

EDUCATION 4.0. “FORCED” TRENDS IN HIGHER EDUCATION INSTITUTIONS IN PANDEMIC TIME

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Abstract: Universities are major players in the future of education. To successfully transition to a knowledge-based economy and a society-based economy, this critical period requires thorough reorganization and modernization of the academic system. Currently, a major part of higher education is based on traditional learning methods and although many academic units have also begun to conduct blended learning, many of them are still subject to the old procedures. Before the pandemic, the most preferred type of online courses was business specific or foreign language courses. Once the Covid crisis occurred, the entire learning environment was “forced” to migrate online, so online learning has changed from the preferred or sometimes available option to the new normal. There are more than 300 million students around the world that have indeed been disrupted in their teaching process due to the spread of the coronavirus. Global higher education institutions are highly impacted by a key component of chaos during challenging times: the ability to adapt and respond to ambiguity and uncertainty in an effective way so that they are not prone to failure.

In this article, I analysed the prospective study of digital challenges in higher education institutions. The importance of the subject being analysed stems from the situation in which all universities find themselves in these difficult times. In addition, the analysis of the subject also revealed several factors other than digital infrastructure, which are very important in online education teaching, namely: adapting to the syllabus and design; tutors/training under “special” conditions the skills of the teacher/professor; inspire participation and compensate for missing human interaction.

Keywords: higher education, digitalization, education trends, academic changes

INTRODUCTION

Higher education is part of a system that is not very quickly adaptable to changes and lacks flexibility, so individual and social demands for higher education remain with a significant number of requests and individuals that seek elsewhere for solutions. Universities are the key players in the future of a knowledge society. For the successful transition to a knowledge and society-based economy, in this crucial times, a thorough restructuring and modernization is required.

Over the last decade, the advancement of new technologies has allowed users to meet their own learning and communication needs both with colleagues and teachers, within their own communities or within external communities, built for educational purposes and using social media tools and services. However, online delivery of high-quality video tutorials or classes was never a must or a priority. The most preferred type of online classes before pandemics were the business specific ones or foreign language classes. Once the Covid crisis stroke, the entire learning environment was “forced” to migrate online, therefore online learning switched from a preferred or sometimes available option to a new normality. More than three hundred million students around the world did encounter

disruptions in their education process caused by the spread of Coronavirus. Educational institutions have not confronted such severe disruption in decades, but unlike any past occurrences, now there is the ability to continue education with the doors closed. Whereas considering that learning by using new information and technology sources has been around for a long period of time, it is remarkable how the impact of technology did not have a substantial influence on education until now. Digitalization in education was meant to happen gradually, but COVID-19 made it an accelerated process with large scale adoption of educational technologies and a boom of online ways of delivering education. All levels of education, from kindergarten to university, have been badly impacted by the new coronavirus, with most institutions either closing entirely or operating at a reduced capacity for many months (Schulten, 2020). Following the initial shock, millions of teachers, professors, and members of educational systems' administrative and technical bodies responded in truly extraordinary ways, attempting to shift the entirety of their teaching activities to the online environment and becoming familiar with the operation of digital platforms such as Zoom, Google Meets, and Microsoft Teams in just a few weeks. Most of them have adapted quite well to the new methods, realizing the tangible benefits they provide and attempting to rapidly overcome inherent difficulties (Tam & El-Azar, 2020).

In this paper I perform an analysis through a prospective study on digital challenges in higher education institutions during the latest pandemics. The importance of the analysed subject is derived from the situation that all universities found themselves in, during these hard times. Also, the analysis of this subject reveals several factors, besides the digital infrastructure, that are very important in the online delivery on education, and namely: adapted course outline and design; tutor/trainer/professors' skills set for delivering the course in "special" conditions; tracking the understanding; motivating the involvement and compensating for the missing human side.

WHAT IS EDUCATION 4.0?

Education 4.0 is a method of learning that is aligned with the fourth industrial revolution and focuses on improving the future of education through new technologies and automation. Education 4.0 is built on creativity. It stresses the importance of preparing students to face and overcome obstacles (Frances, 2019). Participation rate in formal education, especially at the higher levels and the average number of years of schooling, is increasing rapidly throughout Europe. Higher education thus becomes one of the most important sectors of the emergence society / economy of knowledge, asserting itself, through weights and comprehension as a true industry of the time. To keep up with the times, conventional curriculum paradigms must be revisited. The evolution of the education context to Education 4.0 is represented below (Creatrix Campus, 2020).

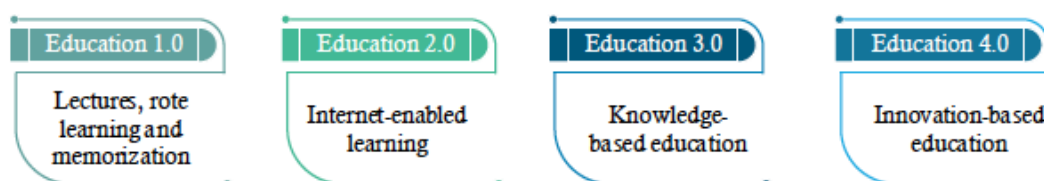


Fig. 1. Education 4.0 – A different learning

Source: Created based on Creatrix Campus <https://www.creatrixcampus.com/blog/Education-4.0>

Aligning the academic environment to Education 4.0

For aligning to the educational requirements, the best way to do that is to balance business demands with educational objectives.

Here are a few options for accomplishing the same goal:

- *Curriculum revision*, with a focus on future-oriented topics. A skill-based learning is the order of the day, thanks to digitization and automation. Employers are in desperate need of trained workers, so they depend on colleges and training institutions to upskill their current employees.
- *Developing digital abilities*. Institutions should concentrate on teaching their faculty to improve digital capabilities to develop completely capable students for their workplace. Soft skills should be made invaluable by a combination of problem-solving and soft skills.
- *Use of immersive learning platforms* for interactive learning. Students and faculty receive remote access for teaching via LMS, and this is becoming more common around the world. Learning and training, as well as course material access, online chat rooms, discussions, collaborations, peer teaching, and mixed learning, all take place during flexible hours.
- *Improve course delivery*. It is important to provide a synchronization between the faculty and the program being taught. Faculty can be receptive to utilizing technical applications to develop their students' cognitive learning abilities. It's crucial for all to understand and adjust to a customized integrated learning strategy to provide a richer, more exciting learning experience for everyone. The inclusion of a strong and inclusive professional structure, along with effective career preparation through several fields, is critical. With the increased focus on schooling and training to foster a workforce for business 4.0, this facet would future-proof Indian education (Mcveigh-Murphy, 2020).
- *Technology-enabled classrooms* are being implemented through universities, schools, and other institutions of higher education to provide good learners for the cyber-physical networks that pervade all industries. This entails developing a technology-rich program and reimagining the learning process to enhance the student experience.

The online education process comes with some difficulties and changes, especially in times where universities were forced to move their activities online in a very short period. Despite the government's planning and preparations and the united efforts of a broad range of stakeholders as society, including schools and families, the implementation of the "online" policy continues to confront at least five obstacles (Wunong, et al., 2020).

1. Infrastructure constrains of online education. Due to the high volume of teaching and staff visits, online teaching platforms are frequently overloaded, resulting in network breakdowns. Meanwhile, regional disparities in information technology

infrastructure might be substantial. In rural places, network coverage is limited, which may exacerbate educational inequalities.

2. The percentage and efficiency with which online educational resources are used are still rather low. Although online courses have previously been held, these served mostly as supplementary to offline instruction. As a result, a sizable number of academic staff had limited experience with or awareness of online resources prior to the epidemic but were forced to replicate offline instructional materials to the network area without making necessary changes.
3. The impact of online education is highly dependent on the competence and expertise of professors to teach online. Since online education was not yet a common method of instruction, many teachers had no prior experience teaching online. Although instructors received a variety of sorts of training during the epidemic, the impact of such training is perhaps negligible in the near run. Additionally, the gap between urban and rural areas, instructors' varying degrees of knowledge about information technology, and instructors' varying attitudes toward and aptitude to learn information technology all influence the overall success of online education (Zhang, et al., 2015).
4. Students and teachers have difficulties when they study and teach from home. To begin, there are several distractions associated with teaching and learning at home. For instance, the stress of housework and childcare might be substantial for young instructors, which might have a detrimental effect on their online teaching. Second, not all teachers and students have adequate room at home for teaching and studying. Thirdly, teaching and learning may be hampered at home by insufficient hardware and an inconsistent network (Illeris, 2014).
5. It is unknown whether instructional style and technique will work best for online education. Therefore, the incorporation of the unique characteristics of online education into daily online teaching and learning requires more investigation.

DELIVERING THROUGH ICT IN HIGHER EDUCATION

It is not very easy to develop an eLearning material that delivers the content and instructional methods, that will be attractive, encourage participation and engagement, and incorporate activities that support various learning styles of the participants. More than that, which comprises elements of both synchronous and asynchronous learning in a way that would maximize students' engagement and at the same time keep the core course objective and goals (Jarvis, 2012). The use of information and communication technologies (ICT) in higher education (HE) and the resources of the internet have enriched universities' teaching and learning. It has also put universities to maximize the benefits of technological adoption, to align to students' aspirations, cultural diversity, and student mobility. Understanding how students learn and designing curriculum and learning that are student-centred are critical factors for the effective application of ICT and related technology in teaching and learning.

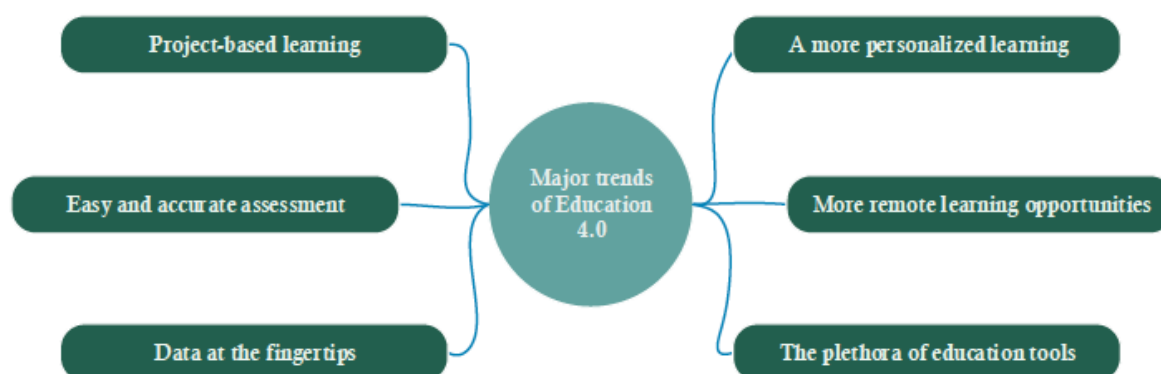


Fig. 2. Major trends in Education 4.0

Source: Created based on Creatrix Campus <https://www.creatrixcampus.com/blog/Education-4.0>

A summarization of the above-described trends affecting Education 4.0 are presented in the sections below.

- A more personalized (tailored) educational experience

Education 4.0 values each student's uniqueness and their ability to study at their own speed and pace. Having a more individualized approach to teaching will have a bigger influence on students' ability to effortlessly attain their objectives. With the advancement of Artificial Intelligence and Cloud Computing, multiple technologies are available to tailor the entire teaching process to the learner's needs and learning pace. On the other side, faculty will be able to quickly identify students' strengths and problems and give immediate feedback (Wunong, et al., 2020).

- More remote learning opportunities

Education 4.0's central tenet is to make learning accessible to everyone, anywhere, at any time through a suite of e-learning technologies that facilitate remote and self-paced learning. The notion of Active Blended Learning (ABL) is gaining traction, in which students are actively participating in learning outside of the classroom. As a result, individuals have a command of both practical and experience learning.

- The abundance of educational tools

By integrating tools and strategies into their learning environment, Education 4.0 demonstrates a clear path to students. This implies that students will have the freedom to select the tools and strategies they choose to use to gain information. Several examples include collaborative and engagement tools, flipped learning, and blended learning (Tam & El-Azar, 2020).

- Project-based learning

The project-based approach that Education 4.0 promotes encourages students to study in a fun and engaging manner. It foregoes theoretical knowledge and encourages students to develop time management skills, organizational skills, collaboration skills, and time management abilities, all of which are critical for their future work.

- Easy and accurate evaluation

With Education 4.0, a more realistic approach to evaluation is used. Assessments are conducted both online and offline, and students are graded on projects, assignments, and fieldwork.

- Data at the fingertips (access to data)

Education 4.0 provides deeper insights into students' learning journeys through data analytics and reporting. The statistical analysis enables teaching professionals to ascertain the precise position of pupils and to advise them properly.

Lederman (2020) noted that because of the COVID-19 crisis, both academic staff and students feel forced to accept the new academic experience of online teaching-learning process.

The current tendencies regarding higher education in the European stage are:

1. Continuous increase in the demand for access to higher education - it is a globally registered phenomenon.
2. Globalization - represents a real challenge for the higher education institutions, the pressure of competitiveness being felt on all the structural levels. At the same time, the directions imposed by the norms of the European Union involve huge efforts and investments to be able to develop the institutional and human capital.
3. Development of technology and information - brings with it the emergence of building new structures - at organizational, managerial level but also for the use of new technologies in the teaching process.
4. Financing of higher education - as a general trend observed in higher education institutions around the world, we can say that there is an attempt to redefine the balance regarding financial resources allocated by the state in relation to those obtained from private resources.

Higher education institutions have a specific formed way for organizing their study programs, the way the teaching process is carried out or the way the educational content is delivered. The past and the present shape the future, therefore there is not a single method, a single rate of change, that can be applied to all cases. The mission of the universities is now affected by the competitors (the majority being represented by non-profit educational organizations). The change in the way of doing education is determined not only by a dialectic intrinsic to this activity but also by the obvious challenges exercised from outside (through the technological, economic, scientific changes) (Lederman, 2020).

There has always been a vicious circle of society - education, a circle that can be extended to society - university. Considering these connections, we find that this vicious circle is subjected to a double pressure, at national but also European level (referring to the objectives imposed by European Union norms), pressure that is exerted both quantitatively and qualitatively (aiming at correspondence) between the university environment and the insertion on the labour market of graduates.

According to Illeris (2014), there were four different approaches to the traditional learning system:

- Behavioural perspective: what focuses on analysing the behavioural changes in the stimulus-response relationship, focusing on the ability to adapt the responses
- Cognitive perspective: in which the learning process relies on communication, explanation, recombination deduction and problem solving. It focuses on designing sequences based on already existing information.
- Constructivist perspective: what analyses the processes through which the learner realizes his own mental structures in interaction with the environment; focusing mainly on practical activities, for modelling and discovery.
- The perspective of social learning regarding the psychological interactions from the social perspective. It focuses on observation as a source of learning within human relationships.

CONCLUSION

Over the last decade, the advancement of new technologies has allowed users to meet their own learning and communication needs both with students and academic staff, within their own communities or within external communities built for educational purposes and using social media tools and services.

The 21st century student is the one who learns on demand, which is why the on-demand knowledge model is a new and flexible way to offer a new type of education that requires higher education providers an adaptive thinking to survive the change. New educational sources that are characterized by their flexibility will be an integral part of the educational landscape 4.0 of the future. There will always be a place for curious intellectual students to gather to be introduced by an informed teacher. Those who want this experience will always be available the path to a traditional university. Still, universities must respond to the increasing number of students whose situation makes physical participation in courses difficult or impossible. Online delivery of high-quality education will ultimately become a must.

Unlike the traditional methods by which the information transmitted in the courses were delimited, carefully selected, and well controlled, the new methods also entail the disadvantage of losing control over the content and information security. Although universities are facing this wave of technological development, we cannot ignore the fact that there are regions, both in Romania and worldwide, where the infrastructure does not allow this leap. Moreover, given such a wide range of applications, a few questions arise regarding the criteria for selecting the best applications that can be implemented within the formal framework.

Perhaps for the first time in the history of higher education, the COVID-19 epidemic has elevated distant education to the status of the new standard teaching technique for nearly a complete academic year. As previously said, both the quality of the courses and the level of instruction were not always comparable to that of traditional in-person education, at least not for all students, but the overall results are rather amazing. While the suggestions for a significant number of distance learning courses clearly provide a chance for a "new normal" following the COVID-19 epidemic, they also provide a few obstacles.

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