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## Formation of the digital culture of students at the university (from work experience)

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**Abstract.** *The article examines the individual components of the digital culture of a teacher and future specialists. Definitions of the concepts of the digital culture of a teacher, information culture, digital competencies, and digital literacy are given. A survey of students was conducted to obtain empirical data confirming the effectiveness of a theoretically sound pedagogical system for the formation of digital culture. The author argues that it is necessary to provide students with the opportunity to actively use the digital environment, including for organizing communication and for solving problems in educational and research activities. Data from work experience on the formation of digital culture of undergraduate students at a higher educational institution and the opinion of future specialists on digital culture are presented.*

**Keywords:** *digitalization, digital culture, pedagogical technology, digital literacy, questionnaire.*

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### Introduction

The modern education system and its development are influenced by transformations taking place in society. At the end of the XX and the beginning of the XXI century, as experience shows, the information environment is the dominant object in the structure of education. Today, a large number of professional tasks are solved using information technologies and require basic skills to work with them. The ability to quickly master new emerging technologies becomes a criterion for success in life.

When training specialists in the field of pedagogical education, the issues of the formation of the digital culture of future teachers become relevant. The issues of using digital culture are reflected in the materials of scientific conferences, and publications in professional-pedagogical

literature. And, of course, it becomes natural for modern society to use digital technologies.

Currently, digital technologies are beginning to be used as a means of communication and as a means of learning, while the pace of digitalization often outstrips the skills of users to master them. Future specialists at the university need to be taught not just the skills of working in a digital environment but also based on a value-based approach to form digital competencies, and the digital culture necessary for life in a digital society. Graduates of universities with a digital culture will be able to become competitively capable specialists.

When forming the digital culture of the future teacher at the university, the student must master the basics of the information worldview. It should become a cultural reference point for its students because digital culture contributes to the process

**Table 1**

Interrelation of the concepts of «digital literacy», «digital competencies», «Digital culture»

| The level of information training | The meaning of the concept                                                                                                                                                                                       |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Digital literacy                  | A basic set of knowledge and skills necessary for working with information and communication in a digital environment                                                                                            |
| Digital competencies              | Digital literacy is complemented by the ability and willingness to use critical assessment of information, means of communication, the ability to create digital resources, and comply with information security |
| Digital culture                   | Digital competencies are complemented by a worldview aspect, focused on the values of interaction in the digital environment, and new ethical principles.                                                        |

of cognition of reality as a whole and helps to synthesize the information received [1].

Information training of students is based on the concept of «information literacy», which is currently becoming the basis of the concept of «digital culture». This is because the economy and education are shifting to a digital environment [2].

Table 1 shows the relationship between the concepts of «digital literacy», «digital competencies», and «digital culture».

Digital culture is, first, an understanding of modern information transfer technologies, their functions, and their proper use in work or everyday life. A similar definition characterizing the digital culture of the future teacher is given by Gnatyshina E.V. According to the definition of Doctor of Pedagogical Sciences Gnatyshina E.V. digital culture is a complex systemic quality of personality, manifested in the construction of an information picture of the world and the actualization of the value-semantic sphere in information activities, a set of knowledge, skills of independent search, selection and analysis of necessary information, skills and practical experience of its organization, transformation, preservation, and transfer [3].

Students' digital skills may vary depending on the field of future activity: education, economics, healthcare, etc. At the same time, digital culture should become the basic, integral quality of the future competitive specialist.

In the theory of vocational education, the issues of digital literacy and humanitarian culture are considered in the works of L.N. Rulienė, who argues that digital literacy is a key functional literacy that allows expressing information needs, creating new information products using digital devices, digital resources, digital technologies and willingness to participate in information and educational interaction.

According to the scientist, the teacher needs to combine digital literacy with a culture of influence and communication. This statement allows us to consider the digital culture of a teacher as a system of values of a modern specialist based on digital coding and manifested in technical systems and communication mechanisms; as a system of changes in human activity and its products related to the culture of the digital era; as a set of socio-psychological traits and personality traits, acceptance (or non-acceptance) the formation of stereotypes of behavior in a certain digital environment, the consolidation of certain habits of networking and working with information [4].

### The main part

Computers, smartphones, consumer electronics, and information systems have become an integral part of the work and life of modern man.

A modern child whose life relates to the use of mobile phones, computers, and smartphones leads to the fact that he knows how to use the Internet since childhood. A junior student

easily masters the technologies offered by the information world, compared to adults. Our life makes him constantly in touch. And this multitasking, on the one hand, contributes to the fact that the child can quickly switch his attention to different sources of information, and he can get involved in various activities in a short period. But on the other hand, multitasking becomes superficial for the perception of information, and concentration of attention when solving one specific task is problematic, information overload and information fatigue appear. In our opinion, the digital activity of a child is associated with such sublevels of digital culture as digital means of communication and information, digital culture in the field of education, and, to a lesser extent, artistic and legal digital cultypa [5].

To obtain empirical data confirming the effectiveness of a theoretically sound pedagogical system for the formation of the digital culture of undergraduate students, we conducted experimental work in the form of a questionnaire. The author's questionnaire compiled by R.A.Shaukhalova was used for this work [6].

The author's questionnaire by R.A.Shaukhalov for studying the possibilities of the digital educational environment for the formation of digital culture among undergraduate students University: K. Zhubanov Aktobe Regional University.

In total, 41 respondents of K. Zhubanov Aktobe Regional University took part in the study, educational program: 6B01301 Pedagogy and methods of primary education, year of study: 2.

Table 2

| № | Can you assess how significantly digitalization affects human life, the functioning of society, and the state?                                                                                                                     | % interviewee |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1 | the appeal to the digital environment and information and communication technologies facilitates the life of a particular person and is carried out mainly for information processing and entertainment                            | 17%           |
| 2 | the digital environment and information and communication technologies are most actively implemented in the field of production and distribution of goods and services, as a direction of scientific and technological development | 49%           |
| 3 | digitalization is an essential trend of social development, digital technologies are in demand in the industrial and social spheres, having a significant impact on the life of every person                                       | 34%           |

Table 3

| № | Is interaction with the digital environment a mandatory attribute of professional activity and a professional graphic characteristic of a person? | % interviewee |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1 | no, currently digitalization affects a limited range of high-tech professions                                                                     | 7%            |
| 2 | partly, the digital environment provides a small part of the employee's information operations                                                    | 24%           |
| 3 | yes, interaction with the digital environment is an attribute of most modern professions and is part of the professional functions performed      | 69%           |

Table 4

| № | Can the possession of digital literacy, digital competence, and digital culture be considered a significant competitive advantage for a professional?                             | % interviewee |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1 | no, for the training of the future specialist is more important characteristics such as professional knowledge and skills                                                         | 12%           |
| 2 | not quite, the presence of digital literacy is necessary for a good summary, but the employer is only interested in the engineering aspect of proficiency in digital technologies | 7%            |
| 3 | not quite, the presence of digital competence is taken into account in hiring, however, does not affect the development and career advancement                                    | 10%           |
| 4 | Yes, digital literacy, digital competence, and digital culture are «speaking» the characteristics that distinguish a professional in any sphere of professional activity          | 71%           |

Table 5

| № | Do you consider mastering digital literacy, digital competence, and digital culture as a means of personal and professional development?                    | % interviewee |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1 | no, digital technologies help to solve everyday and educational tasks, they need to be partially mastered to a minimum                                      | 2%            |
| 2 | partly, digital technologies offer separate solutions for training and mastering the means of professional activity                                         | 15%           |
| 3 | yes, digital technologies and the digital environment are the spheres of self-realization of the individual, which has great potential for self-development | 83%           |

Table 6

| № | Express your attitude to the possibility of studying and professionally-oriented digital technologies in the educational space of the university.                               | % interviewee |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1 | haven't thought about it: digital technology can be mastered later in the production process, in special courses if need be                                                     | 10%           |
| 2 | experience limited interest if it is sufficient to read the General information on the professionally-oriented digital technologies and their capabilities                      | 17%           |
| 3 | experiencing considerable interest: you need to be aware of the current trends of technological development, including in the field of vocational-oriented digital technologies | 73%           |

Table 7

| № | What forms of educational work implemented with the support of digital technologies would you prefer?                                                | % interviewee |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1 | preparation for lectures and seminars, the performance of educational tasks using digital means of information search and presentation               | 44%           |
| 2 | The distance learning, webinars                                                                                                                      | 24%           |
| 3 | implementation of joint Internet projects                                                                                                            | 10%           |
| 4 | development of material of increased complexity, special courses, professionally-oriented online webinars to support educational research activities | 12%           |
| 5 | implementation of extracurricular Internet projects                                                                                                  | 10%           |

Table 8

| № | What elements of the university's digital educational environment could contribute more to the interest in the digitalization of future professional activities and the development of digital culture? | % interviewee |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1 | information resources about the life of the university                                                                                                                                                  | 59%           |
| 2 | The educational resources and portals                                                                                                                                                                   | 12%           |
| 3 | available to the student accounting and monitoring systems of academic performance                                                                                                                      | 2%            |
| 4 | means of communication and interaction of participants in the educational process                                                                                                                       | 5%            |
| 5 | means of designing distance learning courses                                                                                                                                                            | 10%           |
| 6 | information portal about scientific and professionally-oriented social networks                                                                                                                         | 12%           |

Table 9

| № | Evaluate your own experience in the application of digital technologies in the educational process?                                                                                                                             | % interviewee |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1 | in general, I have digital literacy, but the use of digital technologies can be difficult, the development of new digital tools causes discomfort                                                                               | 29%           |
| 2 | I have digital literacy, and the use of digital technologies does not cause significant difficulties, this is a familiar process, and I can master new digital tools based on the samples provided                              | 41%           |
| 3 | Simply, the use of digital technologies greatly facilitates the educational process, and the independent development of new digital tools increases interest in studying program material and mastering digital competence      | 20%           |
| 4 | I have a good command of digital literacy and competence, I am ready to help in the development of digital competencies, and I can give recommendations for improvement or participate in the development of digital tools used | 10%           |

## Conclusion

Analyzing the results of the questionnaire, we draw the following conclusions:

- Students, as future specialists, are generally familiar with the digital environment and have faced the need to use digital technologies in the process of training and professional activity.

- They find it difficult to characterize essential knowledge and skills that may indicate the formation of digital culture.

- They are aware of the spheres and directions of digitalization of professional activity, but they tend to use information and communication technologies for processing and searching for information.

- use digital technologies to provide digital information processing operations.

- are ready to engage in active and creative interaction with digital elements of the educational environment of the university.

Therefore, it is worth raising students' awareness and interest in a professionally-oriented digital environment, including this information and methods of activity in the content of education. It is worth allowing students to actively use the digital environment, including for organizing communication to solve problems of educational and research activities. To expand their experience in creative understanding and application of elements of the digital environment of the university. This area of work can be implemented at the level of creating pedagogical conditions conducive to students acquiring knowledge, skills, and experience of interaction in the digital environment.

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### **ЖОО-да студенттердің цифрлық мәдениетін қалыптастыру (жұмыс тәжірибесінен)**

**Аңдатпа.** Мақалада педагог пен болашақ маманның цифрлық мәдениетінің жеке компоненттері қарастырылған. Педагогтың ақпараттық мәдениеті, цифрлық мәдениеті, цифрлық құзырет, цифрлық сауаттылық ұғымдарына анықтамалар берілген. Цифрлық мәдениетті қалыптастырудың теориялық негізделген педагогикалық жүйесінің тиімділігін растайтын эмпирикалық мәліметтерді алу үшін студенттерге сауалнама жүргізілді. Автор студенттерге цифрлық ортаны, соның ішінде қарым-қатынасты ұйымдастыру және оқу мен ғылыми-зерттеу қызметінің міндеттерін шешу үшін белсенді пайдалану мүмкіндігін беру қажеттігін алға тартады. Жоғары оқу орнындағы бакалавриат студенттерінің цифрлық мәдениетін қалыптастыру бойынша жұмыс тәжірибесінен алынған мәліметтер және болашақ мамандардың цифрлық мәдениет туралы пікірлері келтірілген.

**Түйін сөздер:** цифрландыру, цифрлық мәдениет, педагогикалық технология, цифрлық сауаттылық, сауалнама.

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### **Формирование цифровой культуры студентов в вузе (из опыта работы)**

**Аннотация.** В статье рассмотрены отдельные компоненты цифровой культуры педагога и будущего специалиста. Даны определения таким понятиям, как цифровая культура педагога, информационная культура, цифровые компетенции, цифровая грамотность. Проведено анкетирование студентов с целью получения эмпирических данных, подтверждающих эффективность теоретически обоснованной педагогической системы формирования цифровой культуры. Автор утверждает, что необходимо предоставить студентам возможность активно использовать цифровую среду, в том числе для организации общения и для решения задач учебной и научно-исследовательской деятельности. Приведены данные из опыта работы о формировании цифровой культуры студентов бакалавриата в высшем учебном заведении и мнения будущих специалистов о цифровой культуре.

**Ключевые слова:** цифровизация, цифровая культура, педагогическая технология, цифровая грамотность, анкетирование.

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