# HIGHER EDUCATION IN THE ERA OF DIGITALIZATION

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## INTRODUCTION

At present, the world has moved into the era of the fourth industrial revolution, Industry 4.0, which imposes special conditions on the implementation of most types of activities. First of all, the industry and the economic sector as a whole are subject to modification, however, the transformation of these areas is impossible without the training of qualified personnel. Focusing on global digitalization, there is a need for wider training of specialists both in the subject area and in the field of self-organization and self-learning ability. It's no secret that in the realities of the 21st century, the key resources are up-to-date, reliable information, including the ability to search for it, analyze it and correctly transcribe it, and knowledge. Competent perception and processing of the received information allows organizing the learning process more efficiently and productively.

The complication of social structures and relations, which are increasingly based on modern digital technologies, highlights the need to form a new type of economy, the main tool of which is digital technologies. It is this type of economy that is commonly referred to in modern literature by such concepts as "digital economy" and "digitalization".

## LITERATURE REVIEW

Many foreign scientists were engaged in the study of these concepts, including D. Bell, F. Weber and D. Bode, Machlup, A. Riis, A. Tofler, X. Khanamari and D. Wada, K. Arrow. For the first time in the world, the concept of "digitalization" was introduced by Canadian scientist Don Tapscott in his book "Electronic-Digital Society: Pros and Cons of the Age of Network Intelligence" in 1995. [3, c.102]

Today, the term "digitalization" makes sense to consider in a narrow and broad sense. Digitization in the narrow sense refers to the transformation of information into digital form, which involves cost reduction, the emergence of new opportunities. Digitization in a broad sense is understood as a modern global trend in the development of the economy and society, which is based on the transformation of information into digital form, which should lead to an increase in the efficiency of the economy and an improvement in the quality of life.

The beginning of 2020 again forced the whole world to turn to the issue of digitalization of education. This interest is associated with significant scientific and technological progress in the digital field, as well as with the emergence of the coronavirus infection "COVID-19", which was quickly recognized as a pandemic. Currently, the education of the future is undergoing a digital transformation, going beyond the time frames of life, beyond educational institutions using the unique capabilities of network and digital technologies, with the involvement of all direct and indirect participants in the educational process. The role of the teacher is changing in the era of the digital economy, new forms of interaction between the teacher and the student, the so-called network interaction, are emerging. [4, c.135]

Today, in the conditions of Uzbekistan, the study on a scientific basis of the laws, trends and opportunities for the development of the digital economy, in particular the degree of penetration of modern information technologies into various sectors of the economy, is of particular relevance. The success of large-scale reforms carried out in the country directly depends on the introduction of new innovations in the national economy. Therefore, the improvement of the digital economy and the scientific study of its social, economic, political and legal foundations play an important role. According to the network activity index (Networked Readiness Index - a complex indicator characterizing the level of development of information and communication technologies in the countries of the world), proposed by the World

Economic Forum to assess the readiness of countries for the digital economy, Uzbekistan occupies 83rd position among 121 states in this rating. However, according to experts, Uzbekistan has the potential to increase the speed of digitalization.

In his Address to the Oliy Majlis, the President of the Republic of Uzbekistan Shavkat Mirziyoyev identified the widespread introduction of digital technologies in all spheres of the country's socio-economic life as a priority. [1, c.3] Thus, the State Program, adopted within the framework of the Year of Development of Science, Education and the Digital Economy, provided for the development of the strategy "Digital Uzbekistan - 2030".

Today, the digital economy provides up to 15.5 percent of the world's gross domestic product. Over the past 15 years, the digital economy has been growing 2.5 times faster than global GDP. It is planned to double the gross domestic product in our country. The starting step towards the formation, implementation and development of digitalization as a new innovative component of the economy was the adoption of a resolution by the President of the Republic of Uzbekistan Sh.M. Mirziyoyev dated July 3, 2018 No. PP-3832 "On measures to develop the digital economy in the Republic of Uzbekistan". In fact, this document is a comprehensive strategy for the development of information technologies in the country for the next decade. [2, c.36]

The next decade should become an era of change in higher education, the reform of the digitalization of education involves equipping educational institutions with modern technology, namely computers with the ability to connect to the Internet, information systems that allow access to educational resources, the results of modern scientific research and development, electronic scientific libraries in various languages of the world.

## RESULTS AND DISCUSSION

Digitalization makes it possible for the rapid and high-quality development of educational, scientific content related to innovative technologies.

This is, first of all, the creation of digital electronic textbooks, manuals and other educational literature, as well as the transfer of the entire monitoring educational system to digital format.

Secondly, the digitalization of online learning will give significant and expected results to both subjects and objects of the learning process. There is full confidence that the personnel trained on the basis of digital technologies will become professional pilots of our economy in the competitive environment of the global market.

Digitalization of education leads to serious changes in the labor market and is focused on the reorganization of the educational process, rethinking the role of the teacher. On the one hand, digitalization undermines the methodological basis of the school inherited from the past, which has proven its effectiveness, but on the other hand, it creates the availability of information in its various forms. However, the availability of information will require teachers and students to constantly search for and select relevant and interesting content, as well as high-speed processing of the information received. And if children quickly adapt to the digital environment, forming the initial skills and abilities to use digital technologies, then this cannot be said about people of older generations.

Below are six opportunities to accelerate transformation at your educational institution.



*Internet of Things*

In the field of education, interactive boards and digital highlighters are among the popular devices related to IoT. The boards help in accelerating and simplifying the learning experience as they receive, acknowledge and reciprocate information in an easier manner. At the same time, digital scanners help in the digitally transferring text to smartphones, hence facilitating the learning experience. It becomes easier for students to interact with educators and

instructors sitting across the world. With the help of Internet of things, educational institutions can promote a collaborative environment, as students while working in groups can transmit their data to a collaborative work area by just scanning a QR code or RFID tag by using their smartphones. IoT applications are also used to integrate mobile learning applications and there has been an increase in use for evaluating and grading systems.

*Virtual Reality*

There has been a challenge to provide experiential learning as it is cost intensive and virtual reality is changing that. VR transforms learning through interactive and dynamic experiences enabling educators and students to engage with each other through a huge spectrum of interactive resources. In higher education, VR has found some interesting applications. Virtual and augmented reality are examples of transformative technology which is helpful in enhancing instruction and also creating lessons that are engaging and fun for the students. For example, an app like Cospecies helps students to share the virtual creations done by them with the world.

*Predictive Analytics.*

Students have the tendency of dropping out of university programmers at various stages because of certain reasons. The reason could be socio-economic, long distances, selection of the wrong course and also difficulty in managing curriculum schedules etc. Though each of the problems can be solved, predicting and identifying students who are most likely to drop off is difficult. This challenge of retention can be done by analyzing student data and using it to predict who among the students are the most likely to drop out of the courses. Before the student plans to drop out, interventions, when applied at the right time, can help the student to continue by providing the correct solution. Big data and predictive analytics in higher education institutions can help students make better decisions. Consolidating the complete demographic, academic and social data can be basically used to create better interventions so that the student is put back on the track. An easy example of this is providing a student with low grades in science, a reminder about tutoring or coaching. A little more complex variation will be studying a particular student's eating habits while his visit to the cafeteria from four days a week to once a week can probably mean an intervention is required. An easy access to key data allows faculty and instructors to intervene in a faster mode.

*Adaptive Learning*

For many years from now, the traditional, one-size fits all teaching methodology has dominated education and moving away from all this is adaptive learning. Adaptive learning is dependent on Data sciences, Artificial intelligence, Machine learning and creates a scalable personalized content, mimicking one-on-one learning. This finally helps students to be a master of a topic before they move to the next topic. For example, in HarvardX, an adaptive learning program providing online courses from Harvard University, the students who were in the adaptive group were much faster through the course materials as compared to the controlled group. It was also found that they gained a 19% greater knowledge.

*Artificial Intelligence*

Enabled Digital Assistants As it is not always possible for instructors to be around all the time to answer the queries students have, AI enabled digital and conversational assistants can be of great help. As they are based on domain-specific applications, basically built on speech technology like National Language Processing and AI, they can help answer the queries raised by students. They can be utilized as the instructor's assistant when they are trained properly to and analyze and provide grades and feedback to students and also virtual training. There are also students from different parts of the world who are using technologies like Siri, Cortana, Alexa to manage lives with the expectations that these technologies can help them with their education also.

*Digital Dashboards*

With the help of dashboard technology, extracting learner data becomes easier. Instead of spending time on marking papers or gauging responses in the classroom, a single click on the mouse can provide accurate data and report key performance indicators. It not only delivers organization-wide visibility of a student's achievement but can even provide minute details. As and when an issue occurs it gets highlighted and instructors or teachers can review teaching areas and look at the performance to identify different trends and track learners. This helps in providing continuous feedback from students, instructors and in turn improvises teaching and learning outcomes.

Thus, summarizing all of the above, we can conclude: Digital competence is the main requirement for the training of highly qualified personnel in higher education institutions. This is the cornerstone of the digitalization of the economy. It is no secret that the problem of lack of qualified personnel in the field of digitalization is quite acute. It is necessary that the "Digital School" system and, as its subsequent stage, the "Digital Higher School" system work. After all, it is at these two stages of education that the entire digital infrastructure of society and, in particular, the economy is built.

Summing up and evaluating the prospects for the development of education in terms of the transition to a digital environment, it can be noted that the process, although it is at the initial stages, is already characterized by significant changes in approaches to the methods and formats of education. Further steps will allow for even greater integration of education into everyday life in all areas and for all levels of initial training.

But then, educators who come from different grade-level are realizing the benefits of technology in the classroom and beyond it. Education is still one of the last industries to undergo and adapt extensive change – still running with antiquated methods and practices. But there are many educational institutions around the world who understand the advantages of digital transformation and the rise of educational technology. Instructors and teachers

have started to make major changes to their regular instructional and assessment methods and that too at a faster speed rate.

The current trends in digital technology in education are making headlines as they are in a huge way impacting student learning from virtual personal assistants for students to embedded CRM, digital transformation helps educational institutes to serve better. Today technology is very much changing the landscape of higher education. Educators are today implementing technology in classrooms, from massive open online courses (MOOCs) to flipped classrooms the new methods and ways are there to enhance the student learning experience.

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