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Leading trends in digital technologies and e-learning: challenges for higher education

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Abstract This paper focuses on the leading trends that digital technologies represented by the Internet and communication technologies (ICT) and e-learning pose for the higher education nowadays. Education, especially higher education, has always been and will likely to remain a leading sphere of human economic and social development, a place whether the future leaders are handpicked, trained and prepared. We discuss the emerging new trends (such as the Internet of Things, Big Data, or mobile learning technologies) and contemplate over the rapidly changing educational space. Moreover, we select and analyse possible threats and opportunities for higher education in the 21st century.
Our results and analysis show that higher education has undergone unprecedented changes and is embracing the advancements in novel technologies. In the same time, the old methods and routines are still important, and it might take some time before they can be completely altered or replaced altogether.

1 Introduction

Digital technologies and e-learning represent an enormous change for the education and the educational process today. Especially higher education is mostly affected embracing the novelties brought about by Internet and communication technologies (ICT). Investing in the latest and most advanced technologies is expensive, and the recurring need for technological progress in the education sector is no different (Sugrue et al. 2018). With technological innovation aimed at improving the education sector for a seamless, more interconnected learning system, the use of cutting-edge technology benefits both students and educators (Pucciarelli and Kaplan 2016).

Many innovations in the learning technologies in higher education are aimed at improving and securing shared data, providing real-time information on student involvement with the course module offered, helping educators optimize their activities and modifying the modules appropriately to achieve better educational results. Lecturers can improve the effectiveness of their teaching process, maintain students and return on investment in their online teaching activities by using datasets carefully to develop behavioural model algorithms.

With the ease of access to the Internet, the popularity of using smartphones and social networking, the education sector must seize the opportunity to provide educational materials in the form of a revelation.

Online classrooms allow students to connect and collaborate in well-known, mobile and social modes that are part of their digital habits outside the classroom. As schools and teachers continue to use more and more technological solutions and software development tools, it is important to take into account new trends in education and student learning.

Digital technologies and e-learning become very important in the process of the internationalization of education and the creation of the educational platforms (Gulicheva and Osipova 2017). They allow to involve

more students and lecturers from multiple destinations or even countries into one single educational process, share knowledge and insights and provide the constant flow of communication and ideas.

There are many new and interesting trends in education processes and technologies nowadays that were made possible using the new Internet-based technologies and e-learning. In this paper, we will focus on some of them and discuss their implications on the institution of higher education of the 21st century. Moreover, we will draw some lessons and implications from the challenges for higher education new technologies might present, including those positive and negative ones.

2 New trends in educational technologies

Nowadays, education, especially higher education needs to develop and implement educational resources that embody the flexibility and power of technology to create fair and accessible educational ecosystems, enabling all students to learn at all times and the academics to conduct their research freely (Potkonjak et al. 2016; Strielkowski 2017). Whether it is creating educational resources internally, using cooperative networks or using traditional procurement procedures, educational institutions should insist on using resources and designing learning experiences using the novel practices to provide accessibility and greater opportunities for learning and research. This might be particularly important for higher educational institutions that are engaged in research and development (R&D). Allowing their post-docs, for example, to work remotely might increase the productivity and improve the results (Strielkowski 2018).

Provide pre - and in - service educators with technologically advanced professional learning experiences to enhance their digital skills and enable them to create compelling educational activities to enhance learning and education, evaluation and education.

Based on the patterns of educational innovation clusters, states, districts, universities and community leaders, they should create coherent communities of practice - both personally and online - to create virtuous cycles to share the latest research and effective practices in the use of educational technologies. While current products and dashboards include basic features and improved functionality for their predecessors, future iterations should be built on a feedback and conversation premise, allowing students and families to discuss learning outcomes and evidence, and increase agency and ownership in stakeholders. In order to further develop the ability of educators to design and deploy valid and reliable formative evaluations, the concerted efforts of current appraisers, teacher preparation programs, school systems and researchers are required.

The educational market interest groups are looking for ways to use technology to develop better educational products. In fact, the premise of intelligent education was made possible thanks to the Internet of things (IoT). The improvements in mobile technology made it possible to use the IoT as a major education technology. Another improvement is Big Data which share in education is growing (Daniel 2015). Some predict that a decade from now Big Data might replace other data collection, processing and analysing techniques (Huda et al. 2018).

Furthermore, industry experts believe that the marriage between education and technology is a positive step towards better involvement of students, resource management, and financial and logistic planning of educational institutions. Garcia et al. (2018) demonstrate how 3D materials can be used in medical education both using the current technology and employing the new trends for the future.

With regard to the above, Jiroudková et al. (2015) highlights the importance of education in the development of transition economies which might be especially relevant for the case of the European Union (EU) that is a pioneer in educational technologies, student exchange programmes (such as Erasmus) but that faces many serious challenges such as Brexit which might hamper its higher educational reforms and cause distortions on its labour market causing the new graduates to fail in acquiring their dreamed jobs (Strielkowski et al. 2016; or Fursov et al. 2018).

New strategies envisaged to enable learning and adapt to the many needs of students have led to a rethinking of the use, design and location of learning spaces. Factors such as food and drink availability, comfortable chairs and furniture that support various educational activities are crucial in the design of learning spaces - proof of the second trend and consider human factors as essential to the design of learning spaces. Constructivist principles of learning, in particular activities that encourage learning, can be translated into design principles that guide tactical decisions, ensuring that the projects we build and the technology we use serve a clear educational purpose.

At present, Learning Management Systems (LMS) are crucial for promoting educational digitisation, while at the same time saving considerable long-term costs, especially in the business environment. While the learning based on both virtual reality (VR) and augmented reality (AR) is a relatively new concept, the first-time students who learn an immersive experience not only attract the most valuable students to their facilities, but also generate positive results from the type of technology that puts the student at the centre of the task or concept. Mobile technologies, especially the widespread use and popularity of smartphones and tablets that are becoming more frequently used than personal computers in personal learning, are also becoming very important and should be used in the educational process (Fu and Hwang 2018).

Technology-based education offers a huge amount of value, providing learners with the content and resources that are most relevant to their needs in the most digestible way possible. The love of game technology for young people makes it an ideal learning tool, allowing students to learn in a safe and virtual environment. Advances in digital technology allow teachers to offer a variety of learning opportunities. More and more teachers are seeing the benefits of enabling students to use digital and social media in their tasks, as they allow students to demonstrate their skills and express their understanding through data visualization and dynamic storytelling (Greenhow and Lewin 2016).

As educational institutions continue to jump on the bandwagon and embrace such trends in digital transformation, we need to look at the current paradigm of technology education and move towards a team - based approach. Augmented, virtual and mixed reality are examples of transformative technology that enhances teacher education and at the same time creates engaging and engaging lessons for students. Educational tools with adaptive order continuously analyse student data in real time and make decisions based on the data.

3 Challenges for the higher education in the 21st century

Challenges for the higher education in the 21st century attract the attention of many authors and researchers. For example, Arum et al. (2016) polemize how the quality of the higher in the United States can be fostered and further improved. Metzgar (2016) discusses China-based university programs for the 21st century that envisages the institutions of higher education as public diplomacy tools.

While higher educational institutions are faced with difficult times, the crisis cannot be interpreted as a reason to abolish the historical obligations to meet the affordability, access and investment of educational improvements needed to meet future educational needs (Kezar and Eckel 2002). From legislators to student financing agencies, the college's voters are studying the cost of education to find the most profitable options. Preparing students to become productive members of today's workforce means that institutions need to move the cord between pre-professional and liberal arts and science, ensuring that students meet the demands of the workforce and learn how to apply their knowledge in practice (Jandová 2012).

New changes in education, in particular higher education, removes many long-established barriers, and new competitive forces such as virtual universities and non-profit educational institutions are emerging to challenge the process of accreditation. The experience with other sectors of the economy, such as health care, transport, communication and energy, can be expected to lead a major restructuring of higher education in the 21st century, with mergers, acquisitions, new competitors and new products and services.

Although universities and colleges teach skills and transmit knowledge, they also preserve and transmit cultural heritage from generation to generation, carry out the research needed to generate new knowledge, act as constructive social critics and provide a wide range of knowledge-based services to society. Nowadays, highly diversified education system will increasingly integrate into a seamless network, with primary and secondary education, Bachelor 's, graduate and vocational training, on-the-job training and continuous education, and lifelong enrichment becoming a continuum. However, such efforts to explore new learning models go far beyond traditional higher education to include a number of new entrants, including publishers, entertainment companies, information service providers, as well as leading IT companies. The pressure on the faculty to achieve success and appreciation has led to major changes in the culture and management of universities (Gaffikin and Perry 2009).

Surely, none of the higher education institutions of the 21st century is going to succeed without major reforms in the way teachers are recruited, selected and not selected to address the overall picture of the human capital of education. Fortunately, there is now potential for graduates to be produced, which measure the ability to think and are also reliable and comparable between students and schools - an integral part of efforts to ensure responsibility and fairness.

Producing enough high-quality graduates to meet the needs of a system as large and varied schools and universities would increase the capacity of the rating industry, and there is no incentive for many newcomers to become large players in this area.

The curriculum, teachers 'experience and evaluation have all been poor in previous efforts to reform education - a fact that should strengthen the skills of today's supporters, while at the same time assessing the task of dramatically improving all three. As higher education professionals recognize data for the raw material IT is, they face a series of complexities that occupy nearly a third of the most important and crucial IT-related issues in the first two decades of the 21st century.

Moreover, higher educational institutions that adopt an effective and sustainable information security strategy based on risk are able to integrate enterprise-wide compliance and unit-wide. For today's students and educators, "student success" can include effective enrolment, timely completion of educational goals, meaningful employment and even preparation for good citizenship.

Another issue is the price of education. Many students cannot longer afford paying their fees. While college affordability remains a crisis, and the "free college" movement in such countries as the United States has pushed affordability to the fore, with falling rates approaching 50 percent in many American four-year institutions and 80

percent in many two-year colleges, there can be no disagreement on the failing interest and the need for reforms (Venezia and Jaeger 2013).

The vocational training can be an example of the approach to the education's current problems, in the absence of sufficient evidence, a candid idealist is needed to continue to insist that a Bachelor's degree is the best or only way to establish the skills of central cognitive and non-cognitive management.

There is no doubt that many for-profit colleges have taken the logic of traditional universities to their logical extreme: enrolling students in programs with a precarious (and often very poor) comeback, using the "addiction" of the Bachelor degree that has been applied for decades for decades. This should be changed, of course, since this approach produces the low-quality graduates who are not capable of orientating themselves in the new world of new and exciting technologies.

4 Pitfalls and prospects of e-learning for the higher education

E-learning technologies focus on providing a comprehensive overview of technological integration with a basic understanding of some key concepts and principles, as well as improving technical skills to enable the production of instructional and professional products through a variety of integrated application programs. There are some integration issues are focused on the legal and ethical practices of e-learning technologies, some personal uses of electronic resources, the need to protect information, the fundamentals of media that allow adapting these technologies to specific populations (Yu et al. 2017).

E-learning technology focuses on the basics of media and technology, integrated technological development and integration with technology in appropriate educational applications for productivity and the application of various research applications in the learning environment (Cho et al 2016). Technical and technical studies are usually online, with some requirements and assignments conducted in the classroom.

The use of e-learning in the educational process teaches students how to combine learning environments, design integrated media, and harness the potential of technology in education (Greenhow et al. 2009). This is, of course, given that the lectures actually know how to apply research-based strategies, use educational practices to promote the equity and access of students, and analyse the impact of technology and globalisation in education.

One of the pitfalls of using e-learning in higher education is that lecturers themselves are not proficient in ICT-based technologies and do not possess an overview of novel tools and solutions. It often happens that the students know a way more than their lecturer and use the Internet and social networks daily. In that case, the learning process can become a disaster from a pedagogical point of view.

In addition, many terms and concepts in e-learning education technology have been poorly defined and studied, for example, the issues of personal learning environment and the acceptance of e-learning by different students. While some individuals seem to be fine with e-leaning, others demand the physical presence of the tutor and the human contact, or eye-to-eye interaction with the lecturer. The emergence of the new technologies, especially things like VR and AR, was so fast that it left the researchers and the educators with no time to simulate their impacts and to understand how they can be best used in the educational process.

However, in spite of all issues, one can see that various virtual training and simulated learning opportunities, such as games or distributed games, provide students the opportunity to connect the content of the classroom with real situations. In the case of computer-based training or computer-based learning, the learning interaction between students and computer-based exercises or real-world simulations. Educational institutions worldwide are attempting to use this new medium by offering distance learning courses through computer networks and mobile technologies.

5 Conclusions, lessons and implications

In general, it becomes apparent that digital technologies including Internet, various ICT applications, e-learning, mobile learning, VR or AR, as well as many other similar innovations are becoming the leading trends for the higher education in the 21st century.

One can see that online courses have grown rapidly and can expand the educational opportunities of many students, especially those less well served by traditional educational institutions. The continuous improvement of online education and education programs can improve the quality of such courses and thus provide opportunities for the neediest people. Online courses are a promise of access, no matter where students live or when they attend, which can redefine educational opportunities for the least well-served in traditional classrooms.

In addition, online platforms offer the promise of artificial intelligence to deliver the optimal pace and content of the course to meet the needs of each student, thus improving the quality of education and learning. AI might become a new interesting development in personalizing higher education teaching processes and tailoring them for each and every student.

There are still many pitfalls associated with the use of new technologies and e-learning in the classrooms, including and associated with grasping and keeping the students' attention, delivering the information, or

preventing them from getting bored. All these provides some interesting lessons that should be learned for those stakeholders and policymakers who have the ambition to steer and shape up the models and standards of higher education in this century.

Our results and findings show that the digital technologies represent a path to follow in the modern educational process of the 21st century. Some lecturers and institutions might be slow in embracing them, but the trend is irreversible.

References

Arum R, Roksa J, Cook A, Improving quality in American higher education: Learning outcomes and assessments for the 21st century, 1st edn. (John Wiley & Sons, 2016), 334 p.

Cho Y, Yoon SP, Kim KS (2016) An industrial technology roadmap for supporting public R&D planning. Technological Forecasting and Social Change 107:1-12. doi:10.1016/j.techfore.2016.03.006

Daniel, B. (2015). Big Data and analytics in higher education: Opportunities and challenges. British Journal of Educational Technology 46(5):904-920. doi:10.1111/bjet.12230

Fu QK, Hwang GJ (2018) Trends in mobile technology-supported collaborative learning: A systematic review of journal publications from 2007 to 2016. Computers & Education 119:129-143. doi:10.1016/j.compedu.2018.01.004

Fursov V, Krivokora E, Strielkowski W (2018) Regional aspects of labor potential assessment in modern Russia. Terra Economicus 4:95-115. doi: 10.23683/2073-6606-2018-16-4-95-115

Gaffikin F, Perry DC (2009) Discourses and strategic visions: The US research university as an institutional manifestation of neoliberalism in a global era. American Educational Research Journal 46(1):115-144. doi:10.3102/0002831208322180

Garcia J, Yang Z, Mongrain R, Leask RL, Lachapelle K (2018) 3D printing materials and their use in medical education: a review of current technology and trends for the future. BMJ Simulation and Technology Enhanced Learning 4(1):27-40. doi:10.1136/bmjstel-2017-000234

Greenhow C, Lewin C (2016) Social media and education: Reconceptualizing the boundaries of formal and informal learning. Learning, media and technology 41(1):6-30. doi:10.1080/17439884.2015.1064954

Greenhow C, Robelia B, Hughes JE (2009) Learning, teaching, and scholarship in a digital age: Web 2.0 and classroom research: What path should we take now? Educational Researcher 38(4):246-259. doi:10.3102/0013189X09336671

Gulicheva E, Osipova M (2017) Program-target method of pricing for international educational services. Czech Journal of Social Sciences, Business and Economics 6(1):21-27. doi: 10.24984/cjssbe.2017.6.1.3

Huda M, Maseleno A, Atmotiyoso P, Siregar M, Ahmad R, Jasmi K, Muhamad N (2018) Big data emerging technology: insights into innovative environment for online learning resources. International Journal of Emerging Technologies in Learning (iJET) 13(1):23-36. doi:10.3991/ijet.v13i01.6990

Jandová P (2012) Migration and economic conditions in the EU: a case study of immigrants in Germany. International Economics Letters 1(1):41-48. doi: 10.24984/iel.2012.1.1.4

Jiroudková A, Rovná LA, Strielkowski W, Šlosarčík I (2015) EU Accession, Transition and Further Integration for the Countries of Central and Eastern Europe. Economics and Sociology 8(2):11-25. doi:10.14254/2071-789X.2015/8-2/1

Kezar A, Eckel PD (2002) The effect of institutional culture on change strategies in higher education: Universal principles or culturally responsive concepts? The Journal of Higher Education 73(4):435-460. doi:10.1080/00221546.2002.11777159

Metzgar ET (2016) Institutions of higher education as public diplomacy tools: China-based university programs for the 21st century. Journal of Studies in International Education 20(3):223-241. doi:10.1177/1028315315604718

Potkonjak V, Gardner M, Callaghan V, Mattila P, Guetl C, Petrović VM, Jovanović K (2016) Virtual laboratories for education in science, technology, and engineering: A review. Computers & Education 95:309-327. doi: 10.1016/j.compedu.2016.02.002

Pucciarelli F, Kaplan A (2016) Competition and strategy in higher education: Managing complexity and uncertainty. Business Horizons 59(3):311-320. doi: 10.1016/j.bushor.2016.01.003

Strielkowski W (2018) A postdoc's purpose. Science 360(6384):27-27. doi: 10.1126/science.aat6008

Strielkowski W (2017) Predatory journals: Beall's List is missed. Nature 544(7651):416. doi: 10.1038/544416b

Strielkowski W, Tumanyan Y, Kalyugina S (2016) Labour Market Inclusion of International Protection Applicants and Beneficiaries. Economics & Sociology 9(2):293-302. doi: 10.14254/2071-789X.2016/9-2/20

Sugrue C, Englund T, Solbrekke TD, Fossland T (2018) Trends in the practices of academic developers: trajectories of higher education? Studies in Higher Education 43(12):2336-2353. doi:10.1080/03075079.2017.1326026

Venezia A, Jaeger L (2013) Transitions from high school to college. The Future of Children 23(1):117-136. doi:10.1353/foc.2013.0004

Yu TK, Lin ML, Liao YK (2017) Understanding factors influencing information communication technology adoption behavior: The moderators of information literacy and digital skills. Computers in Human Behavior 71:196-208. doi:10.1016/j.chb.2017.02.005