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Cyberpedagogy – the educational challenge of the 21st century

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Abstract. With the rapid development of digital technologies, education is faced with the need to integrate modern digital tools into the learning process, which makes cyberpedagogy a prominent area of research. The purpose of the present study was to identify the effects of digital educational technologies on student engagement and academic performance, and to analyse the effectiveness of the Kahoot platform in the learning process. To fulfil this purpose, the study employed the methods of theoretical analysis of scientific literature, empirical research with questionnaire survey of students, as well as comparative analysis of control and experimental groups. The study assessed students' digital competences before and after training in the use of the Kahoot platform. The study found that pre-training in digital tools positively influenced the level of mastery: in the experimental group, the number of students confidently using the platform increased by 46%, while in the control group the changes were minimal. The analysis revealed that digital educational tools helped to increase the engagement and interactivity of the learning process and improved the perception of learning material. It was found that the use of interactive platforms contributed to the development of students' independence, stimulated their cognitive activity, and helped to form critical thinking skills. The key competences of a teacher necessary for the effective use of digital technologies in educational activities were identified, including technological literacy, adaptability, and the ability to integrate digital teaching methods. The practical value of the study lies in the possibility of using its findings by university and college teachers to optimise the educational process, as well as in the development of methodological recommendations for the implementation of digital educational tools in teaching practice, which will make learning more accessible, interactive, and effective

Keywords: digitalisation of education; teacher's role; hybrid learning; critical thinking; educational technologies; innovations in learning

■ INTRODUCTION

In recent decades, technology has developed at an incredible pace, and digital devices and the internet have become an integral part of everyday life, making education a major challenge. Contemporary learners have instant access to a vast array of information, which changes not only the ways of acquiring knowledge, but also the very role of the educator. V. Akhrenov *et al.* (2020) noted that “the lack of communication between students and teachers contributes to the loss of the emotional component of the educational

process”. Researchers noted that the digital transformation of education is accompanied by both positive changes and major challenges (Selwyn, 2021; Bond *et al.*, 2021). The digital revolution revealed problems such as outdated teaching methods, low levels of digital literacy among educators, lack of necessary technical resources in a series of educational institutions, and the absence of a unified strategy for the introduction of digital technologies into the educational process. Other studies also highlighted the

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risks of alienation and decreased student motivation in the transition to digital learning formats (Dai *et al.*, 2021). Students who are used to interactive and dynamic formats of the digital world may lose interest in conventional forms of learning. At the same time, A. Redecker & Y. Punie (2017) showed that digital technologies can not only increase student engagement but also improve the personalisation of learning. As a result, an imbalance can be observed: on the one hand, there are rapidly developing digital tools that can make learning more engaging and effective, while on the other hand, there is an education system that is not always ready for these changes. Educators are faced with the challenge of not only mastering the latest technologies, but also reorganising their usual ways of working, which requires time, resources, and effort.

Cyberpedagogy is one of the promising areas in pedagogical science, aimed at using digital technologies, online platforms, virtual and augmented reality, as well as artificial intelligence in the educational process. G. Vorobiev (1986) noted that “the aspect of cyberpedagogy is the informational nature of the learning environment”, but modern research emphasises the development of interactive technologies and adaptive learning systems (Redecker & Punie, 2017). Most importantly, however, cyberpedagogy proposes to rethink the very role of the educator from a source of knowledge to a facilitator and moderator who helps students effectively use digital resources for learning. It is a section of pedagogy that outlines the methodology of automatic programme management of computer-assisted learning in contrast to conventional pedagogy that considers the methodology of intuitive guidance of learning by the teacher “manually” (Bespalko, 2017).

The significance and relevance of this subject are conditioned by the fact that in the 21st century education can no longer exist outside the digital space. The COVID-19 pandemic clearly showed how critical the readiness of educational institutions to transition to the online format is (Agranovich & Drenyova, 2020). Educational institutions faced difficulties due to the lack of relevant competences among educators. Even after several years, the problem continues to be acute: not all educational programmes are adapted to the digital environment, and educators lack support and teaching materials (Radina & Balakina, 2021).

Cyberpedagogy is becoming not just a trend, but a necessity. It allows not only modernising the educational process but also preparing students to live and work in a digital society. S. Belov & I. Belova (2020) noted that “information and media literacy of school and university students makes provision for their effective interaction with media and information services, assumes the ability to work with any sources of information, as well as with all types and kinds of information, is expressed in knowledge, skills, and abilities that enable pupils and students to become active participants in the socialising Internet environment of cyberspace”. However, its implementation requires a systematic approach, including the training of teachers, technical equipment of educational institutions,

and the development of modern teaching methods. The solution of these problems is becoming a priority for educational systems around the world, which determined the relevance of the study of cyberpedagogy as an educational challenge of the 21st century.

In addition, the introduction of cyberpedagogy in Kyrgyzstan is accompanied by a series of major problems and challenges. Kyrgyzstan is far behind developed countries in the field of digitalisation of education. Many educational institutions lack the necessary technological infrastructure, including access to high-speed internet, modern computers, and software. Even more acute is the shortage of qualified teachers who are ready to apply cyber-pedagogical methods. The system of teacher training and retraining in this area is only beginning to develop, which hinders the full-fledged introduction of digital technologies into the educational process. In the context of the transition from the industrial to the information age, the ability of a person to effectively apply digital technologies to solve various tasks is of particular significance. The purpose of this study was to analyse the effects of cyberpedagogy on the educational process, to assess the effectiveness of digital tools in student learning, and to identify opportunities for increasing engagement and building digital skills using the Kahoot platform.

■ MATERIALS AND METHODS

This study employed a methodological approach combining theoretical and empirical methods to analyse the role of cyberpedagogy in modern education. The study aimed to investigate the effectiveness of digital tools such as the Kahoot platform in the educational process. The study reviewed academic literature including books, articles, and studies on cyberpedagogy, digital educational tools, and pedagogical competences using the theoretical analysis method. This provided a theoretical framework for the study and identified key trends in digital learning. The method enabled the identification of key trends in digital education, which is particularly significant in the context of rapid technological development and its effects on the educational process.

The study used practical experience of working with college and university students, which allowed observing the process of mastering digital tools in real learning environments. It was based on the idea that cyberspace influences students' perception of reality, as argued by J. Suler (2016). Practical application of digital tools in the educational process provided an opportunity to assess not only the level of knowledge, but also the degree of students' engagement in learning through technology.

A questionnaire – survey study was conducted among the students of the Kyrgyz National University named after J. Balasagyn and Teachers College to assess their knowledge and skills in using the Kahoot platform before and after the training. The questionnaire survey helped to record the dynamics of changes in students' knowledge and skills before and after the training. The study included two

groups: control group (SG-1, 17 students) – students with no prior training on the Kahoot platform; experimental group (SG-2, 19 students) – students with prior training on the use of Kahoot before testing. After the questionnaires were administered, quantitative data demonstrating changes in the students' knowledge and skills were obtained. All procedures were conducted following the American Sociological Association's Code of Ethics (2018).

The study was conducted in several stages: preparatory stage – analysis of the relevance of the topic and selection of scientific sources on cyberpedagogy and digital educational technologies; data collection – review of scientific publications, educational platforms, and existing research; training of the experimental group – SG-2 students received preliminary instruction and practical training on the use of Kahoot; questionnaire – testing of students of SG-1 and SG-2 before and after the experiment; data analysis – processing of the results of the questionnaire, assessment of changes in the level of knowledge and skills of students. The use of a mixed approach helped to obtain both theoretical findings and empirical data, providing a comprehensive understanding of the role of digital tools in modern pedagogy and assessing their effects on the formation of pedagogical competences.

■ RESULTS AND DISCUSSION

Theoretical foundations of cyberpedagogy and its impact on education

According to V. Bepalko (2016), cyberpedagogical learning technology starts with a clear understanding and formulation of what result society expects from the educational process – whether it is learning within the entire educational institution or a concrete course. The theory of cyberpedagogical learning technology defines in advance what criteria and indicators can be used to assess how well a student is prepared for their future professional activity. As a result, society's demand for educational outcomes can be expressed very succinctly, but in a way that is clear and precise for the professionals who design educational programmes. Thus, cyberpedagogical teaching technology allows creating educational programmes that meet the requirements of modern society to the maximum extent possible and guarantee quality training of students. This is the key feature of cyber-pedagogical teaching technology – orientation towards the concrete demands of society and clear criteria for assessing the quality of students' training. The educational process begins with an understanding of what knowledge and skills society needs. With predetermined assessment criteria, learning becomes more transparent and efficient. This approach ensures the creation of curricula that not only meet modern requirements but also help to create competent professionals ready for real professional tasks.

Digital learning can be so effective that students can immerse themselves deeper into the educational process, perceiving virtual tasks, simulations, and online interactions as a full part of their reality. According to psychologist J. Suler (2016), “cyberspace is one way of altering the

state of consciousness. As in an altered state of consciousness in general, cyberspace and everything that happens in it seems real – often even more real than reality itself”. Cyberpedagogy takes advantage of this property of cyberspace by creating conditions where educational materials become not just information, but a “lived experience”. This promotes better learning, critical thinking, and the development of new skills. By engaging and experiencing the reality of the digital environment, learning becomes more interesting and meaningful for today's learners who are used to constant interaction with technology. Cyberpedagogy is an innovative direction of pedagogy, which is based on scientific principles and aims at systematic organisation and purposeful activity in the field of cybereducation, cyberlearning and cybereducation. It aims at building the necessary skills and competences in cyberspace in modern human beings, using information and communication, computer and digital technologies as the main tools for cybersocialisation (Suler, 2016).

The opinion about the professional suitability of a teacher and its significance in the development of pedagogical professionalism belongs to the pedagogue T. Bechturov (2019). His papers emphasise that professional suitability is not limited only to knowledge but also includes significant values that guide the educator in their professional activities. T. Bechturov (2019) emphasised that professional suitability is the basis for pedagogical excellence, which is the result of personal growth and life experience of a teacher. Professional suitability of a teacher in the context of cyberpedagogy acquires special significance, since a modern teacher should not only possess conventional pedagogical knowledge, but also actively master the latest digital technologies. At this time, cyberpedagogy requires the teacher to develop not only professional knowledge, but also digital literacy, the ability to work with information and communication technologies, and the ability to integrate these technologies into educational activities.

The term “cybersocialisation” was introduced by V. Pleshakov (2011) and describes the process of changing the structure of the individual's self-consciousness and its needs-motivational sphere under the influence of modern information technologies. Cybersocialisation has substantially affected the development of cyberpedagogy, as it became the basis for understanding how technologies affect the development of the individual and their socialisation in the digital space (Pleshakov *et al.*, 2021). Initially, cyberpedagogy focused on the use of technology to improve the learning process, introducing computer and internet resources into the educational process. The use of the latest technologies in teaching was experimental rather than systematic, which led to the need to create a theoretical basis for the introduction of technologies into pedagogical practice. At first, only basic computer technologies such as projectors and simple learning programmes were used in educational institutions. However, with the development of the internet and software, there was a need for more in-depth research into the role of digital technologies in

teaching and learning. From this point, the first theoretical works on cyberpedagogy began to appear, which emphasised the significance of incorporating technology into the pedagogical process and its influence on teaching methods.

By the late 2000s, with the massive proliferation of the internet, social media, and online platforms, cyberpedagogy had greatly evolved. Educators began to recognise the value of building students' IT skills and the need to introduce innovative learning formats such as distance and online learning. As a result, learning has become more flexible, personalised, and accessible to the wider public. The information revolution has had a tremendous impact on the educational sphere, radically changing approaches to learning. With the development of the internet, mobile devices and cloud technologies, many new opportunities have emerged to improve the effectiveness of the learning process. Educational institutions began to use e-textbooks, online courses, distance learning platforms, and other tools that have greatly expanded the accessibility of education.

Many educators and researchers are actively engaged in the development of cyberpedagogy, exploring its key aspects and specific challenges. There is a growing number of studies in various universities and research institutions that cover a wide range of issues related to the use of digital technologies in education. These include topics such as the accessibility and quality of distance education, stressors associated with distance learning, and the effectiveness of pedagogies and technologies in digitalisation. Particular attention has been paid to issues such as identity verification in online examinations and maintaining academic integrity in virtual educational environments (Dobrovinsky *et al.*, 2018; Shtykhno *et al.*, 2020). These studies help to better understand how to use digital technologies to improve the quality of education and overcome the challenges faced by educators and students in online learning environments. S. Kolovorotny (2003), considering the characteristics of the virtual reality system, notes its ability to change information flows, combine them and generate new ones. According to his opinion, virtual reality, due to its ability to simulate various situations, can be an effective tool for the acquisition and consolidation of practical skills, including the ability to interact in society and successful socialisation.

The primary impact of the information revolution is that learning has become more accessible, flexible, and personalised. The use of technology allows educators to create interactive, engaging, and multimedia educational materials that enhance learning. The interactivity and accessibility of learning resources allows students to study at their convenience, which is crucial for people with disabilities or those who, for various reasons, cannot attend conventional educational institutions. According to the U.S. Department of Education (2010) report, "Evaluating Evidence-Based Online Learning Practices: A Meta-Analysis and Review of Research", students who learned content in an online format performed slightly better than those who learned in a traditional face-to-face setting". This finding suggests that online learning can be just as effective, and in

some cases even more effective, than conventional forms of learning. This emphasises the significance of digital learning technologies and their potential to improve students' academic achievement by giving them flexibility, access to a variety of resources, and the opportunity to learn at their individual pace.

What appeals to and inspires contemporary young people may be vastly different from what was familiar to previous generations. It is vital to recognise that each generation seeks to pursue what is meaningful, interesting, and relevant to them, finding their personal ways of fulfilment and expression in a changing world. In this context, the key challenge is to create conditions in which members of each generation can develop their abilities and pursue their interests using modern tools and approaches. Understanding and respecting these differences allows not only to build effective educational processes, but also to create an environment in which innovative ideas and initiatives are supported and developed.

As a result of the information revolution, a new concept of education has emerged that focuses on the use of technology as a tool for developing the competences required in the digital society. Cyberpedagogy is focused on developing students' skills in working with digital tools, as well as on teaching critical thinking and Internet safety, which corresponds to modern requirements and challenges of society. According to A. Stokov (2020), digital education has contradictory consequences. The widespread use of digital technologies leads to a weakening of society's intellectual culture. In researcher's opinion, when a "machine" begins to perform those functions that previously contributed to the development of human intelligence, it inhibits development and leads to the degradation of mental abilities. This opinion raises critical questions about the balance between technology and conventional educational methods. On the one hand, digital technologies open new opportunities: access to vast amounts of information, interactive learning, personalisation of the educational process. On the other hand, relying entirely on automated systems risks losing critical thinking and independent analysis skills.

However, this is not a matter of the technology itself, but of how it is used. The intelligent and informed introduction of digital tools can greatly enrich the educational experience, while over-reliance on 'machines' can actually be detrimental to intellectual development. The foremost task of the educator is to teach students how to maintain a balance so that technology serves as a supplement to human development, not a replacement for conventional teaching methods (Riznyk & Riznyk, 2024). In the context of cyberpedagogy, the formation of students' active subjective position becomes especially significant because online education requires students to be more self-regulated, proactive, and responsible. The development of such qualities as activity, commitment, responsibility, and autonomy allows students not only to effectively learn the educational material, but also to interact successfully in the virtual educational space. Therefore, it

is essential to develop students' active subjective position in educational and professional activities, as it contributes to the development of these very qualities (Kulagina & Apasova, 2018).

Despite numerous innovations and technological advances in education, such as the use of virtual reality, adaptive learning, and other digital technologies, it is vital to remember that human qualities, education, and care for the student will always remain the basis of successful learning. Ultimately, technological tools only create the conditions for more effective learning, but they cannot replace the genuine desire for learning that can only come from the educator. In cyberpedagogy, especially as teaching increasingly moves into the online space, it is key that the educator maintains their role as a mentor who not only transmits knowledge, but also keeps students motivated and creates an atmosphere of trust and confidence. Human beings, not technology, are the primary source of inspiration and support. A kind attitude towards students, attention to their personal motivation, tolerance for diversity of approaches and concern for everyone are invariable components of an effective educational process. It is educators who have an in-depth knowledge of their subject, who actively use technology tools, who can create space for students' creativity and autonomy, while maintaining a prominent level of human engagement. Thus, the use of technology should only be a complement to the core values of pedagogy, helping to create a space for personal growth and creative expression for students.

Practical application of cyberpedagogy: The role of digital tools and the educator in the educational process

Modern educational technologies successfully combine conventional teaching methods with digital tools to form an interactive and adaptive environment. Lectures and the explanatory-illustrative method are supplemented with electronic presentations, interactive models and videos, which improves the perception of information and makes learning more visual. The active introduction of digital technologies contributes to improving the quality and accessibility of education. Online platforms such as Google Classroom, Google Meet, Moodle, and Zoom allow for distance learning, course management, and live classes. Interactive whiteboards provide visualisation of learning materials and communication apps (WhatsApp, Telegram) facilitate the coordination of learning activities.

Digital tools have also transformed the knowledge assessment system. Automated tests on Kahoot, Quizizz, and AVN enable objective verification of learning progress, and discussions are moving beyond the classroom to digital forums and educational chats. Digital technologies are also widely used in project work: collaborative work is organised through Google Docs and Miro, enabling convenient and productive interactions. Digital technologies play an equally significant role in the administration of the educational process. Electronic diaries allow students and their parents to quickly receive information about their academic

progress, while university educational platforms (e.g., AVN) allow uploading academic work, interacting with teachers, and receiving prompt feedback. Thus, digital literacy is becoming an integral part of the educational process. Information competence includes the ability to seek, analyse, and use information using digital tools, which is vital to prepare students for the modern world. Within the competence approach embedded in the state educational standards, special attention is paid to the ability not only to work with information, but also to apply it to argue conclusions and make decisions.

The development of digital technologies changes not only the educational environment, but also the role of the teacher. In cyberpedagogy, the teacher ceases to be the only source of knowledge, becoming a facilitator who guides students in finding and critically analysing information. The role of the teacher in cyberpedagogy is particularly significant considering the rapid development of digital technologies and their introduction into the educational process. In the context of cyberpedagogy, there are a series of changes both in the requirements for the professional competence of teachers and in the structure of the educational process, which greatly affects the role of the teacher. On the one hand, there are new requirements to the professional competence of teachers, which can be attributed to the following:

- technological literacy, where educators must be capable of using a variety of digital platforms and resources to develop learning materials, deliver lessons, and assess results;

- cybersecurity, where it is vital to train educators in internet safety, data protection and the protection of students' personal information;

- flexibility and adaptability, where the educator must be ready to respond quickly to changes in educational technologies and innovations, be ready to introduce innovative approaches and methods.

On the other hand, changes in cyberpedagogy significantly affect the teacher's role and the structure of the learning process when:

- the use of digital technologies allows teachers to adapt the learning process to the needs of each student, creating individual learning trajectories while accommodating personal preferences and needs;

- the learning process becomes hybrid, combining conventional teaching methods with elements of distance and online learning.

Thus, the teacher in cyberpedagogy not only retains their role as a mentor, but also becomes an active participant in the innovative educational process, capable of working effectively in the digital environment. The pedagogue's information competence includes the skills of purposeful search for missing data, critical analysis and comparison of information, and formulation of hypotheses based on a comprehensive understanding of the obtained information. In the educational process, a key role in the development of these skills is played by the digital environment, including

electronic diaries and educational platforms (e.g., AVN in higher education institutions), which provide interactive interaction between students and teachers. To successfully implement the competency-based approach, a teacher should not only master modern methods of working with information but also create conditions conducive to the development of students' critical thinking, unassisted search for knowledge, and meaningful application of digital technologies in educational and professional activities.

An empirical study: The impact of Kahoot use on student engagement

Modern digital technologies are rapidly penetrating the educational process, which affects both teaching methods and the role of the educator. The educational environment is increasingly combining conventional teaching methods

with modern digital tools such as online platforms and interactive services. One such tool is the Kahoot platform, the use of which can increase student engagement and make the learning process more interactive. To assess the effectiveness of digital tools in the educational process, a questionnaire survey was conducted among the students at the Kyrgyz National University named after J. Balasagyn and the Pedagogical College. The purpose of the study was to assess the level of students' awareness of the Kahoot platform and the dynamics of their skills in using this tool after preliminary training. The study included two groups of students: the control group (SG-1, 17 students) – students did not receive prior training on Kahoot; the experimental group (DO-2, 19 students) – students received prior training on the use of Kahoot before testing. The results of the questionnaire are presented in Table 1.

Table 1. Results of students' questionnaires

No.	Platform Kahoot	KNU named after J. Balasagyn, Pedagogical College			
		SG-1 (control group)		SG-2 (experimental group)	
		<i>before</i>	<i>after</i>	<i>before</i>	<i>after</i>
1	<i>Do not know it</i>	4	3	13	0
2	<i>Know and can use it</i>	4	5	2	11
3	<i>Know but cannot use it</i>	9	9	4	8

Source: developed by the authors

The results of the questionnaire showed the following: among the students who did not know about Kahoot, in the control group (SG-1) their proportion decreased from 4 out of 17 (23.53%) to 3 out of 17 (17.65%), while in the experimental group (SG-2) – from 13 out of 19 (68.42%) to 0 out of 19 (0.00%). The percentage of students who were familiar with and knew how to use Kahoot increased from 4 out of 17 (23.53%) to 5 out of 17 (29.41%) in SG-1 and from 2 out of 19 (10.53%) to 11 out of 19 (57.89%) in SG-2. The number of students who knew about the platform but did not know how to use it stayed unchanged at 9 out of 17 (52.94%) in the control group, while it increased from 4 out of 19 (21.05%) to 8 out of 19 (42.11%) in the experimental group. These findings revealed that pre-training positively influenced the students' awareness and ability to use Kahoot. In the experimental group, the percentage of students who were not familiar with the platform decreased to 0% and the percentage of students confidently using Kahoot increased significantly. These results emphasised the significance of targeted training in digital tools. Simply integrating technology into the educational process is insufficient – training for both students and teachers is required.

The information competence of the teacher plays a key role in the successful mastering of digital technologies by students. Online platforms (Google Classroom, Zoom, Moodle), interactive whiteboards, cloud services, and mobile applications for communication are actively used in the educational process. However, the effective use of these tools requires a suitable level of teacher training, including technological literacy – the ability to use digital platforms and resources to develop learning materials, conduct lessons,

and assess knowledge; cybersecurity – knowledge of the principles of personal data protection and Internet security; flexibility, and adaptability – the willingness of teachers to learn the latest technologies and methods, adapting them to meet educational needs. Thus, the integration of digital technologies, such as Kahoot, requires not only the technical equipment of educational institutions, but also the suitable level of training of teachers and students. For the successful implementation of digital tools, it is vital to consider the specifics of each educational institution, as well as to develop methodological recommendations for their use.

CONCLUSIONS

The study analysed modern approaches to the integration of digital technologies into the educational process, their influence on teaching methods, the role of the teacher, and the quality of learning. Practical aspects of cyberpedagogy were considered, including the use of online platforms, interactive tools, and digital services to organise the learning process. An empirical study revealed that purposefully teaching students how to use digital tools such as Kahoot considerably increases their engagement and digital competence. The key finding was that the combination of conventional and digital teaching methods forms an adaptive, personalised, and interactive learning environment that promotes not only knowledge acquisition but also the development of key competencies required in the digital economy. However, effective implementation of cyberpedagogy requires rethinking not only teaching methods, but also the role of the teacher. The teacher no longer just imparts knowledge but becomes

a mentor and guide in the world of digital information, helping students to develop critical thinking, independence, and the ability to analyse data.

Therewith, the process of digitalisation of education presents a series of challenges. Many educational institutions face inadequate funding, which limits the ability to purchase modern equipment such as interactive whiteboards and AI-based programmes. Problems with technical support, cybersecurity, and methodological support also stay unresolved. Despite this, the development of cyberpedagogy is essential to ensure accessible and quality education in the future. Prospects for further research include developing methodological recommendations for the effective implementation of digital technologies in the educational process; studying the effects of digital tools on the development of critical thinking and independence of students; assessing the long-term effect of digitalisation on

educational outcomes and professional training of graduates; analysing the possibilities of using artificial intelligence in pedagogical practice and developing approaches to its integration into teaching. Thus, cyberpedagogy continues to be a key area of education modernisation, contributing not only to the improvement of educational results, but also to the development of digital literacy, which is in demand in modern society.

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Киберпедагогика – XXI кылымдагы билим берүү чакырыгы

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Аннотация. Санариптик технологиялардын тез өнүгүүсүнүн шартында билим берүүнүн заманбап санариптик инструменттерди окуу процессине интеграциялоо зарылдыгына туш болушу, илимий изилдөөлөр чөйрөсүндө Киберпедагогиканы маанилүү багытка айландырууда. Иштин негизги максаты санариптик билим берүү технологияларынын студенттердин активдүүлүгүнө жана академиялык жетишкендиктерине тийгизген таасирин аныктоо, ошондой эле билим берүү процессиндеги Kahoot платформасынын натыйжалуулугун талдоо болгон. Бул максатка жетүү үчүн илимий адабияттарды теориялык талдоо методдору, студенттердин сурамжылоолору менен эмпирикалык изилдөөлөр, контролдук жана эксперименталдык топтордун салыштырма анализи колдонулган. Изилдөө студенттердин санариптик компетенцияларын Kahoot платформасын колдонуу боюнча тренингте чейин жана андан кийин баалады. Санариптик инструменттер боюнча алдын ала окутуу алардын өнүгүү деңгээлине оң таасирин тийгизгени аныкталды: эксперименталдык топто платформаны ишенимдүү колдонгон студенттердин саны 46%га көбөйдү, ал эми контролдук топто өзгөрүүлөр минималдуу болгон. Талдоо санариптик билим берүү инструменттери окуу процессине катышуунун жана интерактивдүүлүктүн жогорулашына жана окуу материалын кабыл алууну жакшыртууга салым кошконун көрсөттү. Интерактивдүү аянтчаларды колдонуу окуучулардын өз алдынчалыгын өнүктүрүүгө өбөлгө түзүп, алардын таанып-билүү активдүүлүгүн стимулдап, критикалык ой жүгүртүү жөндөмдөрүн өнүктүрүүгө жардам берери аныкталды. Билим берүү ишмердигинде санариптик технологияларды эффективдүү колдонуу үчүн зарыл болгон мугалимдин негизги компетенциялары аныкталган, анын ичинде технологиялык сабаттуулук, жана санариптик окутуу ыкмаларын интеграциялоо жана ыңгайлаштыруу жөндөмдүүлүгү. Изилдөөнүн практикалык баалуулугу анын натыйжаларын ЖОЖдордун жана колледждердин окутуучулары тарабынан окуу процессин оптималдаштыруу үчүн колдонуу мүмкүндүгүндө, ошондой эле санариптик билим берүү инструменттерин окуу практикасына киргизүү боюнча методикалык сунуштарды иштеп чыгууда, бул окууну жеткиликтүү, интерактивдүү жана натыйжалуу кылат.

Негизги сөздөр: билим берүүнү санариптештирүү; педагогдун ролу; гибридик окутуу; критикалык ой жүгүртүү; билим берүү технологиялары; окутуудагы инновациялар

Киберпедагогика – образовательный вызов XXI века

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Аннотация. В условиях стремительного развития цифровых технологий образование сталкивается с необходимостью интеграции современных цифровых инструментов в учебный процесс, что делает киберпедагогiku важным направлением исследований. Основной целью работы было выявление влияния цифровых образовательных технологий на вовлеченность студентов и их академическую успеваемость, а также анализ эффективности платформы Kahoot в учебном процессе. Для достижения поставленной цели использованы методы теоретического анализа научной литературы, эмпирическое исследование с анкетированием студентов, а также сравнительный анализ контрольной и экспериментальной групп. В ходе исследования была проведена оценка цифровых компетенций студентов до и после обучения использованию платформы Kahoot. Установлено, что предварительное обучение цифровым инструментам положительно влияло на уровень их освоения: в экспериментальной группе число студентов, уверенно владеющих платформой, увеличилось на 46 %, тогда как в контрольной группе изменения были минимальными. Анализ показал, что цифровые образовательные инструменты способствовали повышению вовлеченности и интерактивности учебного процесса, а также улучшали восприятие учебного материала. Выявлено, что применение интерактивных платформ способствовало развитию самостоятельности студентов, стимулировало их познавательную активность и помогало сформировать навыки критического мышления. Определены ключевые компетенции педагога, необходимые для эффективного использования цифровых технологий в образовательной деятельности, включая технологическую грамотность, адаптивность и способность интегрировать цифровые методы обучения. Практическая ценность исследования заключается в возможности использования его результатов преподавателями вузов и колледжей для оптимизации образовательного процесса, а также в разработке методических рекомендаций по внедрению цифровых образовательных инструментов в преподавательскую практику, что позволит сделать обучение более доступным, интерактивным и результативным.

Ключевые слова: цифровизация образования; роль педагога; гибридное обучение; критическое мышление; образовательные технологии; инновации в обучении