Background information

Seminar "Opportunities and Challenges of Learning with Technologies: Evidence-based Education"

Status quo

The "Europe 2020" Strategy states that one in seven young people leave education and training too early, and that less than one person in three aged 25-34 has a university degree compared to 40% in US.[1] In the times of digital society, where the majority of European citizens are using smartphones and have online access[2], Europe should seize the opportunities provided by information technology. Statistics showcased in the Europe 2020 strategy present the need for smart future growth – an economy and education based on digital solutions and information.

European Commission supporting innovative learning policies

The 2013 communication of European Commission "Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources" sets out an European agenda for stimulating high-quality, innovative ways of learning and teaching through new technologies and digital content, giving out recommendations for Member States to achieve goals set in the Europe 2020 strategy, and EU flagship initative Digital Agenda.[3] Key Transformative Actions of European Commission highlighted in this area include the support for educational institutions in developing new educational models and testing innovative pedagogical approaches, curriculum development and skills assessment. In addition, the Commission aims to support the professional development of teachers through massive online open courses (MOOCs) and to develop measuring tools for monitoring the integration of ICT in teaching and training institutions for further evidence-based policies. Developing new teaching and learning methods by using solutions based on digital technologies would provide users with personalised learning experiences. This can lead to more educated labor force with technological and other transversal skills, who are able contribute to solving the skills gap and societal challenges Europe is facing in the current state of technological revolution.

European Parliament, protecting the interests of European citizens, has been a keen supporter of creating digital solutions and making them accessible throughout Europe, while improving the quality and efficiency of education and training. Parliament has worked successfully to secure an increase in the budget resources available for existing programmes in the field of education and training (e.g. Erasmus+), and has been a keen advocate for shifting the priorities of EU funding in the next Multiannual Financial Framework (MFF), demanding clear budgetary allocations for education and training, youth, sport and Jean Monnet programme activities.

Member States (MS) are expected to support innovative teaching and learning environments and ensure that transparency and recognition instruments for formal education are adapted to the new form of learning, including validation of skills and certifications acquired online. MS should stimulate open access policies and ensure the connectivity of individual classrooms to broadband, making sure that students have access to modern ICT equipment and open national learning repositories.

Actions to support ICT-based education in Estonia

Despite efforts by the EC and Member States, the business potential for educational software and learning content in Europe remains largely untapped. Estonia started to heavily invest in development and expansion of computer and network infrastructure already in 1997 through a project called "Tiigrihüpe" or "Tiger's Leap", through which the whole computer park was renewed in Estonian schools and that helped to result in developing and using educational e-solutions, for example the highly successful "e-school" environment. Though, there are also many great examples from European Universities, including Tallinn University, that has prioritized developing innovative solutions in it's Centre of Educational Technology (HTK)[4] and implementing them with the competence of it's Centre of Innovation in Education[5]. The main ongoing research projects in the HTK are related to the development of the next-generation of distributed learning environments involving

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[1] Europe 2020 Strategy - ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf

[2] GSMA Survey file://localhost/- http/::gsmamobileeconomyeurope.com:GSMA_Mobile Economy Europe_v9_WEB.pdf

[3] European Commission's communication Opening Up Education - http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013DC0654&from=EN

[4] Tallinn University Centre of Educational Technology - http://htk.tlu.ee/new/about/profile/

[5] Tallinn University Centre of Innovation in Education http://www.tlu.ee/en/centre-for-innovation-in-education

interoperable social software tools (ePortfolio, Learning Object Repository and QTI test authoring/delivery tools) and web services (OntoSpace Explorer, SCORM package delivery service). In addition, University of Leuven, TLU's partner in this field, has it's researchers working on projects related to Human-Computer Interaction, including information visualization, computer graphics and text based information retrieval and search. Those mentioned innovation activities will be presented at the seminar.

Conclusion

Information technology and the data it generates has a big impact on all aspects of our lives. The objective for Member States and European Union in general will be to get the technologies and solutions using the data from laboratories to market and provide learners with innovative new solutions in order to make learning more personalized and fun. In the educational domain, employing technology to improve learning processes and outcomes in schools, universities and at the workplace has already been practiced for decades. Now Big Data poses new opportunities and challenges in the educational domain. Europe 2020 strategy flagship initiatives (e.g. Youth on the Move, the Digital Agenda, New Skills and Jobs) depend on the modernisation of education and training systems. The seminar aims to map these challenges in order to discuss the possible solutions that technology has to offer.

The goal of the seminar is to reflect on new trends and perspectives on the use of ICT technologies in schools, higher education and workplaces, and how European Commission and Member States responding to this. The seminar also aims to introduce evidence-based management systems from the Estonian government, plus showcase the experiences of and developed solutions by KU Leuven and Tallinn University in developing ICT-tools for teaching and learning.

Presentation abstracts

Professor Tobias Ley, Centre of Educational Technology, Tallinn University
"Learning Analytics and Sensemaking in highly distributed learning environments - the case of higher education and workplace learning"

With the advent of mobile and social technologies, learning environments used both at the university and at the workplace increasingly become more distributed. This coincides with a stronger focus on informal processes in learning where the acquisition of knowledge and skills is seen as happening across formal and informal learning contexts. This introduces major challenges for the development of tools, for the way learners make sense of these experiences to develop competence, how teachers guide the learning process and and how learning is made traceable across these diverse contexts. If we want to develop skills for the 21st century, new learning paradigms in these highly distributed environments need to be realized. I introduce several technologies from higher education and workplace learning contexts that have resulted from recent EU projects to tackle these challenges.

PhD Grete Arro, Centre of Innovation in Education, Tallinn University
"Designing ICT learning and teaching methods addressing child development in the school context"

ICT has a crucial role in continuously seeking the ways to improve the possibilities to foster learners' cognitive development and in various skills and competencies. Today, the focus is on the learning and teaching with the help of ICT tools; the fundamental need to assess and diagnose before implementing the method should be more emphasized.
Some of the main challenges for the complex educational psychology research are the interdisciplinary intervention studies together with educational technologists and analysts having abilities to design the instruments and tools for both assessment of various cognitive processes, skills, and competencies, and fostering the cognitive development in educational settings. This process should be supported by the newest knowledge from the cognitive development research in school and HE context. As implying the ICT tools and methods in most appropriate and developmental-friendly way, also the teacher education must be connected to the cooperative research and development in developmentally informed ICT instruments used in educational settings.
In Tallinn University, the core focus has been the complex longitudinal educational studies addressing child development in school context, which rely on the current knowledge of cognitive development, social-constructivistic theory and structural-systemic approach; some of the results will be presented at the seminar.