European Proceedings of
Social and Behavioural Sciences
EpSBS

www.europeanproceedings.com
e-ISSN: 2357-1330

DOI: 10.15405/epsbs.2021.09.02.120

ICEST 2021
II International Conference on Economic and Social Trends for Sustainability of Modern Society

DIGITAL TECHNOLOGIES IN THE HIGHER EDUCATION SYSTEM

I. P. Uimanova (a)*, D. N. Bilalova (b)
*Corresponding author

(a) Ufa State Petroleum Technological University, Branch in Salavat, Gubkin Street, 22B, Salavat, Russia, uimanova_ira@mail.ru
(b) Ufa State Petroleum Technological University, Branch in Salavat, Salavat, Russia, dinabil2015@yandex.ru

Abstract

The topic of the use of digital technologies in the field of education in connection with the development of information technologies and the changing requirements of the modern labor market is currently very relevant. Modern life dictates its own conditions, now employers need specialists who have the skills to freely use electronic technologies in their professional activities. Digital technologies are an integral part of public life and open up wide opportunities the development of competencies in the professional sphere. The article discusses the main digital educational technologies, including: cloud technologies, mobile space, web quest, online courses. The aim of the study is to reveal the essence of digital technologies in the educational space and to determine their advantages, which include visibility, accessibility, orientation to the individual abilities of students. The article discusses the theoretical and practical problems of using digital technologies in teaching humanities at a technical university. The results of our research have shown that the competent use of innovative technologies in the educational process contributes to the formation of positive motivation among students, allowing them to make it as effective as possible, meeting modern realities. It is argued that digital educational technologies in the educational space are a necessary condition for improving the efficiency and effectiveness of the educational process.

Keywords: Digital technologies, web quest, online course, educational space, Internet resources

https://doi.org/ 10.15405/epsbs.2021.09.02.120
Corresponding Author: I. P. Uimanova
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

1. Introduction

On September 3, 2018, the Presidium of the Presidential Council for Strategic Development and National Projects approved the national project "Education" for the period from 2019 to 2024. One of its goals is to create a new and secure digital educational environment by 2024, which will ensure high quality and accessibility of education of all types and levels of training. To achieve this goal, the use of innovative digital technologies is proposed (National Project “Education”, 2020).

The situation that has developed in the world in connection with the pandemic has caused the need for a new format of training. The main one was distance learning, which accelerated the process of integrating innovative digital technologies into education. With proper organization of digitalization and elimination of the shortcomings that were discovered during the quarantine, education will become more accessible, modern and flexible.

Technologies of the XXI century are designed to help students gain knowledge and improve their competence, develop communication skills. If we compare traditional methods of control, the main advantage of integrating digital technologies into the educational process is that the educator can control the effectiveness of the educational process, the understanding of the educational material, as well as the time spent by the student on solving a particular problem (Bilalova et al., 2020).

One of the innovative directions in the education system is the creation of an electronic educational environment. The development of digital technologies in education is the main aim of professional training, which allows developing the competitive qualities of students on the way to highly qualified specialists. In this regard, the central task of the teacher is the use of digital technologies in the educational process, taking into account the individual abilities of the student.

2. Problem Statement

The modern labour market has created a need for the training of highly qualified personnel, and therefore the use of innovative technologies in the educational space is being updated. Currently, graduates who have the opportunity to work with digital technologies are needed. One of the priority tasks of the educational establishment is not only the acquisition of theoretical knowledge by the student, but also the development of the ability to use information technologies, independently extract and analyze information.

Digital educational technologies are an innovative way of organizing education using electronic systems that provide visibility. The purpose of using digital technologies is to improve the quality and efficiency of the educational process, as well as the successful socialization of students.

The use of digital technologies in recent years has been widely covered in scientific articles and research. The problem of digital technologies in the educational space was dealt with by such scientists and teachers as M. I. Makseenko, L. V. Shmelkova, E. L. Vartanova, S. S. Smirnov, A. Marei, L. V. Orlova, A. Yu.Uvarov and others (as cited in Nikonova et al., 2019). According to A. Yu. Uvarov (as cited in Nikonova et al., 2019), the use of digital technologies should be carried out in conjunction with the “synergetic updating of the content” of education. This approach will dramatically improve the quality of education.

According to L. V. Shmelkova (as cited in Nikonova et al., 2019), one of the priority qualities of a person adequate to the digital space is the possession of digital technologies and the ability to use them in

https://doi.org/ 10.15405/epsbs.2021.09.02.120
Corresponding Author: I. P. Uimanova
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

professional activities. S. S. Smirnov, E. L. Vartanova and M. I. Makseenko consider digitalization as a managerial, cultural, behavioral and infrastructural component of the educational process (as cited in Vartanova et al., 2017).

Among the reasons for the development of digital technologies in the educational process, many researchers distinguish an increase in independent work and a decrease in the classroom load. Therefore, in order to preserve and improve the quality of education, digital educational technologies are being actively introduced, providing interaction between the teacher and the student for timely elimination of gaps in knowledge. Among the possibilities of digital technologies in the preparation of students, they note:

- increase the mobility of completing tasks and studying materials;
- increase the motivation of students;
- individualization of the learning process;
- increase the visibility of materials;
- implementation of operational feedback with the teacher;
- providing students with instant access to the results immediately after completing the task.

Digital technologies are an integral part of society, therefore, the researchers note, they are easily integrated into the educational process, since students are used to using various electronic means in their lives, and this makes it easier for them to work with various electronic means and provides easier perception of information and educational materials.

Digital technologies make it possible to make the learning process differentiated, to build it in accordance with the needs of each individual student, to give tasks that correspond to the level of training and thereby improve the quality of learning (Fonarev & Fonareva, 2015). The use of digital tools helps to create conditions in which a student becomes an active subject of the educational sphere. From passive perception, he moves to active actions and participates in the performance of tasks.

3. Research Questions

The following questions were raised during the study:

- What role do digital educational technologies play in the educational space?
- What are the main types of digital educational technologies and how are they used in education?

4. Purpose of the Study

It is assumed that the answers to the above questions will help to achieve the purpose and will contribute to the disclosure of the possibilities of digital educational technologies in the training of highly qualified specialists.

https://doi.org/ 10.15405/epsbs.2021.09.02.120
Corresponding Author: I. P. Uimanova
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

5. Research Methods

Authors used the universal scientific research methods as well as methods for comparative and statistical analysis.

5.1. The main types of digital technologies

Among the main types of digital technologies are the following: mobile learning, cloud technology, online courses, and web quest. Now the technology of mobile learning is most in demand in the field of education. Thanks to its use, there is an opportunity for the most convenient and productive collaboration, knowledge exchange. Subjects of the educational process can exchange material remotely, transfer mobile devices within the student group, using wireless networks, infrared functions of a handheld personal computer.

Cloud technologies have convenient network access, allow you to store a large amount of information and allow you to use it with minimal management effort, i.e. the cloud allows you to distribute, process and store data.

So, thanks to this technology, teachers and students can carry out group, team activities remotely. For example, you can create home group research projects, reports, and presentations, where each student is responsible for their own section of the study work, but can edit and change other blocks. Changes made by each of their students will be synchronized in the shared document. Cloud technology can be applied based on distance learning. For example, a teacher in the electronic system of a university can post assignments, practical works and other written tasks, where the student's task is reduced to performing exercises in a document created by the teacher. These can be tasks of the following type: fill in a table or gaps in the text, answer questions or continue a thought. As the work is completed, the teacher checks the tasks, since he has access to the document (Gushchina et al., 2020).

The next digital educational technology is online courses, which are provided to students for use remotely. A distinctive feature and advantage of this technology is the personality-oriented orientation. Training is carried out at any time convenient for the student, which allows you to get qualified training in various areas in the most convenient form for the student.

Online learning can be implemented in two forms, such as synchronous and asynchronous learning. Synchronous training means that the teacher and the student are engaged at a specific time, while asynchronous training means that the student is taught at any convenient time period, i.e. the teacher develops the course and puts it on the Internet platform, and students get acquainted with the material provided and complete tasks. The advantage of this technology is that students, based on their individual abilities, can give the study of the material as much time as they need to understand and remember, and at any time can return to the past material to repeat the topic.

The peculiarity of web quests is that some or all of the information provided on the site for independent or group work of students is actually located on different sites. Web quests have a number of advantages, including: motivation of students to study new material; organization of work in the form of focused research, unlimited time; activation of independent individual or group activities of students.

https://doi.org/ 10.15405/epsbs.2021.09.02.120
Corresponding Author: I. P. Uimanova
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

Thus, this technology is based on inclusive learning, where each subject of the educational process has the opportunity to use personal technical means, such as a tablet, computer, laptop, smartphone. All digital technologies in the educational space perform a number of functions, the main of which are educational, managerial and communicative.

Educational involves the organization of e-learning through the identification, development, analysis, translation of educational practices, remote professional development of students and teachers.

The management function includes the accounting of academic performance, the preparation of ratings, charts, tables, as well as the development of electronic materials and evaluation tools (Bond et al., 2018). The communicative function is characterized by the network interaction of the subjects of the educational space, conducting online courses, webinars, various video conferences, broadcasts, etc.

6. Findings

Training with the help of distance educational technologies, in our opinion, has a number of advantages:

- the availability of educational material, and the presentation of it in an interesting form;
- building a distance learning course taking into account the individual characteristics of each student;
- the ability to re-access the training material and quickly search for the necessary information;
- availability of feedback (emails and messages to the author, forum, chat);
- development of universal learning activities through the use of distance learning technologies;
- the possibility of remote control of the quality of training.

The stated tendency of digitalization of education in the Russian Federation sets certain tasks for educational institutions (Karpova & Siyutkin, 2016). New solutions allow to individualize the educational process, adapting the program for each student. First, there is a digital divide between the providing of modern information gadgets to students and traditional educational approaches. Consequently, digitalization has both supporters and opponents. In our opinion, digital technologies should only complement, but in no way displace traditional methods in teaching. At the same time, students with disabilities and students with special needs could use their full potential. Optimal results can be achieved if digital technologies are used regularly, about three to four times a week, since their constant use can eventually reduce the efficiency of information processing by students (Vishnevskaya, 2008).

To collect the research data, we sent out an online questionnaire with questions to undergraduate and graduate students. The data collection was carried out in the period from the end of December 2020 to the beginning of January 2021 and was accepted by 111 respondents. Of the 121 respondents, 80 are undergraduate students, and only 41 are studying for a master's degree. Most of the students (52) are from the Department of “Chemical and Technological Processes”, some are trained in the direction of “Electric Power and Electrical Engineering” (44), and the rest of them represent a number of other fields of study.

https://doi.org/ 10.15405/epsbs.2021.09.02.120
Corresponding Author: I. P. Uimanova
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

The results obtained, the size of the research sample and the length of the questionnaire make our small study a useful starting point for further analysis, which we intend to conduct at our university in the spring of 2021.

At the end of the academic year, a survey was carried out between students on two aspects of digitalization of learning: the ease of using digital technologies and the effectiveness of the learning process after using digital technologies in comparison with traditional teaching methods. More than half of the respondents expressed the opinion that the use of digital technologies in the educational process did not cause difficulties and, if properly organized, was effective (see Figure 1). All figures and tables should be referred in the text and numbered in the order in which they are mentioned.

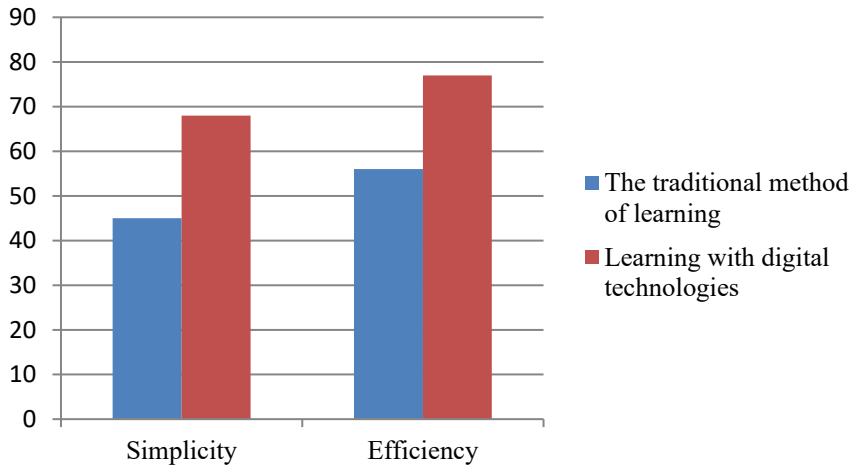

Figure 1. Aspects of digitalization of the learning process

7. Conclusion

The increasing use of digital technologies has led to changes in teaching and learning at all levels of the higher education system. Classroom and online learning methods work in parallel and act as a support system for each other. The use of digital technologies in education not only improves classroom learning, but also provides an opportunity for online learning.

The results of our research show that the use of digital educational resources opens up new opportunities in the methodology of teaching humanities. At the same time, it is important for the teacher to understand that the electronic resource should be actively mastered and used in the educational process in a dosed manner: depending on the needs of the participants in the educational process. It should be remembered about the power of words and the influence of live communication on the development of a person's personality.

The advantages of digital technologies in the educational space are the individualization of the educational process, the personality-oriented orientation.

Thus, a new level of education is emerging, where the priority is not only meeting the requirements of the program, but also taking into account the individual abilities of students. The use of digital

educational technologies expands the horizons of students, opens up new opportunities for obtaining knowledge in the most structured and understandable form.

Among the advantages, we can also highlight the minimization of paperwork, simplification of teaching activities and student training. Students develop practical skills. The use of digital technologies allows education to reach a qualitatively new level, characterized by the availability of knowledge.

References

Bilalova, D. N., Kireeva, N. A., Levina, T. M., Zharinov, Y. A., & Uimanova, I. P. (2020, May). Digital educational resources in the study of humanities subjects in a technical university. In *Advances in Social Science, Education and Humanities Research. Proceedings of the International Scientific Conference" Digitalization of Education: History, Trends and Prospects"(DETP* (No. 2020, p. 315).

Bond, M., Marín, V. I., Dolch, C., Bedenlier, S., & Zawacki-Richter, O. (2018). Digital transformation in German higher education: student and teacher perceptions and usage of digital media. *International Journal of Educational Technology in Higher Education*, *15*(1), 1-20. https://doi.org/10.1186/s41239-018-0130-1

Fonarev, D. V., & Fonareva, E. A. (2015). Psychophysical studies of individual differences in schoolchildren. *Bulletin of the South Ural State University. Series: Education, health, physical culture*, *15*(2), 11-15.

Gushchina, O. M., Ujmanova, I. P., Zatsarinnaya, E. I., Shichiyakh, R. A., & Solovyeva, N. M. (2020). Structural model of learning success formation among first-year students in the process of studying informatics. *Universidad y Sociedad, 12*(2), 325-329.

Karpova, O. L., & Siyutkin, A. G. (2016). Content characteristics of information competence as a factor of professional self-determination of a Bachelor of Physical Culture. *Theory and practice of physical culture*, *5*, 27-29.

National project “Education”. (2020). *Website of the Ministry of Education of the Russian Federation.* https://edu.gov.ru/national-project (accessed: 18.11.2020).

Nikonova, N. P., Vaganova, O. I., Smirnova, Z. V., Bystrova, N. V., & Markova, S. M. (2019). Providing partnerships and promotion of additional educational services. *International Journal of Applied Exercise Physiology, 8*(2), 347.

Vartanova, E. L., Vyrkovsky, A. V., Makseenko, M. I., & Smirnov, S. S. (2017). *Industry of Russian media: digital future.* Academic monograph.

Vishnevskaya, G. V. (2008). Technological approach in the pedagogical process of higher professional school. *Proceedings of the Penza State Pedagogical University named after V. G. Belinsky, 6*(10), 235-239.