What Experience and Survey Say About University Digitalization in Kazakhstan?

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Abstract

The article is devoted to the study of ways that can solve the problems of digitalization of Kazakhstani universities. The study reflects the need for innovation in such a sector of the economy as higher education, the creation of a digital ecosystem and the development of human capital. The idea to enrich these areas in universities with digital technologies requires knowledge of what experience domestic and foreign university structures have in order to clarify the missing managerial and technological components in the Kazakh digitalization process. Identification of omissions in the digital activities of the university is complemented by studies of the impact of digital technologies on the educational activities of students. The results of the student survey are presented in three sets of questions. The analysis considers such aspects of the problem as the positive and negative impacts of technology on the learning activities of the digital generation of students. Special attention is paid to studying the attitude of students to education digitalization, and the training environment of the university. In the article some arguments of teachers about the results of the conducted research. The novelty of the article lies in updating the issue of the impact of digital technologies on the educational activity of the modern generation of the Kazakh students, which deserves special attention in the sense of university management quality. In addition, it was figured out whether the online, offline or blended mode of learning the Kazakhstani students prefer.

Keywords

Digital Kazakhstan, digital transformation, university digitalization, digital technologies, Independent Distance Learning Resources, online learning, offline learning, mixed learning

1. Introduction

The article's goal is to describe the experience, analyze problems and offer some prospects for digitalization of the Kazakhstani universities. Since 2018, the State Program "Digital Kazakhstan" has been implementing in five key areas:
1. Digitalization of economic sectors;
2. Transition to a digital state;
3. Implementation of the Digital Silk Road;
4. Development of human capital;
5. Creating an innovation ecosystem.

The Digital Kazakhstan program supposes improvement the quality of education along with healthcare, help to increase the efficiency and transparency of public administration, ensure

employment, as well as improve the investment climate, increase labor productivity and increase the share of small and medium-sized businesses in the structure of GDP [1].

Even before the start of the program, universities used various online platforms to organize the educational process and formation of an electronic learning and teaching environment. The pandemic forcibly changed the format of education from full-time to distance learning. Subsequently, in accordance with the epidemiological situation, universities used online and offline training. The interaction of professors and students, various social practices and the management process have changed.

Hence, the digital transformation has become a reality for higher education as well. The education system needs operational regulation to meet the challenges in the new civilization conditions. Along with positive outcomes such as virtual learning environments, online platforms and digital technologies, universities found a lack of specialized resources for online education, the unpreparedness of faculty members, leadership and students for distance education. Little universities' experience of working in the digital transformation found low level of information culture, mismatch of existing knowledge and skills with new technologies and as a consequence lack or insufficient technical, methodological and psychological handiness of academic teachers for online learning. Along with the elimination of these problems, the inculcation of the norms of information culture and raising the general level of culture for the new forms development of "student-professor-administration" communication according to the authors is seen as paramount.

Methodology of study is based on study of the domestic and foreign universities' digitalization from the one hand. From the other hand, the influence of digital technologies on the educational process was examined through the rank of surveys of students of the local Universities. As a result, an understanding of the advanced matter of university's digitalization abroad, managerial and technological missing components in Kazakhstani process were found. In addition, the opportunities and possible ways of eliminating the undeveloped position and further deepening The article presents results of questioning of students on three blocks of questions as well. The authors consider such aspects of the problem as positive and negative impact of technology on the learning activities of the digital generation of students during data analysis.

The article provides besides a literature review, the international cooperation's experience, some reasoning of teachers about the results of the research work. A complex of scientific research methods was used: theoretical (analysis of scientific pedagogical literature on the problem under study, analysis, generalization, identification of the rational component of the study) and empirical (questionnaire, conversation, discussion).

2. Magnitude and Causes of the Problem

Currently, the world's universities have to experience the transition from traditional forms to digital and hybrid models of the educational process. It is vital common sense to define criteria for evaluating computerized learning situations in universities and their research activities. Students from some countries abroad asked to agree on the advanced learning situations of universities and the formally dysfunctional implementation of this task in practice. In Kazakhstan, most students prefer mixed modes of training in the forms of online and offline learning according to the original research [2].

Analysis of existing research on the declared topic showed that in the center of attention of scientists is the transition from the traditional learning models to digital ones. A number of researchers are viewing the digitalization of learning as a necessary condition for the transition to digital era focused on growth performance, new types of labor, and the need for human nature. Digital technologies are seen not only as a tool, but also as an environment of existing, as well as a means of development of future-oriented competencies [3].

2.1. Domestic and foreign experience of university digitalization

To understand where we are in the process of transformation in digital time, the domestic and foreign experience of university digitalization was analyzed in order to clarify the progress and fails

in the field by the Kazakhstani higher school. Based on states of research methodology, the world experience of advanced universities, the attempt of a digital environment creation rather than a digital university was revealed. The digitalization of world universities is expressed both in online support and in personalization and interaction. Online support, along with documents for confirmation on websites and video tutorials, means the involvement of digital technologies into the process of management at the administrative and pedagogical levels. The original study of the program documents of Kazakhstan, the analysis of the digital literacy of staff and digital maturity of university under the COVID-19 have shown missing components of universities digitalization in Kazakhstan. These findings allow working out some ways of transformation of the RK's universities digitalization based on the foreign experience.

The desire to be competitive, universities must comply with global trends, including in the field of ICT. In the second half of the 1990s, universities began to take steps to organize distance learning predominantly for correspondence form. Subsequently, the Ministry of Higher Education and Science began to regulate this area by establishing a requirement for licensing distance learning with the very strict sets of rules.

The order of the Minister defines the requirements for the provision and rules for organizing the educational process for distance learning [4]. In addition, our experience of digitalization in the field of education shows the use of various terms by academic and other structures. In addition to the above terms online learning, electronic learning or e-learning are used. However, the Civil Code of the Republic of Kazakhstan refers only to remote work. Such terminological inconsistency does not oblige universities to fulfill certain rights of employees in connection with the new form of organization of their activities, provided by law. While foreign structures located on the territory of our country, provide technical, financial and other support to our own citizens working in these organizations.

The pandemic, which suddenly arose, found the country's universities in varying degrees of readiness for new conditions, forced universities to reconsider traditional approaches and became the starting point for creating the education of the future. Finally, universities changed the attitude towards online learning. Remote work is established both at the conclusion of an employment contract and during the term of the employment contract with the introduction of amendments and additions to the employment contract [5]. In order to switch to remote work, it is necessary to comply with the requirements established by law. It is necessary to clearly spell out all the conditions for remote work in an employment contract and in an additional agreement to it and for notifying an employee, drawing up relevant documentation, and in order to avoid disagreements with an employee engaged in remote work.

Based on states of research methodology, the world experience of advanced universities, the attempt of a digital environment creation rather than a digital university was revealed. The digitalization of world universities is expressed both in online support and in personalization and interaction. Online support, along with documents for confirmation on websites and video tutorials, means the involvement of digital technologies into the process of management at the administrative and pedagogical levels. The further progress of universities on the path of digital transformation is seemed by introduction and use of the Independent Distance Learning Resources with elements as Academic Support, Virtual Learning Environment (VLE), Heriot-Watt Online Library Services, Discussion Boards, and Administrative Assistants [6].

Missing components of universities digitalization in Kazakhstan includes insufficient online support, lack of video lessons, depersonalization in digital learning, lack of competitive elective courses, lack of practical oriented cases, underdevelopment of interaction in online support and underdevelopment of career support for and community communication. International IT University, being one of the best technical universities in the country, studies digitalization processes at the world technical universities Digitalization experience of the Heriot-Watt University the high ranked Scottish and British higher school and one of the 350 best universities in the world, University provides the independent distance learning system. Academic Support, Virtual Learning Environment, Heriot-Watt Online Library Services, Discussion Boards, and Administrative Assistants present the system.
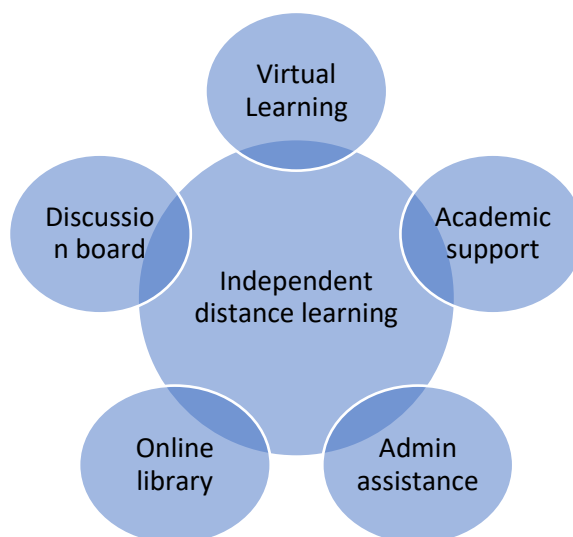
Figure 1. Independent Distance Learning Resources

Each resource of the DLR system has own functions. Academic support of tutors while students studying through IDL is targeted the students will not be alone. Tutors should use phone, email and similar to what students receive on campus. Detailed course materials should be uploaded and be available through the updated virtual learning environment. Access to discussion boards allows students to connect with teachers and other students. Schools should offer special administrative support for all distance learning students. The friendly receptionists can help with any non-academic questions the students may have. So, these activities will complement the academic support are available.

To perform key tasks such as remote email access, use of virtual learning environment, online tuition and residency fees, and more a number of web-based applications are available in Web Application Learning Resources:

1. Study spaces;
2. Information Services;
3. Vision;
4. Research support;
5. Webmail;
6. Eduroam;
7. Online payments;
8. Study skills development;
9. Researcher skills development.

Web Application Learning Resources structure and contents:

1. Vision is a virtual learning environment that provides a learning environment to get access to most of the course materials (lectures, video tutorials, tests); online discussion between students and teachers using online boards.

2. Webmail - using Microsoft Office 365 tools, SharePoint and integrates with existing tools such as Yammer, Skype for Business, and OneNote a new digital workspace has been implemented that allows employees to connect to all key tools they need to get the job to be done.

3. Study spaces through the library schedule to be mailed to students, or students may want to use a photocopying service.

4. Information services have an online directory, online services and databases allowing access to a variety of magazines, articles and e-books as an extensive service for distance learning students.

5. Eduroam is wireless services to staff and students on campus with the following benefits as wireless traffic is encrypted making it more secure, better bandwidth, and access to the resources of the HWU library.

6. Online payments service is an easy and flexible way to pay tuition, room fees and other unpaid bills.

7. Researcher skills development. Research Futures Student Workshops RFSW are for PhD and future research careers and internal opportunities and have three-minute thesis competition for graduate students. RFSW enable students to acquire the skills they need for further research careers and outside academia students from different schools. Study skills development offers a wide range of skills development opportunities on campus and online for developing students digitally, information literacy, information technology, and learning skills to help students to work, research and learn more effectively, and support ongoing professional development.

8. Research support provides training, specialized services and resources to support graduate students and researchers throughout their careers, helping them find and manage information, and disseminate and publish research results.

Thus, the Kazakhstani and foreign structures of higher school are on the way of a digital environment creation rather than a digital university itself. Online support is targeted at facilitating university operations management, creating digital infrastructure by the usage of platforms, websites and distance learning. Whereas personalization and interaction the student-oriented approach and progress in information culture and online communication. Insufficient online support, underdevelopment of interaction in online support, depersonalization in digital learning, underdevelopment of career support and community communication, lack of competitive elective courses, lack of practical oriented cases, lack of video lessons make up missing components of universities digitalization in Kazakhstan.

This lack of digitalization of the domestic universities at the same time constitutes the path of development. Implementing the Independent Distance Learning Resources with elements as Academic Support, Virtual Learning Environment (VLE), Heriot-Watt Online Library Services, Discussion Boards, and Administrative Assistants will hopefully deepen a digital universities' transformation in Kazakhstan towards a higher quality of education.

2.2. Digitalization and students training

The literature review has shown that the problem of the influence of digital technologies on the educational activities of students has not yet been sufficiently disclosed. To clarify how digital technologies influence on the educational students' activities of the Kazakhstani Universities a survey was conducted on three blocks. Most respondents are from International IT University. Data analysis considers such aspects of the problem as the positive and negative impact of technology on the learning activities of the digital generation of students. Special attention is paid to studying the attitude of students to the digitalization of education, their learning within the digital educational environment of the university.

Questions in the questionnaire were prepared based on the article "Some results of the study of the impact of digital technologies on students' learning activities" [7]. Questionnaire was conducted online among students of Kazakhstan and consists of three blocks. General questions included five questions like age, gender, place of birth, university name and year of study. Block 1 included three questions on spending time in the Internet, aim of using Internet and type of the equipment used. Block 2 consisted of seven questions. Questions were about educational resources, study material, type of services, web-sited used by students for educational purposes, their opinion concerning digital technologies influence. Block 3 had four questions. They were related with the teachers using the digital technologies in their lessons.

There were 197 respondents in the survey (March 8, 2022). 38% are male and 62% are female. Their age is between 17 and 24. 47% of respondents are from big cities like Almaty, Astana and Shymkent, and 53% are from other oblasts. The respondents were divided into the year of study as follows:
- 1st year students – 64;
- 2nd year students – 71;
- 3rd year students – 23;
- 4th year students – 39.

The results of Block 1 (Table 1) are given below in percentage. As it turned out, 52% of students spend online more than 3 hours a day, of which 45% - over 6 hours. Students spend most of their time interacting with others, networking, as well as for entertainment – watching videos, movies, playing online games, reading and creating Instagram reels and Tik-Tok stories. Smartphones provide access to information and replaces other digital devices.

Table 1
Usage of the digital technologies by students of the Universities

Question	Variant of answer	Survey results, %
Block 1		
What time do you spend online?	No more than one hour.	4
	More than three hours.	52
	More than six hours.	45
For what purpose do you go online?	Learning activities.	35
	Communication.	30
	Recreation and entertainment.	35
What digital devices do you use more often?	Mobile phone.	80
	Computer.	18
	Tablet, e-book, watch video.	2

Compiled by the authors based on own survey results.

Thus, students seem to be actively using digital technologies to prepare for classes. At the same time, as the teachers said in an interview, students only superficially consider the information necessary to answer the questions posed, since they basically do not understand the educational material, do not pass it through their own consciousness, but only run their eyes over the screen of the device.

The second objective of the study was to study the impact of digital technologies (DT in table) on the educational activities of students. The results of Block 2 (Table 2) are given below in percentage.

Table 2
Impact of digital technologies on the educational students' activities of the Universities

Question	Variant of answer	Survey results, %
Block 2		
How often do you use educational resources?	Often/systematically.	59
	Not very often/occasionally.	38
	Rarely.	3
What network services do you use for educational activity?	Search systems.	66
	Educational web sites.	21
	Information resources.	13
Where do you prefer find educational information?	Internet.	95
	Library fund.	1
	Archive, reading room of the faculty, educational publications.	4

Do you think that DT application of renders positively effect on your educational activity?	Yes, DTs allow me greatly improve the quality of learning activities.	73
	The use of DTs does not affect my learning.	24
	The use of DTs allows me good study but quality of learning activities are not getting. Better.	3
Do you think that using DT has an effect on your educational activity negatively?	No, the use of DTs does not negative impact on learning activities.	72
	Yes, DT takes a lot of time, which I could dedicate study.	21
	Yes, I became (a) worse at school because of use of DTs - I get distracted, I think in fragments, I do not delve into issues studied in depth.	7
Do you think that you rely too much on DT during studying?	Yes, I rely too much on DTs, I can quickly find what I need information, but not for a successful educational activities.	23
	Yes, I rely on DTs, but I need to get information for successful educational activities.	57
	Only DTs allow me to learn at least somehow. Without them I would not coped.	5
	I don't rely on DTs, I use them only as an auxiliary means of learning activity.	15
Do you think that usage of mobile devices (smartphones) in the classes disturbs you to study?	Yes, smartphones are distracting.	22
	No, smartphone can be used to perform assignments.	65
	No, I can copy the answers if necessary.	1
	No, I use my phone in the class not for study. I answer messages and use the Internat. It does not disturb me from learning.	12

Compiled by the authors based on own survey results

Data analysis shows that students get access to the educational resources systematically (59%). 38% of the respondents turn to educational resources occasionally. If we consider the aggregate positive feedback, it can be noted with satisfaction that most students still turn to educational network resources.

Most often, students turn to search systems that provide quick and immediate access to the right sources of information (66%). As they themselves comment, often this is done right in the classroom, during the survey, permission problematic task, performing calculations. In addition, educational websites (21%) and other information resources (13%) for learning activities are used.

The students prefer finding the information on class topics on the Internet (95%). Only 1% of the respondents attend the library, and only 4% use archive, reading room of the faculty, and educational publications. Majority of the respondents agree that using DTs allow them greatly to improve the quality of learning activities (73%). 3% of students are not happy with the quality of learning activities using DTs.

Main portion of the students (71%) agree that using DTs in classes do not have negative impact on learning activities. 21% of students complain that that time could be dedicated for other activities. At least, most of the students (57%) confirm that they rely on DTs to get information for a successful educational activity. 65% of the respondents agree when teachers use smartphones in the assignments. Some of them (22%) say that it distracts them and only 1% answers that they copy answers if they need. 12% of respondents use smartphones for their own needs.

Although the students responded they do not believe that digital transformation has a negative impact on the learning process, they are not fully aware of this and think about the consequences incorrect use of digital technologies only when they are asked direct questions about the issue.

The work of students in the library is becoming an increasingly unpopular activity. An extremely small number of students turn to library collections. Students prefer to access information on the Internet rather than "wasting time" studying primary sources in reading rooms and libraries.

The Kazakh teachers identified the problem of cheating while commenting on the lack of improvement in the quality of students' learning with using digital technologies. According to teachers, the use of digital and network technologies provides unlimited opportunities for cheating assignments, answers to control work and tests. Teachers are unanimous that most students abuse using mobile devices while attending lectures or practical classes. They believe that learning activity in such cases is not leading for the student. In the same spirit, academic teachers of foreign countries express their opinion, in particular Buryat State University named after Dorzhi Banzarov [6].

The third objective of the study was to study professionalism of the teachers at IITU by students' point of view. In addition, at identifying the intensity the use of digital technologies in the educational process and the study of students' attitudes towards their use in teaching. The students also had to rate information culture of teachers. Block 3 (Table 3) consisted of five questions and the results are as follows.

Table 3

Usage of digital technologies in the lessons by teachers at the Universities

Question	Variant of answer	Survey results, %
	Block 3	
1. How often do teachers use DT in their classes?	Often.	46
	Rarely.	26
	Never.	5
	Give homework using DT.	23
2. What digital learning tools do teachers use in your classes?	Training programs.	15
	E-books.	18
	Educational web sites.	5
	Internet resources for searching information to perform projects.	9
	Educational platforms (MOODLE, Teams).	51
	Mobile apps and web services (Skype, e-mail, blogs).	2
3. How can you assess the level of DT proficiency of your teachers?	Low.	2
	Medium.	47
	High.	51
4. What is the reason for the insufficient use of digital transformation in the classes?	Teachers do not know how to use the DT.	7
	Unsatisfactory conditions for organizing the educational process: bad computers and software, limited number of hours for studying the discipline, unorganized digital educational space of the university.	39
	Insufficiently developed teaching methods with the DT.	54
5. Would you like to see more lessons using digital technologies?	Yes, studying would be more interesting.	43
	Yes, it would allow me to study when it is convenient for me.	32
	No, it will lead to more workload requiring additional time to complete.	12
	No, I already spend too much time online and at the computer.	11
	No, because the role of digital technologies in the educational activities of university students is overestimated.	2

Compiled by the authors based on own survey results

These studies have shown that teachers often use digital technologies in the classroom, which was noted by almost half of the respondents - 46%. Answering the question is to assess the level of

proficiency digital technologies for teachers. It was rated as high - 51%. Moreover, during the conversation, the students explained that their teachers improve their pedagogical skills, introduce of educational innovations in teaching, and take into account the interests of the new generation of students. Among the means of learning, a significant part of the respondents (51%) indicated educational platforms in the educational process. It is a platform MOODLE, which creates extensive opportunities for creating digital educational environment. This case seems to be as a merit of IT department and high level of university management but not a practice of teachers. The following data proof that teaching process stands more on traditional tools and methodology than on digital technologies. 18 % of respondents refer to the use of e-books programs and 15% of training programs, and the least mentioned are mobile applications and network services (2%), educational web sites (5%) and the Internet resources for searching information to perform projects (9%).

Availability of teachers' accounts in social networks and active use of Internet services, their ability to navigate well in digital educational space, to involve students in the educational process, organized on the basis of the digital environment of the university allows to assess the level of knowledge digital technologies among teachers as high.

The main reason limiting the use of digital technologies in students' training is the conditions for the implementation of the educational process, i.e. unsatisfactory computer park and software, limited number of hours for studying discipline, poor internet connection, unorganized digital educational space of the university. 39 % respondents noted this. 54 % of respondents believe that insufficient development digital learning methodology also hinders their use in the classroom. Students suppose that teachers do not use digital technologies in the classes due to insufficiently developed teaching methods with the DTs (54%). However, they think that using the digital technologies makes their lessons more interesting (43%).

These studies have shown that digitalization in the classroom is limited by the very nature of the learning process itself. Given the presence of certain omissions in the transformation in digital time, insufficient digital creative environment and not high digital maturity of students, teachers and staff, it can be concluded that digital transformation in a university can be organized not purely online or purely offline, but in a mixed form.

Various aspects of digital learning for university students need to be explored more in terms of describing their practical application. Introduction to the experience of teaching disciplines by using various methods and means of digital educational environment will allow teachers to implement them in their own practice. The practice of pedagogical activity indicates that the socialization of young people in networks and all sorts of entertainment offered on the Internet is currently much higher priority activities for students using digital technologies than the activity of learning, which, unfortunately, is not supported by relevant motives and does not always correlate with life values younger generation.

The responses of surveys and interviews prove that being online while learning allow a student to be distracted by games, entertainment, and watching videos and lead to a decrease in the quality of learning. Therefore, the digital technology has a negative impact on students' training if their application is not dressed in a clearly developed outline of a specific pedagogical technologies working in the digital educational environment. Taking into account that the leaders of universities and experts are ready to cooperate and direct joint efforts for the implementation of prior national projects in education and digital economy, the further discussion in the field of digitalization's issues have an opportunity to be figure out [8].

3. Conclusion

During a global technological transformation that has also affected universities, it is important to understand what domestic and foreign experience and original research has taught us in terms of the digitalization of higher education. Lessons are always instructive and require study, because they allow to find not only positive and useful activities, but also to identify omissions and shortcomings. However, the general trend for these countries is the way of creation of a digital environment rather than a digital university itself. It was found that online support is targeted at facilitating university operations management, creating digital infrastructure by the usage of platforms, websites and

distance learning. Whereas personalization and interaction the student-oriented approach and progress in information culture and online communication have not been achieved. The socialization of youth in networks has currently a much higher priority than learning, which, unfortunately, does not supported by appropriate motives and does not always correlate with the life values of the younger generation, and these have shown that digitalization in the classroom is limited by the very nature of the learning process itself. Given the presence of certain omissions in the transformation in digital time, insufficient digital creative environment and not high digital maturity of students, teachers and staff, it can be concluded that digital transformation in a university can be organized not purely online or purely offline, but in a mixed form. Research prompts that a digital transformation needs to be dressed in a specific pedagogical technology working in the creative digital environment. In this connection, more techniques and innovation are needed to maintain in digital transformation.

4. Acknowledgements

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