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Scientific article

Development of cognitive independence of future teachers through the use of digital educational resources

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Abstract. This article is devoted to the study of the effectiveness of using digital educational resources for the development of cognitive independence of future teachers. The research involved students who actively used digital resources to study academic subjects, and the results were analyzed. The main objective of the study was to determine the extent to which the use of digital educational resources in the learning process contributes to the development of students' cognitive independence.

The analysis of the research results showed that the use of digital educational resources indeed contributes to the development of students' cognitive independence. Moreover, it was noted that digital educational resources have several advantages that make them particularly useful for learning. In particular, they are accessible to most students, which makes them convenient to use anytime and anywhere. In addition, they are characterized by interactivity and the possibility of individual customization of learning according to the student's level of knowledge and specific needs.

We conducted a study based on certain methods for assessing the level of independence ("Methodology for determining the strength of cognitive need" by V.S.Yurkevich, "Methodology for determining cognitive activity" by L. A. Chervyakova, Yu.V. Boyko) and comparing the results between a group of students using digital educational resources and a control group that studies without using them. A survey was conducted to identify students' attitudes towards digital educational resources and their own assessment of the level of independence in educational activities.

The article also discusses the possibilities of using digital educational resources in the learning process and provides recommendations for their application. The use of digital educational resources makes it possible to improve the quality of learning and the development of cognitive independence of future teachers. Thus, this study emphasizes the importance of integrating digital educational resources into education and offers specific recommendations for their effective implementation.

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Based on the results of the experimental work, it should be noted that when preparing a future teacher at a university in order to form and develop cognitive independence, it is necessary that the student has the opportunity to be involved in innovative activities for the development of new digital technologies.

Keywords: cognitive independence, development, future teachers, digital educational resources, self-learning, competencies

Introduction

In modern society, education can hardly be imagined without the use of advanced digital technologies. Digital educational resources represent a powerful tool for learning and for fostering the cognitive independence of future teachers. Cognitive independence is one of the most important aspects of personal development and includes the ability to work with information independently and effectively, to analyze it, to make decisions, and to solve problems. However, in order to develop cognitive independence, it is necessary to employ appropriate methods and tools.

Digital education is the basis of security in the information society, the most important education of the XXI century, one of our main topics. Digital literacy is the willingness and ability of a person to reliably, effectively apply digital technologies in all areas of their life. Using this technology opens the way to improving the quality of life of the population.

The defense of a professional includes the development of not only his qualifications and experience, but also his willingness to acquire new knowledge and apply it in practice. It is important to develop flexibility of thinking and actions, analytical abilities and the ability to make informed decisions.

Recent studies emphasize that digitalization in education is not merely a trend but a transformative force that reshapes pedagogical approaches and learning environments. According to Bagga & Agrati (2024), digital tools such as virtual reality, artificial intelligence, and online platforms are increasingly used to personalize learning and enhance student autonomy. These technologies allow learners to engage in self-directed exploration, which is essential for developing cognitive independence.

The use of digital educational resources makes it possible to significantly expand the opportunities of the educational process and ensure the accessibility of education for a wide range of learners. Today, digital technologies are an integral part of education in many countries around the world. At the same time, the use of digital educational resources requires appropriate qualifications on the part of teachers, as well as certain knowledge and skills on the part of students.

Moreover, adaptive learning systems and AI-assisted platforms have shown significant improvements in student engagement and academic achievement. For instance, personalized learning supported by AI can lead to a 0.42 standard deviation increase in mathematics performance (Citetur, 2023). These systems adjust content based on learners' progress, fostering deeper understanding and motivation.

One of the main advantages of using digital educational resources is the possibility of creating individualized learning pathways and programs for each student. Interactive textbooks, online courses, and other digital educational resources enable teachers and students to adapt the educational process to the individual needs and characteristics of each learner. As a result,

students can receive a higher-quality education, while teachers can work with their students more effectively and efficiently.

Gamification is another emerging trend that supports cognitive development. Studies show that game-based learning can boost student performance by up to 34% and increase motivation significantly. Educational games and simulations provide immersive experiences that encourage critical thinking and problem-solving.

An important aspect of using digital educational resources is their accessibility and wide variety. Modern digital technologies make it possible to create diverse educational materials, including texts, graphics, videos, audio, and other types of information. As a result, students can study materials in a convenient format and choose the educational resources that are most suitable for them.

However, the use of digital educational resources requires certain competencies on the part of both teachers and students. Teachers must possess not only technical skills in working with computers and the Internet but also the ability to adapt the educational process to the requirements of the digital environment. Students, in turn, must be prepared to work independently with information, be able to navigate large volumes of data, and analyze them.

In order to use digital educational resources effectively, it is also necessary to develop the cognitive independence of both teachers and students. Cognitive independence includes such qualities as the ability to independently search for information, analyze it, make decisions, and solve problems. The development of these skills enables teachers and students to work effectively with digital educational resources and use them to achieve better learning outcomes.

One of the ways to develop cognitive independence is through the use of interactive learning materials. Such materials allow students not only to acquire new knowledge but also to independently explore and analyze information. Interactive learning materials also enable teachers to design a variety of tasks and exercises that contribute to the development of students' cognitive independence.

Another way to foster cognitive independence is through the use of online courses. Online courses allow students to study different subjects and topics at their own pace, select the most suitable level of difficulty, and receive feedback from teachers. This also enables teachers to monitor each student's progress and adapt the educational process accordingly.

The use of modern digital technologies in education helps to create learning environments that are highly responsive to the needs of both students and teachers.

Another important aspect of using digital educational resources is their interactivity and the possibility of being applied in a game-based format. Game elements can significantly increase students' motivation to learn and also contribute to a deeper assimilation of educational material. At present, there are numerous educational games and simulators that can be used as additional tools in the educational process.

However, despite all the advantages of digital educational resources, their use may also have certain negative consequences. For example, excessive reliance on technology can lead to reduced attention and concentration among students, as well as negatively affect their psychological and physical health. Therefore, it is very important to balance the use of digital educational resources with traditional teaching methods and to ensure adequate rest and a proper daily routine for students.

The use of digital educational resources is a necessary condition for effective and high-quality education today. However, in order to maximize their benefits, it is essential to approach their

selection and use appropriately, while also taking into account the individual characteristics and needs of each student.

Methods

To conduct the research on the impact of using digital educational resources on the development of cognitive independence, a group of future teachers was selected. All participants of the group studied various disciplines with the use of digital educational resources.

The use of digital educational resources has become an integral part of modern education. They make it possible to expand the opportunities of the educational process and ensure the accessibility of education for a wide range of learners. At present, there is a large variety of digital educational resources, such as electronic textbooks, interactive textbooks, online courses, webinars, and others.

Recent systematic reviews highlight that effective integration of digital tools in teacher training requires structured professional development programs. These programs should include hands-on training, mentorship, and continuous support to ensure sustainable pedagogical transformation. The TPACK framework (Technological Pedagogical Content Knowledge) is widely used to guide teachers in integrating technology meaningfully into their instruction.

One of the main advantages of using digital educational resources is the possibility of creating individualized learning pathways and programs for each student. This allows teachers and students to adapt the educational process to the individual needs and characteristics of each learner. As a result, students can receive higher-quality education, while teachers can work more effectively and efficiently with their students.

However, in order for the use of digital educational resources to be effective, teachers must possess the appropriate qualifications and knowledge in the field of digital technologies. They should know how to use these resources in the educational process and how they can help students improve their skills and knowledge. Studies show that digital competence among teachers significantly influences the quality of instruction and student outcomes.

To assess the level of cognitive independence among the research participants, a self-directed learning test was used. This test included questions aimed at evaluating the ability to independently search for information, analyze it, make decisions, and solve problems. According to recent findings, self-directed learning (SDL) is closely linked to students' ability to manage their own learning, set goals, and reflect on progress.

Interestingly, the use of digital educational resources can influence not only the level of students' cognitive independence but also their motivation to learn. The use of interactive and diverse digital resources can make the learning process more engaging and interesting, which, in turn, can increase students' motivation to study and consequently improve their academic performance. For example, gamified content and augmented reality tools have shown to increase motivation by up to 30% and improve knowledge retention by over 25%.

In the course of the study, various digital educational resources were used, such as electronic textbooks, interactive textbooks, online courses, webinars, and others. The research participants studied different disciplines with the use of these resources. For example, they studied history, geography, mathematics, the Russian language, and other subjects.

In order to assess the effectiveness of using digital educational resources for the development of cognitive independence, the participants were offered a self-directed learning test. It included

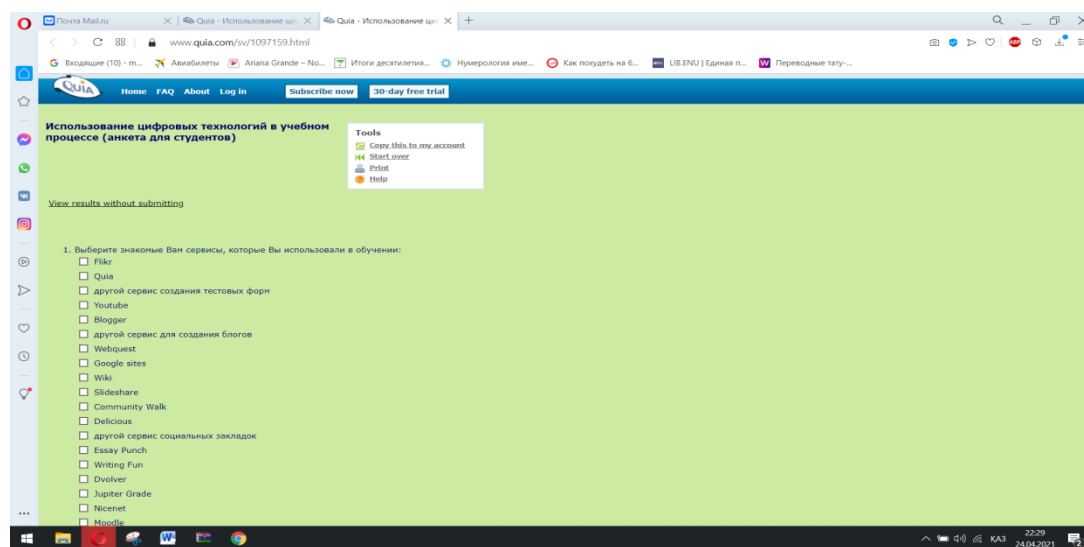
questions aimed at evaluating the ability to independently search for information, analyze it, make decisions, and solve problems. The test was conducted both before and after the study of disciplines using digital educational resources.

Teachers and students of the Korkyt Ata Kyzylorda University were involved as respondents.

First, as part of the research, diagnostic experimental work was carried out, and questionnaires were collected from students of the 1st–4th years of the educational program 6B0101 (5B010000) on the topic “Application of Digital Technologies in the Learning Process,” as well as from teachers of pedagogical specialties on the topic “Application of Digital Technologies in Professional Activities.”

<http://www.quia.com/sv/1097158.html>

<http://www.quia.com/sv/1097159.html>



In the diagnostic experiment, 140 students and 40 teachers from the 1st to 4th years of the educational program “Education” took part. To determine the cognitive independence of future teachers in the use of digital resources, we applied V. S. Yurkevich’s questionnaire “Methodology for Determining the Strength of Cognitive Need” and the diagnostic questionnaire “Methodology for Determining Cognitive Activity” (L. A. Chervyakova, Yu. V. Boyko). As a result, together with academic advisors, an article was written. It was submitted to a journal indexed in Scopus.

Results and discussion

The analysis of the research results showed that the use of digital educational resources really contributes to the development of cognitive independence of future teachers. Most of the study participants demonstrated a higher level of learning independence after using digital educational resources.

This suggests that the use of modern technologies in teaching not only increases the effectiveness of the learning process but also contributes to the development of valuable skills and abilities among students.

Digital educational resources (hereinafter referred to as CBR) are one of the components of the e-learning system that determines the content of Education. The active use of CBR by the

younger generation in the educational process to ensure the high quality of education is one of the most pressing problems facing the pedagogical community within the framework of this program today.

The analysis of the research results showed that the use of digital educational resources indeed contributes to the development of cognitive independence among future teachers. Most participants demonstrated a higher level of self-directed learning after using digital educational resources. This indicates that the integration of modern technologies in education not only enhances the efficiency of the learning process but also fosters the development of valuable skills and abilities in students.

Recent meta-analyses confirm that self-directed learning (SDL) in digital environments significantly improves academic performance, with a standardized mean difference of 0.366 compared to traditional methods. This supports the idea that digital tools empower learners to take ownership of their learning, set goals, and reflect on their progress.

One of the advantages of using digital educational resources is their accessibility for learning anytime and anywhere. Students can study materials at a convenient time, regardless of the class schedule. This enables future teachers to acquire self-learning skills that can be applied in their future professional practice. In addition, digital educational resources provide opportunities for the individualization of learning and the adaptation of the educational process to the specific needs of each student.

Digital platforms such as intelligent tutoring systems, gamified learning environments, and AI-powered feedback tools have been shown to enhance motivation and engagement by fulfilling psychological needs for autonomy, competence, and relatedness, as described in Self-Determination Theory. These tools not only support academic success but also contribute to emotional regulation and mental well-being.

It is important to note that the use of digital educational resources also broadens the horizons of future teachers and improves their level of information literacy. Through interactive textbooks and online courses, future teachers can gain a more comprehensive understanding of the subjects studied and acquire additional knowledge and skills. This not only helps them to teach their future students more effectively but also increases their level of competence and credibility in the eyes of colleagues and employers.

However, it must be taken into account that digital educational resources cannot fully replace traditional teaching methods such as lectures, seminars, and practical classes. It is essential to approach the use of digital resources in education with an understanding of both their potential and limitations and to combine them with other teaching methods in order to achieve maximum effectiveness.

Some researchers caution that overreliance on digital tools may reduce students' cognitive effort and critical thinking if not balanced with reflective tasks and human interaction. Therefore, educators must design learning environments that encourage active engagement and analytical reasoning.

Furthermore, recent studies emphasize the importance of digital literacy and ethical use of technology in teacher education. Future educators must be equipped not only with technical skills but also with the ability to critically evaluate digital content, ensure data privacy, and promote responsible digital behavior. These competencies are essential in preparing teachers for the challenges of modern classrooms.

Additionally, longitudinal studies in digital pedagogy suggest that sustained exposure to well-designed digital environments leads to improved problem-solving abilities and long-term retention of knowledge. For example, learners who engaged with adaptive learning systems

over a semester showed a 20–25% increase in performance compared to those in traditional settings. These findings reinforce the importance of integrating digital tools strategically and consistently.

Overall, the use of digital educational resources offers numerous advantages for the development of cognitive independence in future teachers. It allows them not only to learn more effectively but also to develop valuable skills that will be useful in their professional careers. Nevertheless, it is important to maintain a balance between digital and traditional teaching methods to achieve the best possible outcomes.

Thus, when analyzing a questionnaire aimed at identifying the cognitive independence of the teacher, the following results were obtained, which showed that if 14% of the students in the experimental group were characterized by active development on this issue before conducting experimental work, the development of independence strongly depends on the conditions - 54%; With poor development – 32%, the indicators have changed significantly after the experimental work, the active development of independence through digital resources prevails in 56% of students, with insufficient development in 41%, and weak in 3% of students.

We attribute the presence of positive dynamics primarily to the students' understanding of the importance of SDG in the development of cognitive independence.

Based on the results of the experimental work, it should be noted that when preparing a future teacher at a university in order to form and develop cognitive independence, it is necessary that the student have the opportunity to be involved in innovative activities for the development of new digital technologies.

Conclusion

In today's world, digital technologies are widely used in many areas of life, including education. They provide unique opportunities for the development of cognitive independence of future teachers and for enhancing the overall effectiveness of learning.

The use of digital educational resources is one of the ways to achieve this goal. They provide students with access to a large amount of educational materials and help them broaden their horizons, increase information literacy, and develop self-learning skills. Through the use of interactive textbooks and online courses, future teachers can gain a more comprehensive understanding of the disciplines studied and acquire additional knowledge and skills.

Recent studies confirm that digital learning environments foster autonomy and metacognitive skills, which are essential for lifelong learning. According to the OECD's Trends Shaping Education 2025 report, digital platforms are transforming education by enabling personalized learning, promoting equity, and preparing students for future challenges. Moreover, digital participation is accelerating globally, with over 38% of people now creating and sharing content online, compared to just 10% in 2008.

In addition, digital educational resources increase accessibility to education. Students can study materials at a convenient time, regardless of the class schedule. This allows future teachers to acquire self-learning skills that can be applied in their future professional activities. Digital resources also provide opportunities for the individualization of learning and the adaptation of the educational process to the individual needs of each student.

However, it is necessary to find a balance between the use of digital technologies and traditional teaching methods. Traditional methods such as lectures and seminars remain an

important element of education and may be more effective in certain situations—for example, when discussing complex topics, conducting discussions, or providing real-time feedback.

It is also important to note that not all students are equally oriented toward the use of digital educational resources. Some may find it difficult to navigate large volumes of information or to work with technology. Therefore, it is essential to provide students with diverse learning options that take into account their individual needs and abilities.

Another important aspect of using digital educational resources is their quality. High-quality materials created by specialists with appropriate academic training and experience can significantly improve the effectiveness of learning. However, not all materials available online are reliable and of high quality. Therefore, it is important to pay attention to the credibility of sources and to approach information critically.

It is also necessary to consider the specifics of learning at different stages of the educational process. For example, digital educational resources may be less suitable for younger students than for senior classes and university students. Age-related and cognitive characteristics of learners should be taken into account when choosing teaching methods and digital resources.

Sociocultural aspects of using digital educational resources should also be considered. Some students may not have access to modern technologies or experience in using them. In such cases, it is necessary to provide opportunities for learning in traditional formats and to ensure access to the required technical means and services.

Furthermore, the ethical use of digital resources must be emphasized. Teachers and students should be aware of data privacy, digital citizenship, and responsible use of technology. These aspects are increasingly important in the context of global digital transformation in education.

Additionally, UNESCO's 2024 Global Education Monitoring Report highlights the need for inclusive digital education strategies that address disparities in access, digital literacy, and infrastructure. It stresses that digital tools should not only be available but also usable and meaningful for all learners, regardless of socioeconomic background.

Overall, the use of digital educational resources offers numerous advantages that can significantly improve the quality of education and the development of cognitive independence of future teachers. However, it is important to take into account the specific context and the characteristics of students, as well as to select high-quality materials and diverse teaching methods. Finding a balance between digital technologies and traditional teaching methods is essential in order to create conditions in which every student can effectively acquire the necessary knowledge and skills.

Contribution of the authors

Usenova G. – organized and conducted the main experiment within the framework of the study, and described the research methods

Kenzhebayeva K. – was responsible for the concept of the research work and developed a detailed plan for data collection, selection of methods of analysis, data collection and data processing.

Agbayeva U.B. – made a significant contribution to the concept or design of the work

Yernazarova G.Sh. – collection, analysis and interpretation of the results of the work.

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References

- Chai, C.S., Koh, J.H.L. & Tsai, C.C. (2017). Facilitating pre-service teachers' development of technological, pedagogical, and content knowledge (TPACK) through collaborative design. *Journal of Educational Technology Development and Exchange*, 10(1), pp.1–12. <https://aquila.usm.edu/jetde/vol10/iss1/1/>
- Dabbagh, N. & Kitsantas, A. (2012). Personal Learning Environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. *The Internet and Higher Education*, 15(1), pp.3–8. <https://doi.org/10.1016/j.iheduc.2011.06.002>
- Jabeen, F., Tandon, A., Azad, N., Islam, A.K.M.N. and Pereira, V. (2022). 'The dark side of social media platforms: A situation–organism–behaviour–consequence approach'. *Technological Forecasting and Social Change*, 182, 122104. <https://doi.org/10.1016/j.techfore.2022.122104>
- Johnson, L. et al. (2016). NMC/CoSN Horizon Report: K-12 Edition. Austin, Texas: The New Media Consortium. <https://www.nmc.org/publication/nmc-cosn-horizon-report-2016-k-12-edition/>
- Kafai, Y.B. & Burke, Q. (2016). *Connected gaming: What making video games can teach us about learning and literacy*. Cambridge, MA: MIT Press. <https://mitpress.mit.edu/9780262529947/connected-gaming/>
- Kim, M.K. et al. (2014). The experience of three flipped classrooms in an urban university: an exploration of design principles. *The Internet and Higher Education*, 22, pp.37–50. <https://doi.org/10.1016/j.iheduc.2014.04.003>
- OECD (2015). *Students, Computers and Learning: Making the Connection*. OECD Publishing. <https://www.oecd.org/education/students-computers-and-learning-9789264239555-en.htm>
- Trust, T. and Prestridge, S. (2021). 'The interplay of five elements of influence on educators' PLN actions'. *Teaching and Teacher Education*, 97, 103195. ISSN 0742-051X. <https://doi.org/10.1016/j.tate.2020.103195>
- Wang, Q., Chen, L. & Liang, Y. (2011). The effects of social media on college students. *Journal of Educational Technology Development and Exchange*, 4(1), pp.1–14. <https://aquila.usm.edu/jetde/vol4/iss1/1/>
- Warschauer, M. & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education*, 34(1), pp.179–225. <https://journals.sagepub.com/doi/10.3102/0091732X09349791>
- Wenglinsky, H. (2005). *Using technology wisely: The keys to success in schools*. New York: Teachers College Press. <https://www.tcpress.com/using-technology-wisely-9780807745801>
- Zhu, Z., Liu, Y. & Bao, H. (2016). Investigating the relationships between motivation, self-regulated learning, and academic achievement for Chinese undergraduate students. *Frontiers in Psychology*, 7, p.1511. <https://doi.org/10.3389/fpsyg.2016.01511>
- Беркімбаев, К.М., Ниязова, Г.Ж., Искендірова, Г.С., Бекболат, М.С. (2022). Цифрлық педагогика [Мәтін]: Оқу құралы. Алматы: ADAL КІТАП, 129 б.
- Жаппасова, К.А., Тастанов, М.Г. (2024). «Электрондық білім беру ресурстарын пайдалану әдістемесі». Ахмет Байтұрсынов атындағы Қостанай өңірлік университетінің хабаршысы, 73(1), 74–79. Available at: <https://dspace.kspi.kz/handle/123456789/6921> (accessed: 25 August 2025).
- Сейтқазы, П.Б., Сүлейменова, Ж.Т. (2022). «Жоғары білім беруді цифрландыру: трендтер және олардың ерекшеліктері». «Педагогика» кафедрасының 60 жылдығына арналған «Заманауи қоғам және педагогикалық білім беру» тақырыбындағы халықаралық ғылыми практикалық конференция материалдарының жинағы, 22 сәуір 2022 ж. Л.Н. Гумилев атындағы Еуразия ұлттық университеті. ISBN 978-601-337-659-2. Available at: <http://rep.enu.kz/handle/enu/2903> (accessed: 25 August 2025).

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Болашақ педагогтардың танымдық дербестігін цифрлық білім беру ресурстарын пайдалану негізінде дамыту

Аңдатпа. Бұл мақала болашақ мұғалімдердің танымдық дербестігін дамыту үшін цифрлық білім беру ресурстарын пайдаланудың тиімділігін зерттеуге арналған. Пәндерді оқу үшін цифрлық ресурстарды белсенді пайдаланған студенттер зерттеуге тартылып, нәтижелерге талдау жасалды. Зерттеудің негізгі мақсаты білім беру үдерісінде цифрлық білім беру ресурстарын пайдалану студенттердің танымдық дербестігін дамытуға қалай ықпал ететінін анықтау болды.

Зерттеу нәтижелерін талдау цифрлық білім беру ресурстарын пайдалану студенттердің танымдық дербестігін дамытуға шынымен ықпал ететінін көрсетті. Сонымен қатар, цифрлық білім беру ресурстарының оқу үшін әсіресе пайдалы ететін бірнеше артықшылықтары бар екені атап өтілді. Атап айтқанда, сандық білім беру ресурстары студенттердің көпшілігіне қолжетімді, бұл оларды кез келген жерде және кез келген уақытта пайдалануға ыңғайлы етеді. Сонымен қатар, олардың интерактивтілігі және оқушының білім деңгейі мен қажеттіліктеріне сәйкес оқытуды теңдеу мүмкіндігі бар.

Мақалада білім беру үдерісінде цифрлық білім беру ресурстарын пайдалану мүмкіндіктері де қарастырылып, оларды пайдалану бойынша ұсыныстар берілген. Цифрлық білім беру ресурстарын пайдалану білім сапасын арттырады және болашақ мұғалімдердің танымдық дербестігін дамытады. Осылайша, бұл зерттеу білім беруде цифрлық білім беру ресурстарын пайдаланудың маңыздылығын көрсетеді және оларды тиімді пайдалану бойынша нақты ұсыныстарды ұсынады.

Түйін сөздер: танымдық дербестік, даму, болашақ мұғалімдер, цифрлық білім беру ресурстары, өздігінен білім алу, құзыреттіліктер.

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Развитие познавательной самостоятельности будущих учителей на основе использования цифровых образовательных ресурсов

Аннотация. Статья посвящена исследованию эффективности использования цифровых образовательных ресурсов для развития познавательной самостоятельности будущих учителей. В исследовании приняли участие студенты, активно использовавшие цифровые ресурсы при изучении учебных дисциплин, и были проанализированы полученные результаты. Основной целью исследования было выяснение того, каким образом применение цифровых образовательных ресурсов в учебном процессе способствует развитию познавательной самостоятельности у студентов.

Анализ результатов показал, что использование цифровых образовательных ресурсов действительно способствует развитию познавательной самостоятельности студентов. Кроме того, было отмечено, что цифровые ресурсы обладают рядом преимуществ, делающих их особенно полезными для обучения. В частности, цифровые образовательные ресурсы доступны большинству студентов, что делает их удобными для использования в любое время и в

любом месте. Также они обладают интерактивностью и возможностью адаптации обучения в соответствии с уровнем знаний и потребностями обучающегося.

В статье также рассматриваются возможности применения цифровых образовательных ресурсов в учебном процессе и предлагаются рекомендации по их эффективному использованию. Применение цифровых образовательных ресурсов способствует повышению качества образования и развитию познавательной самостоятельности будущих учителей. Таким образом, данное исследование подчеркивает важность использования цифровых образовательных ресурсов в системе образования и предлагает конкретные рекомендации по их внедрению.

Ключевые слова: познавательная самостоятельность, развитие, будущие учителя, цифровые образовательные ресурсы, самообучение, компетенции.

References

- Chai, C.S., Koh, J.H.L. & Tsai, C.C. (2017). Facilitating pre-service teachers' development of technological, pedagogical, and content knowledge (TPACK) through collaborative design. *Journal of Educational Technology Development and Exchange*, 10(1), pp.1–12. <https://aquila.usm.edu/jetde/vol10/iss1/1/>
- Dabbagh, N. & Kitsantas, A. (2012). Personal Learning Environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. *The Internet and Higher Education*, 15(1), pp.3–8. <https://doi.org/10.1016/j.iheduc.2011.06.002>
- Jabeen, F., Tandon, A., Azad, N., Islam, A.K.M.N. and Pereira, V. (2022). 'The dark side of social media platforms: A situation–organism–behaviour–consequence approach'. *Technological Forecasting and Social Change*, 182, 122104. <https://doi.org/10.1016/j.techfore.2022.122104>
- Johnson, L. et al. (2016). NMC/CoSN Horizon Report: K-12 Edition. Austin, Texas: The New Media Consortium. <https://www.nmc.org/publication/nmc-cosn-horizon-report-2016-k-12-edition/>
- Kafai, Y.B. & Burke, Q. (2016). *Connected gaming: What making video games can teach us about learning and literacy*. Cambridge, MA: MIT Press. <https://mitpress.mit.edu/9780262529947/connected-gaming/>
- Kim, M.K. et al. (2014). The experience of three flipped classrooms in an urban university: an exploration of design principles. *The Internet and Higher Education*, 22, pp.37–50. <https://doi.org/10.1016/j.iheduc.2014.04.003>
- OECD (2015). *Students, Computers and Learning: Making the Connection*. OECD Publishing. <https://www.oecd.org/education/students-computers-and-learning-9789264239555-en.htm>
- Trust, T. and Prestridge, S. (2021). 'The interplay of five elements of influence on educators' PLN actions'. *Teaching and Teacher Education*, 97, 103195. ISSN 0742-051X. <https://doi.org/10.1016/j.tate.2020.103195>
- Wang, Q., Chen, L. & Liang, Y. (2011). The effects of social media on college students. *Journal of Educational Technology Development and Exchange*, 4(1), pp.1–14. <https://aquila.usm.edu/jetde/vol4/iss1/1/>
- Warschauer, M. & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education*, 34(1), pp.179–225. <https://journals.sagepub.com/doi/10.3102/0091732X09349791>
- Wenglinsky, H. (2005). *Using technology wisely: The keys to success in schools*. New York: Teachers College Press. <https://www.tcpress.com/using-technology-wisely-9780807745801>
- Zhu, Z., Liu, Y. & Bao, H. (2016). Investigating the relationships between motivation, self-regulated learning, and academic achievement for Chinese undergraduate students. *Frontiers in Psychology*, 7, p.1511. <https://doi.org/10.3389/fpsyg.2016.01511>

Berkimbaeva, K.M., Niyazova, G.Zh., Iskendirova, G.S., Bekbolat, M.S. (2022). Tsifrlyq pedagogika : Oqu quraly. ADAL KITAP, 129 b. (in Kazakh).

Zhappasova, K.A., Tastanov, M.G. (2024). 'Elektrondyq bilim beru resurstaryn paidalanu ádistemesi [Methodology of Using Electronic Educational Resources]'. Ahmet Baitursynov atyndaǵy Qostanai óńirikti universitetiniń habarshysy, 73(1), pp. 74–79. Available at: <https://dspace.kspi.kz/handle/123456789/6921> (accessed: 25 August 2025). (in Kazakh).

Seitqazy, P.B., Sileimenova, Zh.T. (2022). 'Joǵary bilim berudi tsifrlandyru: trendyler jáne olardyń erekshelekteri [Digitalization of Higher Education: Trends and Their Features]'. «Pedagogika» kafedrasynyń 60 jyldyǵyna arnalǵan «Zamanaýy qoǵam jáne pedagogikalyq bilim beru» taqyrybyndaǵy halyqaralyq ǵylymi-praktikalyq konferentsiıa materialdarynyń jynaǵy, 22 saýir 2022 j., L.N. Gumilev atyndaǵy Eurasia ulttyq universiteti. ISBN 978-601-337-659-2. Available at: <http://rep.enu.kz/handle/enu/2903> (accessed: 25 August 2025). (in Kazakh).

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