TÜRKİYƏ VƏ QAZAXISTANDA UNİVERSİTETLƏRİN RƏQƏMSAL TRANSFORMASİYASI: MÜQAYİSƏLİ TƏHLİL

ƏBÜLFƏZ SÜLEYMANLI, Professor, Dr., Türk Akademiyası, Astana, Qazaxıstan / Sosiologiya kafedrası, Üsküdar Universiteti, İstanbul, Türkiyə.
E-mail: ebulfez.suleymanli@uskudar.edu.tr
https://orcid.org/0000-0003-1894-5232

NURLAN BAYQABİLOV, Dosent, Dr., Sosiologiya kafedrası, L.N.Qumilyov adına Avrasiya Milli Universiteti, Astana, Qazaxıstan.
E-mail: baigabylov_no@enu.kz
https://orcid.org/0000-0001-8212-9171

OLQA ŞEBALİNA, Doktorant, Sosiologiya kafedrası, L.N.Qumilyov adına Avrasiya Milli Universiteti, Astana, Qazaxıstan.
E-mail: sch.olga_enu@mail.ru
https://orcid.org/0000-0001-7641-2528

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ANNOTASİYA

Məqalədə Türkiyə və Qazaxıstanda universitetlərin rəqəmsal transformasiya prosesləri təhlil olunur. Müəlliflər dövlət səviyyəsində ali təhsilin rəqəmsallaşdırılmasının müqayisəli təhlilinin nəticələrini təqdim edir; ali təhsilin rəqəmsallaşdırılmasının ən mühüm mərhələləri nəzərə alınır; bu sistemlərin qurulması və fəaliyyət prinsipləri, həmçinin onların ümumi və fərqli xüsusiyyətləri təqdim olunur; hər iki ölkədə ali təhsilin rəqəmsallaşdırılması ilə bağlı mövcud problemlər göstərilir. Müqayisəli təhlil müəllimlərin rəqəmsal savadlılığı, ali təhsilin rəqəmsallaşdırılmasının təşkilati prosesi, tələbələr arasında rəqəmsal savadlılıq kimi meyarlar əsasında aparılıb. Eyni zamanda, dövlət səviyyəsində ali təhsil sistemində rəqəmsal texnologiyalardan istifadənin mövcud vəziyyətinin qrafik şərhi təqdim olunub.
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Açar sözlər: Rəqəmsal transformasiya, ali təhsil, rəqəmsal savadlılıq, Türkiyədə ali təhsil, Qazaxıstanda ali təhsil.

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DIGITAL TRANSFORMATION OF UNIVERSITIES IN TÜRKİYE AND KAZAKHSTAN: COMPARATIVE ANALYSIS

EBULFEZ SULEYMANLI, Professor, Dr., Turkic Academy, Astana, Kazakhstan / Department of Sociology, Uskudar University, Istanbul, Türkiye.
E-mail: ebulfez.suleymanli@uskudar.edu.tr
https://orcid.org/0000-0003-1894-5232

NURLAN BAIGABYLOV, Associate Professor Dr., Department of Sociology, L.N. Gumilyov Eurasian National University, Astana, Kazakhstan.
E-mail: baigabylov_no@enu.kz
https://orcid.org/0000-0001-8212-9171

OLGA SHEBALINA, PhD student, Department of Sociology, L.N. Gumilyov Eurasian National University, Astana, Kazakhstan.
E-mail: sch.olga_enu@mail.ru
https://orcid.org/0000-0001-7641-2528

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ABSTRACT

The article focuses on the study of the digital transformation processes of universities in Türkiye and Kazakhstan. The authors presented the results of a comparative analysis of the digitalization of higher education at a country level; the main stages of digitalization of higher education are considered; the principles of construction and operation of these systems, as well as their common and different features are outlined; current problems of digitalization of higher education in two countries are highlighted. A comparative analysis was carried out based on such criteria as the digital literacy of teachers, the organizational process of digitalization of higher education, and digital literacy among students. A graphical interpretation of the current state of the use of digital technologies in the higher education system at a country level is presented.
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Keywords: Digital transformation, higher education, digital literacy, higher education in Türkiye, higher education in Kazakhstan.

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INTRODUCTION

Modern society is moving from an industrial status to an information one, in which information and knowledge become the key resource. A qualitative transformation of society inevitably leads to the same change in education. It is the educational system that is capable of solving the main problems of society in the 21st century.

As part of the discussion about the concept implementation of the digitalization in the Bologna process, F. Rampelt and others argue that the full potential of digitalization has not been realized at the system level, which is primarily due to the fact that "digitalization is seen as an additional task, and not as a means of solving the existing tasks of higher education" Rampelt et al., 2019). In 2018 Paris Communiqué calls on universities to support students and teachers to be creative in the digital environment (European Higher Education Area and Bologna Process, 2018). This initiative is aimed at improving the quality and efficiency of the implementation of the blended learning throughout life, developing digital skills and competencies, improving the mechanism for data analysis and research in education, and eliminating regulatory obstacles to provide open and digital education (Digital Education Action Plan, 2021). Students and staff must be equipped with environmental and digital skills for the future, and the innovation and technological capabilities of universities must be used to deal with related social challenges. At the same time, it is expected that by 2030, 20 million specialists will be employed in the information and communication technologies industry (Higher Education European strategy for universities communication, 2022).

The digital transformation of the higher education system is focused on the comprehensive implementation of the advanced digital technologies in all business processes of universities, contributing to their transformation at various levels (Shahi & Sinha, 2021). The digital transformation of the university is closely related to the provision of multi-channel communication technologies, virtual reality, and educational tools aimed at developing the professional competencies of young people within the framework of Industry 4.0 (Scholkmann, 2021).

At the same time, the university not only ensures their implementation and involvement of students, but also records educational achievements and the degree of student satisfaction (Orellana et al., 2019; Balyer & Öz, 2018).

This process is primarily driven by factors such as the need to generate and transfer scientific, technological knowledge and professional skills (Gylfason, 2001), the need to develop new learning models, and affects both organizational and cultural changes (Díaz-García et al., 2022).

Changes in organizational procedures for teaching and learning, methods of communication with stakeholders inside and outside the university, determine the inclusion of the social factor in the processes of digital transformation. In the educational environment, tools based on digital technologies, as well as new pedagogical approaches and teaching methods, are becoming widespread, and the flexibility of individual educational paths is increasing in accordance with the needs of students. Special attention should be paid to issues of data protection and information security. Thus, affecting all levels of functioning of a higher education organization, issues of digital transformation require consideration from technological, organizational and social points of view (Alenezi, 2023).

In world practice, in the process of digitalization of higher education can be implemented in various tools. For example, A. Haleem et al. in their study identify 34 areas of application of digital technologies in education, including increasing teaching productivity through automation of planning, assessment, and use of learning resources; creation of virtual classes; development of digital libraries; support for inclusive learning; development of team work skills; ensuring flexibility of learning and developing self-regulation skills of students; blurring boundaries, as well as the transition to a

hybrid teaching and learning model (Haleem et al., 2022).

The aim of this study is to conduct a comparative analysis of the digitalization of higher education in Türkiye and Kazakhstan; identifying the principles of construction and operation of these systems, as well as their common and different features.

Thus, a thorough analysis of systemic changes taking place in the higher education system at a country level will contribute to a deeper understanding of the situation, making effective decisions, as well as applying the best global practices.

METHODOLOGY AND RESEARCH METHODS

We used the following research methods such as analysis (an analysis of the digitalization of higher education in Türkiye and Kazakhstan was carried out, a certain set of characteristic features was identified), an analogy method (the fundamental features of the digitalization of higher education were identified), a comparison method (a direct comparison was made of the digitalization of higher education according to the main indicators: digitalization of the educational process, requirements for teachers and requirements for students), generalization method (general directions of development and current trends in the field of digitalization of higher education were identified), historical method (the stages of formation of digitalization systems of higher education in these countries were considered).

A comparative analysis of the digitalization of higher education in Türkiye and Kazakhstan was carried out based on the following criteria: digital literacy of teachers (preparation of online lessons, online lectures, online tests), organizational process of digitalization of higher education (principles of constructing a digital educational process), digital literacy among students.

A comparison of the digitalization practices of the higher education in Kazakhstan and Türkiye is based on an analysis of regulatory documents, expert reports and scientific publications. The analysis covers the period from 1997 till 2023. Based on the analysis, the following factors of digital transformation in higher education were identified.

1. Social profile

Today, education, knowledge and skills of a person can improve the quality and standard of his life. It has become one of the most important factors determining a person's life today – the opportunity to develop professional and personal qualities, regardless of time and location, in order to provide high-quality and affordable remuneration, which is necessary for democratic societies (Duderstadt, 2001). Of course, the largest share of this responsibility falls to higher education. With the spread of lifelong learning, a new education system has begun to emerge to address the masses to meet the changing educational needs of society through technology. In this new understanding of education, the concepts of time and space characteristic of traditional education no longer exist. As Duderstadt argues, with the help of synchronous and asynchronous learning tools and interfaces, education is now possible "anywhere," "anytime," and "with anyone." (Duderstadt, 1998)

Modern information technologies have freed the higher education system from the limitations of time and space.

2. Changing the portrait of students

One of the most important factors that make digital transformation in higher education almost mandatory is a change in the portrait of students. The digital educational environment contributes to the formation of values for self-development and self-education among students. Many researchers in the literature note that technology is the biggest factor of change in higher education and universities, technology is the biggest factor of change in higher education and universities, as a result of the influence of technology on students and their learning paths,

argue that they face the greatest challenges of the current period (Brown & Adler, 2008)

3. Transformation of the teacher's role

In modern conditions, the role of a teacher in educational institutions has seriously transformed. It has ceased to be the only source of information and is no longer a monopolist in the possession of knowledge; it enters into "competition" with new technologies and the Internet.

The digital environment requires a different mentality and a different perception of the world from the teacher. The teacher becomes not only a knowledge carrier that he shares with students, but also a guide and designer of student experiences, processes and learning environments. (Duderstadt, 2001). Undoubtedly, the teacher must have digital literacy, the ability to create and apply content through digital technologies, including computer programming, search, information exchange, and communication skills.

A teacher can play a determining role in the professional development of a student's personality. The project approach in managing the student development process is of particular importance in teaching activities. (Dodd, 2015).

4. Teaching methods

In the digital era, due to the widespread introduction of ICT in education, there is a transition to a new educational paradigm. The transition to a new learning paradigm leads to a correction of the pedagogical and general methodological paradigms, and a change in the social paradigm inevitably entails radical reforms in the field of specialized knowledge, always accompanied by a change in the content of education, principles, methods and organizational forms of education. With this transition, first of all, the projective principle takes on the main role, the understanding of education as the acquisition of ready-made knowledge is abandoned, and the role of the teacher changes (Barr & Tagg, 1995). The possibilities of the network space make it possible to activate the independence of students, contribute to the individualization of the educational process, the transition from training to self-learning and self-education. In other words, the digital age is shifting from teacher-centered classrooms to student-centered classrooms.

5. Impact of the coronavirus pandemic

The digitalization of education has become especially noticeable after the outbreak of the COVID-19 coronavirus pandemic in 2020. The pandemic that has swept the entire planet has forced significant adjustments to be made in the organization of education for schoolchildren, college students, and students of higher educational institutions. The impact of the pandemic has affected nearly 1.6 billion students in more than 190 countries. Educational closures affected 94% of the global student population, compared with 99% in low-income countries. UNESCO estimates that in 2021, 23.8 million students (including university students) may drop out of school and lose access to education. At the same time, students will suffer the most due to problems with paying tuition (COVID-19 education response..., 2020). Schools and universities were forced to move to distance learning online, and this affected everyone – schoolchildren and their parents, teachers, students and university teachers. First of all, the role of distance education has increased significantly, which in a particular situation has become the only option that allows not to interrupt the educational process.

6. University 4.0

One of the frequently encountered concepts in the digitalization of higher education is University 4.0. University 4.0 is a new university structure (Dewar, 2017). Within this framework, there are different types of services such as traditional, mixed/multiple or online.

The University 4.0's own key technologies are cognitive technologies, and both of their emerging branches are: 1) enhancing human intelligence through computer technologies, creating hybrid intelligences, 2) technologies

for the formation and support of collective intelligence. The "material body" of University 4.0 includes, in addition to classrooms, libraries, laboratories, business incubators and technology parks, public centers, also communications and telecommunications infrastructure (Lapteva & Efimov, 2016).

DIGITALIZATION OF HIGHER EDUCATION IN KAZAKHSTAN

The Kazakhstani practice of regulatory regulation of the sphere of higher and postgraduate education reflects the issues of informatization, digitalization and digital transformation in the context of training specialists, as well as the promotion of scientific research.

Turkish universities, like most universities in other countries, have been actively involved in the digital transformation process. The specificity of the last decade is that universities are the most active subjects of digitalization of the educational system.

Informatization of education in Kazakhstan began with school education; the State Program for Informatization of the Secondary Education System, adopted in 1997, provided for the computerization of secondary and primary schools; development of an education management information system, development of information culture and teaching the basics of computer literacy in schools (State Program of the President of the Republic of Kazakhstan for informatization of the secondary education system of the Republic of Kazakhstan, 2009). However, already in the period from 2002-2004, a decision was made to create a unified educational information environment in the Republic of Kazakhstan and integrate the information system into the global educational space. Developments in the field of organizing distance education are beginning, and domestic electronic textbooks are appearing (The Concept of informatization of the education system of the Republic of Kazakhstan, 2001).

At the next stage, within the framework of the State Program for the Development of Education in Kazakhstan for 2005-2010, total computerization, expanded use of ICT in the educational process and the introduction of electronic textbooks were envisaged (the State Program for the Development of Education in the Republic of Kazakhstan for 2005-2010). As one of the main directions of the State Program for the Development of Education in Kazakhstan for 2011-2020, it was planned to develop e-learning and ensure equal access for all participants in the educational process to the best educational resources and technologies (Sapargaliyev & Shulenbayeva, 2013; State Program for the Development of Education of the Republic of Kazakhstan for 2011-2020).

Currently, the Law of the Republic of Kazakhstan "On Education" includes registers of educational programs at all levels, educational monitoring data, and administrative data relating to the activities of organizations at all levels of education in the objects of informatization in the field of education that provide "the possibility of effective management." At the same time, special attention is paid to the security of personal data contained in informatization objects ("On Education" Law of the Republic of Kazakhstan, 2007).

In the state program "Digital Kazakhstan", digitalization was considered as the key to creating a new society where human capital is actively developing; digitalization of industrial sectors is envisaged; development of digital infrastructure, ICT industry and digital skills of youth. The program declared the need to update the content of "all levels of education through the development of digital skills of all specialists" (the State Program "Digital Kazakhstan", 2017).

The objectives of the State Program for the Development of Education and Science of the Republic of Kazakhstan for 2020-2025 included equipping educational organizations with digital infrastructure and modern material and technical base, as well as modernization and digitization of scientific infrastructure. In this regard, it was planned to develop the IT infrastructure, develop digital educational resources, Massive Open Online Courses (MOOCs), as well as provide

services to educational organizations in a digital format. In addition, it was planned to form a digital ecosystem of higher education, based on the transition "to digital and intelligent management services" (State Program for the Development of Education and Science of the Republic of Kazakhstan for 2020-2025).

The Concept for the Development of Higher Education and Science in the Republic of Kazakhstan for 2023–2029, adopted on March 28, 2023, is also aimed at further developing the digital infrastructure of universities. In accordance with the best world practices, domestic universities should make the transition to the model of "smart universities" with a digital ecosystem. Priority areas are the introduction of virtual universities, personalization of learning, transition to blended learning, gamification and interactive learning process. The university's digital ecosystem provides for the creation of a student's digital profile, reflecting the educational trajectory and academic achievements. The digital architecture of a university, according to the developed concept, includes not only infrastructure, but also digital tools to support educational and training activities, university administration, and interaction between subjects of the educational process. The creation of digital campuses based on online platforms providing educational resources, digital transformation of libraries, and the use of open education platforms are planned (the Concept for the development of higher education and science in the Republic of Kazakhstan for 2023-2029).

The Roadmap for the Digital Transformation of the Science and Higher Education Industry provides for activities in three strategic areas:

1. Higher and postgraduate education, including reengineering of business processes in the areas of supporting activities, ensuring accessibility of education, managing curricula and plans, attracting applicants and enrolling in a university, organizing and evaluating the educational process.

2. Science, including reengineering of business processes in the areas of planning and conducting research, applying the results obtained.

3. Language policy, including the tasks of reengineering business processes in the field of development, study, assessment of knowledge and use of languages (Order of the Minister of Science and Higher Education of the Republic of Kazakhstan).

One of the main priorities of the National Development Plan of Kazakhstan until 2025 (On amendments to Decree of the President of the Republic of Kazakhstan, 2018) is "quality education," which also emphasizes the digitalization of this industry. The essence of the priority is the development of human capital to implement a new course of development for the country. In terms of digitalization of higher education, the following main directions, which are indirectly reflected, include:

— from gaps in the quality of education associated with place of residence and social status to equalization of access to quality education;

— from a shortage of high-quality educational infrastructure to a full provision of facilities that meet modern sanitary, safety, and equipment standards;

— from insufficient connection between science and production to the introduction of progressive technological solutions of domestic science into the production and industrial sector with access to the global scientific space;

— from a shortage of high-quality scientific infrastructure to a full provision of facilities equipped with equipment that meets the best world standards.

In the context of education and digitalization, the "Kazakhstan-2050" strategy and the Strategic Development Plan of the Republic of Kazakhstan until 2025 pay special attention to the key aspects necessary to create a modern, competitive educational system and successful digital transformation. This initiative reflects the basis of the scientific project, which will be mentioned in other state-level documents regarding the implementation of the developed measures.

Both strategies emphasize the importance of developing the education system, training and retraining of personnel. The focus is on

modern educational methods adapted to the needs of the digital economy in the field of higher education. This includes developing digital competencies among students and professionals.

The strategies include ensuring access to all levels of educational resources and programs for all categories of the population, using both desktop and mobile devices. This is aimed at increasing educational accessibility and meeting the needs for training in state and Russian languages.

Government strategies, both in the long and medium term, make digital competencies a mandatory element of professional standards. This includes the creation of digital continuing education institutes and accredited testing centers to validate digital literacy.

The documents recognize the need to train specialists in the field of information technology and focus on the development of relevant competencies and skills for Industry 4.0. This includes scaling innovative programs and increasing the production of IT professionals.

DIGITALIZATION OF HIGHER EDUCATION IN TÜRKİYE

The process of digitalization of higher education in Türkiye, which began with the opening of distance learning departments of universities, soon turned into a large system covering about two million students. Since 2008, Türkiye has experienced rapid growth in tertiary enrollment and reached the developed country in 2012. Distance departments of universities played a very important role in this process (Günay, 2016; Ozoğlu, 2015).

The first stage of digitalization of higher education in Türkiye

In 2018, a year before the start of the global epidemic, the Council of Higher Education of Türkiye (hereinafter YÖK) announced an important project related to distance education called "Digital Transformation in Higher Education." (YÖK 2019).

The main goal of the project is stated as increasing the digital competence of teachers and students. This project, which was brought to life under the slogans "New YÖK" and "Digitalization -YÖK", was implemented in the first stage in 8 pilot universities in the regions of Eastern and South-Eastern Anatolia. (Agry Ibrahim Chechen (Agry), Bayburt (Bayburt), Ygdir (Ygdir), Munzur (Tunjeli), Mush Alparslan (Mush), Siirt (Siirt), Shirnak (Mush) Shirnak), Bingol (Bingol) Regional universities that were created after 2006 and developed in relatively more difficult conditions were selected as pilot universities.

Ardahan, Artvin Coruh universities, which were identified as the 2nd stage within the framework of the "Digital Transformation Project in Higher Education" at a meeting entitled "Türkiye Window of Opportunity: "Turkish Higher Education"", which was held in Mush on July 16, 2019 and whose agenda was "digital transformation and literacy." A protocol on including a total of 8 more universities in the project, including Batman, Bitlis Eren, Gümüşane, Hakkari, December 7 Kilis and Osmaniye Korkut Ata University, was signed between YÖK President Saraç, YOK Executive Board Member Gündoğan and the rectors of the universities. Thus, the number of universities under the project was increased to 16 (YÖK, 2019).

As part of this project, about 100 thousand students and about 12 thousand teachers were trained in this subject as part of the "Learning and Teaching in the Digital Age" programs. Therefore, according to the chairman of the Council of Higher Education of Türkiye for this period, Yekta Sarac, these universities, as part of the project, were actually more prepared for the global epidemic.

In the student part of the project, in the spring semester of 2018-2019, the course "Digital Literacy" was added to the curriculum of pilot universities. About 40 thousand students at pilot universities were trained in courses "Internet technology", "Portable technologies",

"Social networks", "Technology, society and people", "Information ethics", "Technology and lifelong learning", "Cloud computing" "within the scope of digital literacy courses", "future technologies". The program was organized in collaboration with Anadolu University on the course "Learning and Teaching in the Digital Age." 10 thousand 725 teachers took online courses, and 61 thousand 346 students took the Digital Literacy courses for one semester of credit (YÖK, 2019).

The second stage of digitalization of higher education in Türkiye

On March 16, 2020, in the second phase of the project, in addition to these 16 universities, training on the topic "Cyber Security and Network Management" began for teachers in 5 newly established technical universities in Anatolia. In addition, as part of the project, it was planned to conduct a one-semester credit course "Cyber Security" for university students.

After signing the protocol, Türkiye moved on to the third stage of the digital transformation project in higher education. At this stage, a completely domestic distance education platform was developed by Sakarya University (was put into operation in 15 universities under the coordination of YÖK and in cooperation with TÜBİTAK-ULAKBİM. In the autumn semester of the 2020-2021 academic year, 15 universities participating in the project began to conduct distance learning courses education through this local platform.

The process of integrating Turkish university archives into the European Open Access framework has been started and attention will be paid to the use of Researcher ID (ORC-ID) numbers. Research on this issue was carried out in collaboration with TÜBİTAK.

In 2020–2022 a number of studies were conducted in Türkiye to study the effectiveness of digital technologies and analyze the key problems and risks that arose in connection with the transfer of universities to a distance learning mode during the introduction of strict restrictions associated with the coronavirus pandemic.

One of the largest studies was conducted by the Council of Higher Education (YÖK) in 2021. In this study, 1 million 255 thousand students and 27 thousand 820 teachers from 207 universities were surveyed in order to identify opinions on online learning conducted in higher education institutions in time of global epidemic.

As a result of the survey, 83% of students and 97% of teachers said that they have electronic devices that provide access to distance education, and 89.6% of teachers and 97% of students reported that their Internet access is sufficient.

90% of students said they could benefit from course materials and course content offered through online learning, and 25% said the fact that courses were delivered online had a positive impact on their learning. 48% of students said that online learning had a positive impact on their educational life or that the effect was minor, and 37% said they spent more time on themselves and studying while studying online.

While 69% of teachers said they were spending more time preparing for classes, 43% said both student participation in classes and their performance levels had decreased.

61% of teachers said that the impact of online learning on academic activities other than teaching had not changed or had a positive impact on them, and 64% said that they did not experience any serious difficulties in delivering instruction effectively.

In the survey, 74% of educators said they had gained new technology and teaching skills, while 61% of those surveyed wanted instruction to be online for the spring semester, 26% wanted it to be hybrid, and 13% wanted it to be in-person-face.

After the pandemic period, 44% of teachers preferred that training be face-to-face, and 56% preferred that courses be delivered online or with online support (YÖK, 2021).

The third stage of digitalization of higher education in Türkiye

After the pandemic, the epidemiological situation in many cities of Türkiye, with the condition of vaccination of all subjects of the educational process, allowed universities to return to the full-time format of education. According to data published by the Turkish Ministry of Health on 02.11.2021, 79.21% of university students, 90.70% of administrative staff and 93.27% of academic staff have been vaccinated (Yüksek Öğretim Kurumu, 2021). As part of anti-virus measures, classes were limited to 30 minutes in the first months. Also, the Council of Higher Education (2020), in its resolution "New rules in the process of combating the global epidemic II", decided that 40% of courses will henceforth be conducted remotely.

In the third phase, it was planned to conduct training from January 2021 to August 2021, prepared in collaboration with Cisco-METU. At this stage, 90 scientists from 30 universities selected from Anatolia had the training.

Among the digital technologies that support organizational and management activities, electronic document management, accounting, personnel records and other types of resources, planning the needs of the organization, and analyzing the financial condition of the organization are actively used. A separate direction in the development of Digital Transformation (DT) in education can be considered the digitalization of procedures for assessing the quality of education (AQE).

Current problems of digitalization of higher education in Türkiye

During the pandemic, a number of studies were conducted at Turkish universities to identify pressing problems in the distance education process. In his study, Can emphasized the importance of not only quantity but also quality in open and distance education (Can, 2020).

In a study conducted by Keskin and Ozer Kaya involving 652 students, it was found that the time students spent in front of social media and television approximately doubled during the pandemic. Most students said that distance education was not as effective as face-to-face education. In addition, it turned out that within the framework of the distance educational process, problems such as low academic performance are observed; loss of students' ability to be creative and take initiative; a formal attitude towards the tasks performed, which affects the quality of education; harmful effects of computers on mental and physical health; a sense of false competence when students equate access to information with mastering competence; weak level of socialization. (Keskin & Kaya, 2020)

Although some universities provided training through distance education, due to the suddenness of the process, most universities were unprepared for emergency distance education (Yavuz, 2020). Especially during the first period of the pandemic, the issue of digital literacy of teaching staff was acute.

The teacher is a key figure in the education process and in the process of digitalization of education. The sudden shift to distance learning has caused teachers difficulties in preparing course materials (Dahmash, 2020). Faculty who continued emergency distance learning courses during the pandemic had to prepare and use their own course materials for use in their courses. It can be said that especially teachers who are used to teaching courses in formal education have had to change the way they teach courses during the pandemic process.

For preparing online lessons, online lectures, online tests, online courses, etc. Universities organized courses for teachers to become fluent in information and software.

The transition to distance learning and the associated limitation of social contacts and direct interaction led to a loss of group student solidarity and cohesion. The learning process is also challenging for distance learning students, on top of the stress caused by the pandemic. Thus, according to the study by Kürtüncü and Kurt (2020), during the emergency transition to distance learning, the main difficulties faced by students relate to changes in the usual

patterns of organizing educational activities, maintaining motivation to learn, and maintaining productive contacts with teachers. At the same time, the impact of the online form of learning on communication "student – student" and "student – teacher" was assessed ambiguously by students. Most students reported feeling tired and powerless after participating in online classes, attributing their condition to a lack of emotional connection and exchange.

Current problems of digitalization of higher education in Kazakhstan

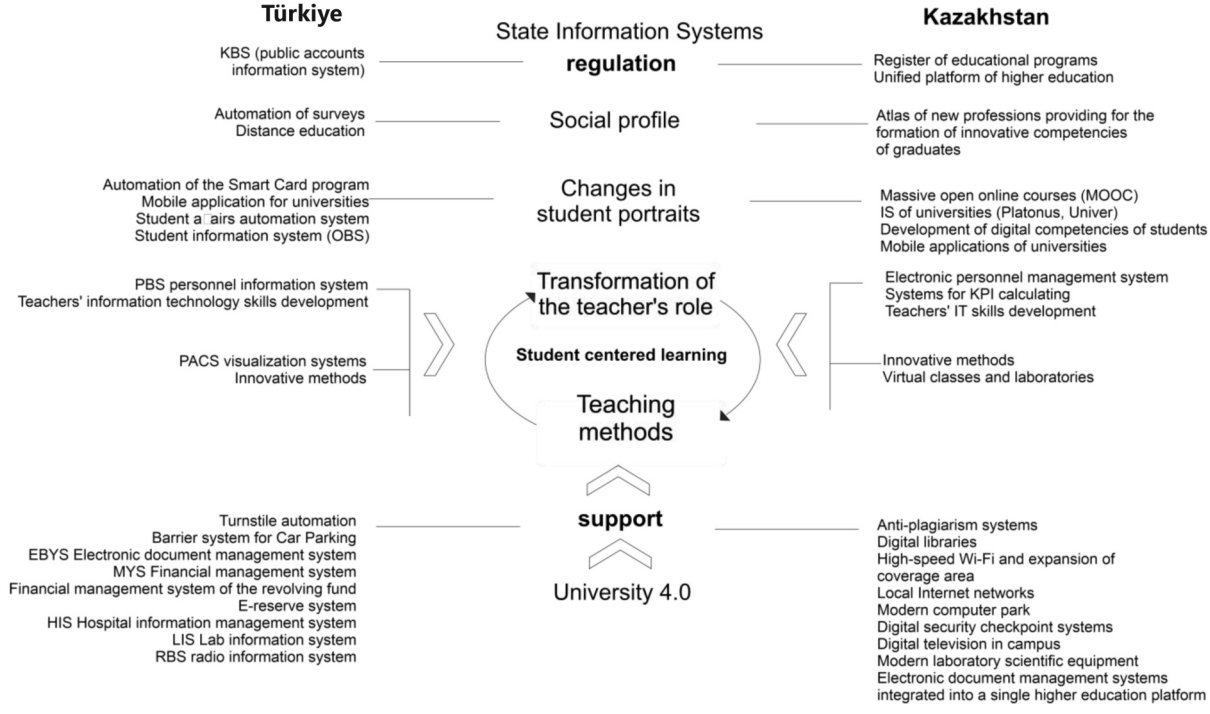
In Kazakhstan, one of the main problems of digital transformation is also the development of IT skills of teachers, due to changing requirements for university teaching staff in the context of digitalization of education and the active introduction of information technologies into the educational process.

At the same time, a set of questions arises related to digitalization processes. In particular, a significant amount of funding is needed for initiatives to introduce digital technologies, develop online courses and digital university products. Another problematic issue is the professional training of IT specialists, the emergence of a need to update the regulatory framework for the digital transformation of education and an effective system for monitoring the digitalization processes of universities. In addition, the relevance of training highly qualified specialists in Kazakhstan in the field of cybersecurity and technological innovation is rapidly increasing.

Thus, current activities in the field of digital transformation of higher education in Türkiye and Kazakhstan are aimed at the widespread use of information technologies in various university management processes. A graphical interpretation of the current state of the use of digital technologies in the higher education system by country is presented in Figure 1.

The analysis showed that in both countries there is an intensive digital transformation of higher education, due to the growing need in

Figure 1 Application of digital technologies in the higher education system at universities in Türkiye and Kazakhstan



both countries for specialists of a new generation for the knowledge economy. At the same time, specialists with innovative competencies are the product of a flexible educational environment focused on the needs of the individual and production. States are striving to regulate the processes of digitalization of higher education through the launch of centralized information systems related both to the management of financial activities and aimed at regulating the quality of implemented educational programs.

The change in the social profile of students, which occurs due to the increase in IT competencies through the development of distance education, identifying the need for the skills being developed, entails the need to shift the focus from the personality of the teacher to the needs of the student. Thus, there is a need to transform methods and forms of teaching, develop the competencies of teachers in a digital educational environment. At the same time, it is necessary to both develop the infrastructure of universities and integrate various information systems with each other.

At this stage, it can be noted that digital transformation in both countries is being implemented at a high pace in accordance with government strategies. In this case, the central factor is student focus, developing the competencies of teaching staff and increasing the digital capabilities of universities.

CONCLUSION

Digital technologies play a key role in modern higher education, transforming the traditional academic process into a more dynamic, creative and individually oriented environment, which allows one not to be tied to classroom lessons, a uniform pace and volume of material studied, and opens up unlimited opportunities for creativity, individual research and development, as well as virtual collaboration and access to the highest quality sources of information.

Having analyzed the trends in the development of digital education in universities in Türkiye and Kazakhstan, we can conclude that countries are striving for the mass introduction of digital learning at all levels of education, thereby forming a digital society. At the same time, the role of the teacher is changing, innovative methods and forms of teaching are being introduced; The role of non-formal education, regardless of place and time, is significantly increasing.

The basis for the ongoing changes in both countries is a systematic state policy for the digital transformation of the industry, the creation of state information systems that regulate certain issues of higher education, such as finance and the quality of educational programs.

In conclusion, in the era of Industry 4.0, higher education is undergoing significant transformations by introducing digital technologies into the educational process. These changes are visible in the use of online resources, hybrid teaching methods, assessment systems, and the integration of artificial intelligence and virtual reality. Key trends such as individualized programs and student-centered approaches are becoming the foundation for modern education. Technological innovations such as MOOCs platforms and interactive materials are redefining educational standards, and blended learning effectively enhances these processes. Despite the democratization and improvement in the quality of education, challenges are emerging, such as uneven application and poor quality of teaching in the field of blended learning. The successful implementation of these trends requires strategic planning, the development of a focused methodology, an in-depth study of the problems of online education, as well as the provision of the necessary resources and equipment.

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