Transforming Education through Emerging Technologies (MA)

Aim of training

Aim of the study program:

Emerging technologies have capabilities that enable sophisticated and powerful forms of learning by supporting distributed cognition, situated learning, diagnostic assessment, psychological immersion, modelling, visualization, collaboration and community. The aim of this course is to help students develop a greater knowledge about the ways emerging technologies can empower learning in and out of classrooms. Students will examine a range of educational technologies expected to become important applications within the next years as well as the potential of these emerging technologies to improve practice and alter the mission and content of education. Challenges to implementation and educational equity posed by emerging technologies and strategies for overcoming problems will also be discussed.

Expected learning outcomes and related competencies

Knowledge:

On successful completion of this course, students will:

- develop knowledge about a broad spectrum of current leading-edge research in educational technology
- better understand how the affordances of information technology aid the educational process

The completion of the course contributes to the following aspects of professional knowledge:

- Has knowledge of the latest results of research in education science and its neighbouring fields and the relevant pedagogical innovations; and can analyse and interpret them critically.
- Has deep knowledge of scientific theories of learning, the strategies and methods of learning and the methods of supporting learning and teaching.

Skills:

By the end of the course, students will be able to:

- discuss how innovations such as hypermedia, intelligent tutoring systems, shared virtual environments, multisensory immersion, computer-supported collaborative learning, knowledge networking, and modelling and visualisation can support improved teaching and learning
- delineate the likely evolution of information technology in education over the next decade
- describe the challenges to educational equity posed by emerging technologies and strategies for overcoming these problems
- assess the challenges of integrating advanced technologies into educational practice and plan strategies for overcoming these problems
- assess the challenges of integrating advanced technologies into educational practice and plan strategies for overcoming these barriers

The completion of the course contributes to acquiring the following professional skills:

- Applies the interdisciplinary models and can analyse a certain problem from different perspectives that enables the realistic interpretation of the situation with effective alternative solutions.
- Can formulate practical implementation proposals.
- Can plan and carry out smaller research projects independently or in a group.
- Can prepare professional materials based on independently chosen aspects, to present and analyse research results with objectivity, to write shorter professional texts independently.
- Can interpret professional scientific discourses and to compare arguments of different viewpoints.
- Can communicate adaptively in professional environments and pedagogical situations and can lead situations of professional communication.

Attitude:

Students will develop:

- critical, creative and reflective attitudes towards emerging technologies in education

The completion of the course contributes to development of the following professional attitudes:

- Aims to implement expansive professional cooperation, is open to enter reflectively into problematic situations and can judge them professionally.
- Has professionally established critical approach and committed to professional analysis based on values and knowledge.
- Seeks creative solutions for deep comprehension of certain topics, applying the relevant research methods, is open towards cooperation in research, realizes the importance of joint work.
- Approaches connections of theory and practice with evaluative and interpretative reflectivity. Formulates relevant professional criticism, explicates his/her opinion convincingly and clearly, can argue in professional debates.
- Stands for the importance of communication in pedagogical and professional work, considers important to utilize the potentials of information technology tools.

Autonomy and responsibility

The completion of the course contributes to the following areas of professional autonomy and responsibility:

- Can work independently and with responsibility.
- Takes the proactive role in making phenomena understood, encouraging responsible thinking and applies a scientific-professional viewpoint in his/her decisions and actions.
- Makes individual decisions based on professional opinion, and prioritizes delivering opinion and acting based on research.
- Is a reliable professional partner in various professional collaborations, can both lead and follow effectively in cooperation.

Main topics

Main contents
1. General overview of emerging technologies
2. Important developments in educational technology, their learning potential and impact on education and schooling: Makerspaces, 3D-printing, robotics, wearable technologies, analytics technologies, Virtual Reality, Augmented Reality, Artificial Intelligence, Internet of Things
3. Redesigning Learning Spaces to support sophisticate learning powered by emerging technologies
4. Educational challenges posed by emerging technologies

Planned teaching and learning activities
This course is designed to encourage learning by a combination of lectures, hands-on experiences, media, guest speakers, field trips, discussions, and projects to help students understand how emerging technologies can empower learning in and beyond the classroom.

Evaluation

Requirements, type and aspects of evaluation
Each of the following assignments will be given a letter grade and weighted as follows:

Online reflective journal tasks (due on weeks 4 and 8) on what has been learnt in the course and future expectations (20%)

Scholarly paper synthesizing the merits, barriers to implementation, and likely impact and evolution of an elected emerging educational technology based on the research literature and hands-on usage experience (if feasible) (80%)

Course grades:
5 (100-90%),
4 (90-80%),
3 (80-70%),
2 (70-60%),
1 (below 60%)

Reading

Required reading:

Fishman, B. & Dede, C. (2016). Teaching and technology: New tools for new times. In D.H. Gitomer & C. A. Bell (Eds.), Handbook of research on teaching (Fifth edition) (pp. 1269-1335). Washington, DC: American Educational Research Association.

Liu, D., Dede, C., Huang, R., & Richards, J. (2017). *Virtual, Augmented, and Mixed Realities in Education.* Singapore: Springer.

Mouza C., Lavigne N. (2013). *Emerging Technologies for the Classroom. Explorations in the Learning Sciences, Instructional Systems and Performance Technologies*. New York, NY: Springer