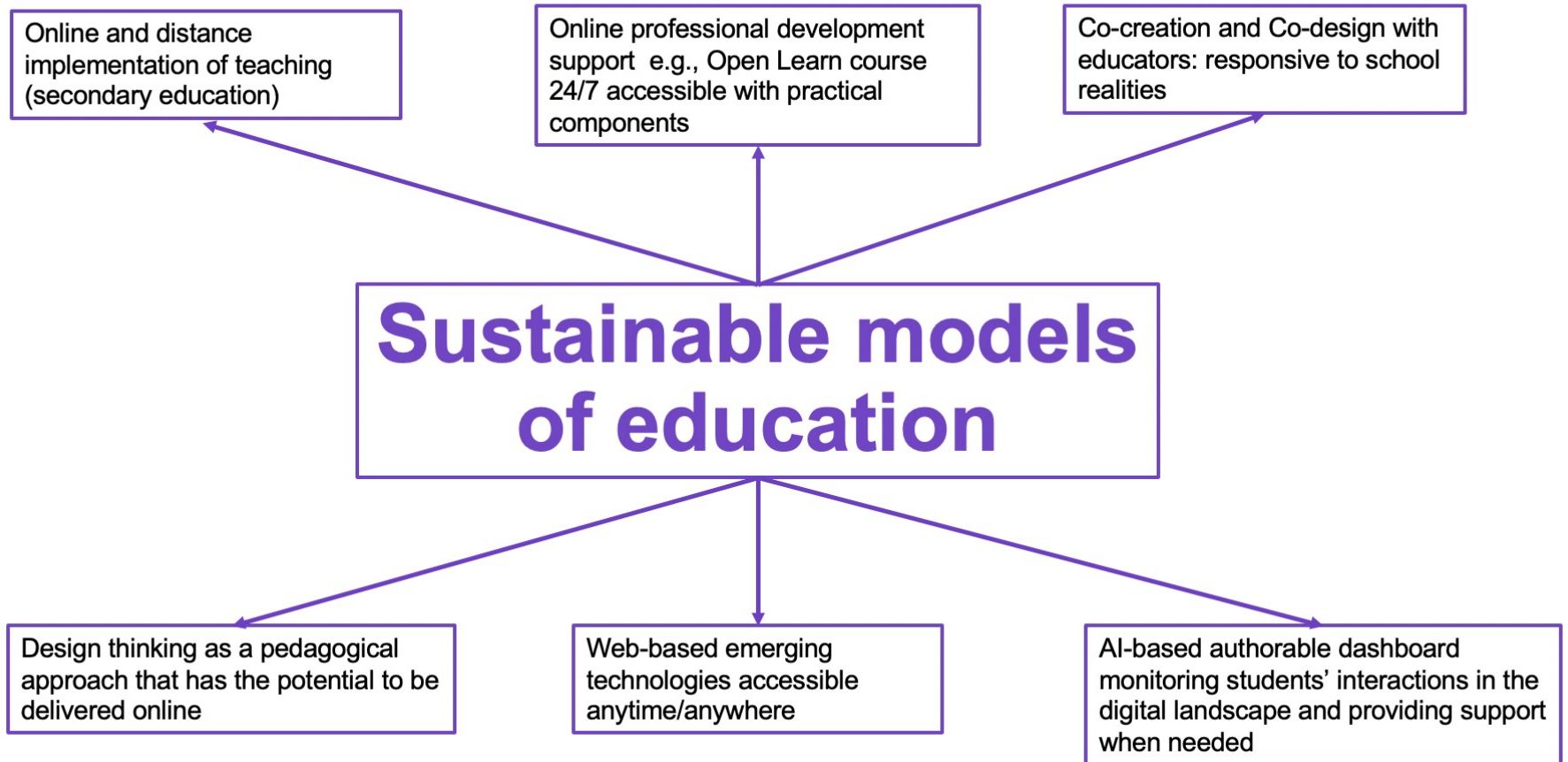
Educational Innovation

Challenges

Understanding the meaning of the sustainability components discussed by Ng & Nicholas (2012) and their implications for research, design and implementation:

(1) economic sustainability

(2) social sustainability

(3) political sustainability

(4) technological sustainability

(5) Pedagogical sustainability

(6) Design sustainability

(7) Knowledge Management sustainability

Why is this important?

Our view on sustainable innovation

Exten DT²

Online and distance implementation of teaching (secondary education)

Online professional development support e.g., Open Learn course 24/7 accessible with practical components

Co-creation and Co-design with educators: responsive to school realities

Sustainable models of education

Design thinking as a pedagogical approach that has the potential to be delivered online

Web-based emerging technologies accessible anytime/anywhere

AI-based authorable dashboard monitoring students' interactions in the digital landscape and providing support when needed

Research Challenge

- Goodyear (2011) claims that we are facing two perceptible changes in the field of educational research. The first is a shift in our sense of the spaces and contexts in which education takes place, as different learning activities are becoming more commonly distributed *across a variety of contexts*. The second change is a wider understanding with regards to the conception of educational praxis, acknowledging *the growing importance of design.*

Goodyear, P. (2011). Emerging Methodological Challenges. Book chapter in Markauskaite, Freebody & Irwin (Eds), *Methodological Choice and Design*, Volume 9, Part 4, pp. 253-266. Springer Netherlands.

Collaboration Opportunities

- Knowledge exchange

- Common activities

- Public Outreach

- Hands-on workshops at international events

- Common publications

Contact Information:
Dr. Marcelo Milrad, Professor
Department of Computer Science & Media Technology
Linnaeus University, 351 95, Campus Växjö, SWEDEN
E-mail: *marcelo.milrad@lnu.se*

https://extendt2.eu/

Linnæus University