

VI International Forum on Teacher Education

The Question of Students' Preparedness for Studying in the Digital Educational Environment

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Abstract

The relevance of the problem is due to the need for developing modern students' competencies related to the ability to develop in digital educational environment as well as use the Internet and digital services effectively. Digital literacy development will enable secure communication within the digital environment in a new social format. Digital literacy is related to a person's ability to create and use content with the help of digital technologies while searching for the information and sharing it while communicating with other people.

The purpose of the article is to study the level of modern students' preparedness for studying in digital educational environment. This phenomenon involves changes not only in the qualification requirements for the teaching staff, but also in the value-and-semantic sphere of the educational process subjects, their attitudes towards what is happening, the development of students' awareness and preparedness for using digital educational technologies during the process of mastering the profession.

The article deals with the components of modern students' readiness to study in a digital educational environment, as well as their levels of development. As a result, it was found that there is some discrepancy between the requirements of the Higher education system in the framework of educational environment digitalization and the students' preparedness for using information resources in their most effective educational version.

The methodological basis was represented by the aspects of the competence-based approach and the ideas of environmental and personal-activity approaches.

The possibility to create a digital educational environment which able to make changes in the value-and-semantic sphere of the educational process subjects in a modern University as well as students' preparedness for acquiring new competencies that are in demand in the digital labor market, are revealed in the article.

The research materials provide important information in the field of modern digital education, digital culture and forming personal, cognitive and communication readiness for successful socialization in the information society.

Keywords: digitalization of education; digital culture; digital technologies; digital educational environment; students' personal, cognitive, and communication readiness.

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Published by Kazan federal university and peer-reviewed under responsibility of IFTE-2020 (VI International Forum on Teacher Education)

Introduction

The questions of developing the digital economy as a part of the global economic system are discussed quite clearly, but its formation is impossible without developing digital competencies among young people and adults, since it is digital literacy makes it possible to develop in the digital educational environment.

The "Modern digital educational environment in the Russian Federation" Priority Project, approved by the Presidium of the Presidential Council for Strategic Development and Priority Projects (Presidium of the Presidential Council for Strategic Development and Priority Projects, 2016) converts the educational environment to a digital format. "The modern world is increasingly becoming digital, which means that the education process must also be digital and correspond to the realities of the modern and future world. The digital world will make it possible to build an individual educational trajectory", said the Director of the Department of State Policy in Higher Education at the Ministry of Education and Science of the Russian Federation A. B. Sobolev at a press conference dedicated to the first results of the above-mentioned priority project in December 2017 in Moscow (Presidium of the Presidential Council for Strategic Development and Priority Projects, 2016).

During the meeting of the Presidium of the Presidential Council for Strategic Development and Priority Projects on December 13, 2017, Russian Prime Minister Dmitry Medvedev announced the launch of a new priority project - "Digital school" as part of the "Digital economy of the Russian Federation" program (Government of the Russian Federation, 2017).

Thus, the question of education digitalization becomes quite relevant in recent years. Since 2018, Moscow schools have been implementing the «MEHSH» («Moscow e-school») project, which is based on the experimental foresight project called «Childhood 2030», which has caused a lot of controversy among the public. In this regard, the question arises about forming new competencies for Higher education institutions students related to the expansion of opportunities concerning independent search for educational information, as well as new meanings and values associated with the integrating computer training programs with traditional learning means.

The digital educational environment, is understood as "set of information systems" enabling the subjects of the educational process to build an individual development trajectory, taking into account their personal, cognitive and communicative preparedness development.

Digitalization of education, on the one hand, increases students' opportunities in terms of self-organization, self-regulation and self-analysis concerning their own activities; on the other hand - requires changes in their cognitive activity.

As for the Russian Federation, the question is related to the broader problem of forming an information society, which includes the educational system as well. There is a question connected with finding the optimal digitalization model, particularly for the students, studying Humanities and in social-and-economic fields. In addition, the digitalization of education is inextricably linked to the problem of organizing a qualitatively new education process, provided both technologically and psychologically, requiring not only new teaching forms and methods, but also the students' readiness to interact in a digital format.

Purpose and objectives of the study

The aim of the study is to identify the initial level of the students' personal (value-semantic), cognitive, and communicative preparedness for studying in a digital educational environment.

Literature review

The processes of education digitalization are associated with higher requirements for the quality of higher education, affecting its traditions and pedagogical practice, psychological and pedagogical risks for the educational environment, as well as students' personal characteristics associated with their preparedness for working in the digitalized educational environment.

The issues of understanding digital literacy are discussed by Vinnitsa (2017).

The phenomenon of digitalization in scientific and philosophical contexts was considered by Kuzmina (2019).

Currently, psychological and pedagogic research identifies and justifies the definition of information and educational environment. "Interactive environments" from the point of view of the technology learning process were studied by Blom (2000), Buchanan (2020), Currie et al. (2003); approaches to the definition of "quality of education" were studied by Livingstone (2012).

Based on the realities of digital education, when talking about Humanitarian departments students' preparedness for using digital educational technologies, it is necessary to talk about the level of their personal (value-semantic) (Akutina, 2019; Begantsova, 2016), cognitive and communicative preparedness (Shchelina, 2017). Complex psychological-and-pedagogic conditions providing effective development of readiness among today's students to study in digital learning environment includes the following: forming the ability to set goals in the new environment, positive learning motivation and creative activity in this environment, improving students' knowledge concerning the possibilities and means of digital educational environment that is due to their skills of working with a large and variable amount of information, developing the ability to interact within a digital learning environment, taking into account individual peculiarities of each student in the new environment

Methodology

Competence approach aspects, as well as the ideas of environmental and personal-activity approaches in pedagogy and psychology.

Methods: theoretical (philosophical, social, psychological and pedagogical literature analysis; works devoted to the question of scientific materials and publications research; systematization, classification, comparative analysis); empirical (pedagogical observation, survey, questionnaire, ascertaining experiment); mathematical statistics of psychological and pedagogical research methods. A questionnaire aimed at identifying modern students' preparedness to study in a digital educational environment was developed; it included three blocks of statements reflecting the structural components of Humanitarian departments students' readiness to use digital educational technologies: personal (value-semantic); cognitive (knowledge-based) and communicative (related to the ability to interact).

Experimental base

The experimental base of the research was National Research Lobachevsky State University of Nizhni Novgorod (Arzamas branch).

Research stages

The study was conducted in three stages:

- at the first stage, a theoretical and methodological study of philosophical, pedagogic and psychological scientific literature, dissertations on the problem was conducted; the problem, purpose, subject, research methods were formulated; an experimental research plan was prepared;

- at the second stage, a study on the level of modern students' preparedness for studying in the digital educational environment was conducted;
- at the third stage, a static analysis of the experimental study results was carried out, conclusions formulated and prospects for scientific research outlined.

Results

The process of digitalization within the framework of the Russian education is inevitable. In this regard, an active position of the educational community is necessary for analyzing and developing new proposals in the context of digitalizing higher professional education. Digital technologies lead to changes in the value and semantic sphere of the personality of an educational process subject, who will have to be able to determine the educational trajectory independently and be motivated for personal and professional self-development. Thus, today the question is quite relevant, particularly concerning the students' readiness to use digital educational technologies, meaning the following: their ability to set goals in the digital educational environment (value-and-semantic component) (Akutina et al., 2019); forming necessary competencies (cognitive component); ability to interact within the digital educational environment (communicative component).

Table 1. Characteristics of the components of modern students' readiness to learn in the digital educational environment

Component	Characteristics
Personal (value-and-semantic)	<p>Ability for self-organization, self-regulation and self-analysis of their own activities within the digital educational environment and value attitude towards them.</p> <p>Ability to determine the educational trajectory independently; being motivated for personal and professional self-development</p> <p>Ability to show personal initiative and conscious independence</p>
Cognitive (knowledge- and competence-based)	Competence in various computer programs

	<p>Ability to create software content independently</p> <p>Ability to design your own software product</p> <p>Knowledge in information filtering and orientation methods in the information flow</p> <p>Desire to improve knowledge concerning the digital educational environment and skills to work in it</p>
Communication-based	<p>Ability to interact in a qualitatively new technologically and psychologically secured educational process (participation in video conferences, seminars)</p> <p>Competence in various communication opportunities in the digital educational environment</p> <p>Competence in using video communication means</p> <p>Ability to conduct business correspondence by e-mail in compliance with network etiquette.</p> <p>Skills connected with using social networks and blogs for education and self-education</p>

The personal (value-semantic) component of the structure of modern students' readiness to study in the digital educational environment includes the following: understanding and accepting the changes in the norms, goals and rules of learning, including distance learning. This is due to the students' awareness concerning the breadth of opportunities for obtaining scientific and educational information in a new format, which contributes to the development of skills in the digital educational environment. In this context, we are talking about the internal understanding and accepting the meaning of using the digital educational environment in the professional activities, as well as the educational process subjects' readiness to use information resources as a source of knowledge (concerning both students and teachers). In this regard, we are speaking about of the self-organization, self-regulation and self-analysis processes

concerning their own activities in the digital educational environment and value attitude towards them, as well as the ability to determine the educational trajectory independently and be motivated for personal and professional self-development.

Cognitive (knowledge- and competence-based) includes the competence in technologies and methods of obtaining, using, storing and processing information as well as filtering information and orientation in the information flow. All this implies an understanding of the role of the digital educational environment in modern society and, generally, understanding the significance of the problems of the digital economy and the general cultural knowledge about the digital information picture of the world. In particular, this implies not only competence in various computer programs, but also the ability create software content independently as well as the desire to improve knowledge concerning the digital educational environment and the ability to work in it which is related to the ability to structure, analyze, compare and summarize information.

The communicative component includes the ability to various ways, forms and means of establishing communication, the ability to interact in a qualitatively new technologically and psychologically secured educational process, as well as the ethics of communication in the digital educational space.

For assessing the modern Humanitarian students' ability to study in the digital educational environment, a diagnostic experiment was conducted in Lobachevsky State University of Nizhny Novgorod (Arzamas branch) using a questionnaire, the structure of which included three blocks of tasks (Akutina et al., 2017). The first block was aimed at identifying the level of personal (value-semantic) readiness; the second identified the level of cognitive (knowledge, competence) readiness, and the third one was devoted to the students' communicative readiness to study in a digital educational environment.

Ascertaining stage

In total, 190 students of Humanitarian departments were involved in the study.

The indicator of readiness for learning in the digital educational environment

Is in the range from 0 to 100% calculated by the $L_{Comp} = \Sigma / Max \cdot 100\%$ formula, where Σ is the sum of points gained in the test expressing the actual level of readiness to learn in the digital educational environment; *Max* means the maximum volume.

The characteristics of the components of modern students' readiness to learn in the digital educational environment are presented below.

Table 2. The initial level of goal-setting ability in a digital educational environment (value-and-semantic component)

Goal-setting ability level in the digital educational environment (value-semantic component)	<i>Pedagogy and Deviant Behavior Psychology</i> group(%)	<i>Performance Psychology</i> group (%)
High (> 0,7)	19	16
Medium (0,5+0,7)	25	31
Low (< 0,5)	56	53

When evaluating the personal (value-semantic) component, we identified how students evaluate their abilities concerning self-organization, self-regulation and self-analysis of their activities within the digital educational environment.

From the above data, it is clear that the level of goal-setting ability in the digital educational environment (value-semantic component) is defined as low for most students.

Table 3. The initial level of goal-setting ability in a digital educational environment (cognitive component)

Goal-setting ability level in the digital educational environment (cognitive component)	<i>Pedagogy and Deviant Behavior Psychology</i> group(%)	<i>Performance Psychology</i> group (%)
High (> 0,7)	19	16
Medium (0,5+0,7)	42	44
Low (< 0,5)	39	40

When evaluating the cognitive (knowledge- and competence-based) component, the following aspects were identified: the students' level of proficiency in various computer programs, the ability to create software content and design their own software product independently, as well as the ability to filter information and orientation in the information flow. In this regard, it can be seen that the level of the necessary competencies development (the cognitive component) among most students is defined as average.

Table 4. The initial level of goal-setting ability in a digital educational environment (communicative component).

Goal-setting ability level in the digital educational environment (cognitive component)	<i>Pedagogy and Deviant Behavior Psychology</i> group(%)	<i>Performance Psychology</i> group (%)
High (> 0,7)	19	16
Medium (0,5+0,7)	42	44
Low (< 0,5)	39	40

When evaluating the communication component, we identified the students' experience of participating in video conferences, seminars, using various opportunities for organizing communication in the digital educational environment, etc. The above data show that the level of development of the necessary competencies among most students is defined as medium.

The percentage distribution of students by initial level of readiness to study in the digital educational environment is shown in Figure 1.

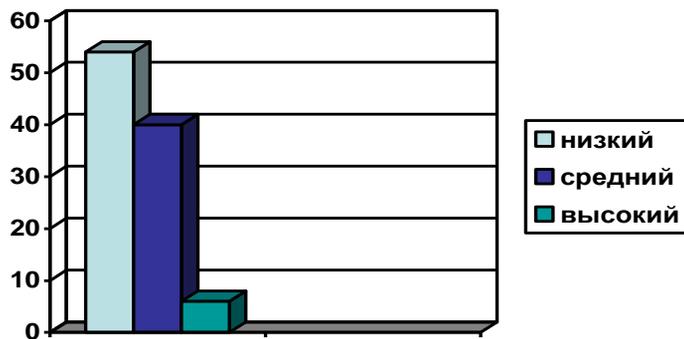


Figure 1. Students percentage distribution according to the level of readiness to study in the digital educational environment

In general, the analysis of the diagnostic study results show that among students, there are mainly primary (58%) and medium (40%) levels of preparedness for learning in the digital educational environment, while only 6% of students have a sufficient level.

Discussions

It is also proved that nowadays there is some discrepancy between the requirements of the Higher education system in the framework of digitalizing the educational environment and the students' readiness for a complete use concerning information resource in its most effective educational version. The average level of modern students' readiness to study in the digital educational environment is revealed, making it possible to conclude that it is necessary to make better and effective use of educational technologies in the process of mastering the profession, preparing for work in the information society, and making changes in the qualification requirements for the teaching staff concerning implementing the educational process using digital technologies.

Conclusion

As a result of the research, it was revealed that the digital educational environment makes it possible to build an individual trajectory of students' development, taking into account the development of their personal (value-semantic), cognitive and communicative readiness. Preparedness for living in an information society makes it possible to analyze personal activities, gain self-organization and self-regulation skills within the digital educational environment, as well as the ability to determine their educational and life trajectory independently.

The practical significance of the study is that the main provisions and conclusions of the article can be used in research and teaching practice when considering the issues of modern students' readiness to learn in a digital educational environment.

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