HĞTAR 14.25.09 https://www.doi.org/10.53355/ZHU.2024.112.4.002

FORMATION OF STUDENTS' COGNITIVE ABILITIES THROUGH CLASSIFICATION AND USE OF DIGITAL EDUCATIONAL TECHNOLOGIES IN THE LEARNING PROCESS

G.B. Issayeva [1,], G.S. Ussenova [2]*

[1]Abai Kazakh National Pedagogical University, Republic of Kazakhstan, Almaty
[2]Kyzylorda Korkyt Ata University, Republic of Kazakhstan, Kyzylorda
**e-mail: guka_issaeva@mail.ru, ussen_gulnur@bk.ru*

This article discusses the main types of digital educational technologies and their use in the educational process. Digital technologies play an important role in improving the educational process, increasing students' interest in education and developing their cognitive abilities. The article analyzes the classification of digital educational tools, such as interactive platforms, virtual laboratories, online courses and simulations. In addition, teaching methods aimed at increasing students' cognitive activity are described. Effective use of digital technologies encourages students to quickly absorb information, deeply understand it and learn independently. The final part discusses the benefits of introducing digital technologies into the educational process and the difficulties that arise when using them, and identifies the main directions for the formation of students' cognitive abilities. Using software intelligence, it is possible to develop software technologies that can reach the level of human cognition. It provides several aspects of its abilities that allow you to change your thinking, make different decisions and create new programs. With the help of biometric technologies, new opportunities can be discovered that allow human cognition to reach a new level. One of the most important needs is to find ways to reach a new level of knowledge through the use of digital technologies. By using these technologies correctly and effectively, such a level of knowledge can be achieved.

Keywords: *digital skills, information technology, digital devices, digital security, digitalization, e-learning, electronic library*

Introduction

Nowadays IT went through different fields of society, including it is developing in educational field. Issues in informatization of education implemented through many-sided events, one of the main directions are the effective use of this technology in the educational process as an aid to learning and teaching subjects [1].

Informatization of education it is issues of one of the main ways. In this process only ready digital of educational resources and electronic books, but not only in educational process, as well do needed analyze, must pay attention in using it effectively.

Digital skills- it is personal using of digital stuffs (PC, smartphone and etc.) and search for information, share and skill of using with apps for protecting. Working with resources and digital things exceeded with objectives of IT specialist. So these are most needed skills for people who are living and working [2]. Nowadays people started estimating time, comfort zone and noticed comfortable using of digital functions. They should improve their competences to us them correctly.

In the "Digital Kazakhstan" program, approved by the Government of the Republic of Kazakhstan on December 12, 2017, the issue of significantly surpassing the current system of production requirements for professions involved in the labor market is addressed [3]. This situation may result from the lack of a prompt connection between the labor market and the education system, potentially leading to the training of unneeded personnel and the redundancy of specialists in "dying" professions. It is necessary to completely revise the content of all levels of

education to develop digital skills in all specialists. The program aims to develop digital literacy in secondary, technical, vocational, and higher education systems.

Under this objective, the focus of education should shift from memorizing subject content and formulas to developing information analysis skills and fostering creative thinking. This approach will align education with the needs of the digital economy ("Digital Kazakhstan" State Program, 2017). Digitalization, as outlined in law, encompasses not only the education sector but also all aspects of human life. This means that everyone, whether a school student, a university student, or an adult, all of them should know about digital literacy [4].

Materials and methods

Nowadays the pandemic that went viral everywhere has driven the widespread use of these resources, enabling people from all corners of the world to exchange information and acquire knowledge through video and audio conferences. However, this type of communication has introduced new challenges to the social value of speed and frequency in real-time information exchange. With the advancement of technology, laws, policies, personal skills, and attitudes need to be developed or redefined to promote desired aspects and minimize negative impacts. From this perspective, the use of information technology tools has become one of the primary solutions to address challenges arising in the field of education.

Learning new information and communication technologies in education is a necessity of the modern era. The 21st century is characterized by competition, the exchange of information, innovative technologies, and reforms. It is the age of information technology. Information and communication technologies (ICT) play a vital role in developing the education system in contemporary society. The goals of informatizing education and teaching subjects on a scientific and technological basis are being prioritized [5]. During the development of informatization technologies, the primary responsibility of educators is to train skilled and knowledgeable professionals who meet modern demands. The rapid advancement of informatization processes in society requires shaping individuals who are versatile and proficient in new technologies.

In address of the President of the Republic of Kazakhstan, Kassym-Jomart Tokayev, to the nation, "The Unity of the People and Systemic Reforms – A Solid Foundation for the Country's Prosperity," emphasized: "In the modern era, one of the key factors of competitiveness is comprehensive digitalization. For Kazakhstan, it is particularly important to implement advanced digital technologies. These and other tasks necessitate a complete “digital reboot” of the public sector.

"We must be able to harness the vast informational and telecommunication potential of our country. In the new digital era, this will hold geopolitical significance. Kazakhstan must become a central digital hub for the majority of the Eurasian region," said the President. As one of the prerequisites for implementing this address, the State Program for the Development of Education in the Republic of Kazakhstan identifies several key objectives: "Electronic learning as a primary direction for modernizing education, ensuring 90% of educational organizations have access to the necessary online resources, equipping secondary, technical, and vocational education (TVET) institutions with comprehensive digital educational content, and developing digital educational resources created by educators." These objectives are successfully being realized [6].

This highlights the significance of using digital educational resources in the educational process, describing their methodological features and analyzing the structure and content of digital learning resources (DLR) developed within the framework of the e-learning system project. Furthermore, the requirements, principles, content of collections, and methods for applying DLR are outlined.

Article 11, Clause 9 of the «Law on Education» of the Republic of Kazakhstan stipulates the necessity of implementing and effectively utilizing new teaching technologies, including distance learning and information and communication technologies (ICT), which enable professional education programs to adapt swiftly to the changing needs of society and the labor market. In this context, digital educational resources are viewed as tools for implementing new teaching methods and ensuring

comprehensive educational and cognitive activities for learners. DLRs are particularly well-suited for enhancing traditional teaching methods, as they allow for the integration of visual learning materials, enriched designs, and extensive audio and video resources [7].

The use of Digital Learning Resources (DLRs) in the educational process yields several benefits:

- the integration of DLR elements into various stages of lessons increases the efficiency of the learning process.
- both educators and learners gain access to diverse materials for lesson preparation.
- it enables the demonstration of dynamic processes (e.g., video clips, animations).
- the visual appeal of lessons is enhanced.
- it provides opportunities to observe objects and processes that cannot be demonstrated using other methods.
- by utilizing local networks, learners can effectively refine their skills and competencies during lesson preparation.

The primary component of the Electronic Learning Information System (ELIS) designed to assist educators in preparing their own materials is the electronic library. This library includes methodological recommendations and thousands of DLRs. The "DLR Designer" module, consisting of two functional parts, allows educators to develop online courses directly within the ELIS Learning Management System (LMS). This module enables the structuring of courses and the enrichment of their content by linking individual elements from the electronic library's educational resources. The online service for creating DLRs offers tools for developing specialized digital materials, independent of whether integration with the LMS is available. Currently, as part of the ELIS implementation project, many educational institutions are equipped with software that facilitates the creation of DLRs in online mode. This software significantly broadens the opportunities for educators to design and utilize tailored digital resources [8].

Digital educational resources cannot replace teachers but serve as a valuable supplement, offering additional materials that enhance lesson content with the latest multimedia capabilities of information and communication technologies. They help draw students' attention to key educational topics, focus on specific features of studied phenomena when necessary, and present them visually. These resources also facilitate linking lesson content to societal changes, real-life experiences, students’ interests in the subject, and other relevant phenomena.

Modern society demands talented and capable individuals. Since education is an integrated system, there is always room for innovation. The need for innovation is often driven by external factors, such as addressing human needs, fulfilling students' aspirations for knowledge and skills, and fostering personal development through high-quality education. Educational advancements and societal progress share a common goal: enhancing the capacity for growth and development.

The direction and success of innovation efforts depend on the level and nature of societal needs. Therefore, the justification for such efforts should not be limited to narrowly defined tasks. In this regard, identifying ways to achieve new levels of cognition through digital technology is a rapidly growing focus across all areas of life, including education. The comprehensive use of digital technologies in lessons simplifies many challenging aspects of a teacher’s work while expanding opportunities for cognitive development. By integrating these technologies, educators can facilitate a deeper, broader understanding of subjects and make the learning process more engaging and efficient [9].

Digital Educational Content it refers to digital didactic materials for teaching subjects in an interactive format. These include photos, audio and video fragments, static and dynamic models, virtual reality objects, interactive simulations, and other resources. As technology evolves, the education system is undergoing significant changes. During the shift to remote learning, teachers realized the need not only to update their teaching methods but also to enhance accessibility to knowledge.

To achieve this, making video lessons by the best teachers and instructors widely accessible online allows both learners and young professionals to access what they need. Considering the

progressive growth of innovative changes in the current education system, basic computer skills alone are insufficient. Educators must continually demonstrate a multifaceted and inquisitive approach, with their innovative and technological understanding regularly reflected in their teaching practices.

To reach a new level of cognition through the use of digital technologies, several complex and effective strategies are outlined. Some of them:

The Use of Information Technologies in Teaching Systems, by employing virtual and industrial information technologies, it becomes possible to renew knowledge and adapt to the individualized needs and levels of learners. Teachers can provide personalized services tailored to the abilities and progress of each student.

Telemedicine Services, these allow professionals to access effective diagnostic and therapeutic consultations remotely. In such cases, digital technologies play a critical role in enabling complex diagnostic and comparative processes [10].

Interactive programs significantly enhance the possibility of engaging learners, course participants, and instructors in interactive communication. These tools enable a more collaborative and dynamic learning environment. Emerging participants in industrial culture are becoming contributors to the new content and meaning of our cognition.

To elevate digital technologies to a new level, educational institutions and specialized systems in the public sector must adopt complex strategies rooted in individual scientific and technological development. This approach enables the discovery of new facets of cognition. However, these new opportunities necessitate support systems for the production, delivery, and storage of enabling technologies.

The qualification levels of teachers in accordance with the electronic education system can be divided into several levels: simple adaptive level. This level covers skills in using computers and computer technology, and the ability to use applied software in the educational process. Practical research level. The teacher practically masters the basics of working with ICT. Systematic creative level. Development of electronic educational and methodological tools, development of websites.

Main Part

Digital educational resources should be accessible to every user in various convenient formats, independent of the connection point to the portal. These resources can be used by educators for teaching, by students for self-preparation, and as reference materials. Digital educational resources should enable instructors to create learning materials for different teaching purposes. The foundation of preparing digital educational resources relies on video and multimedia explanations.

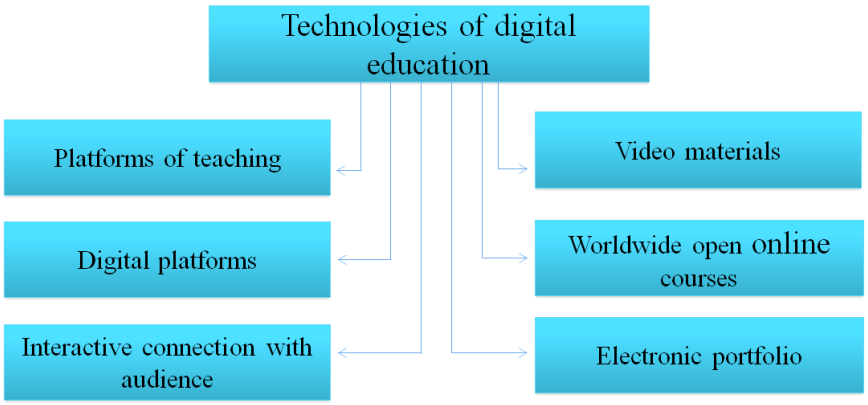
Any task is presented as a dialogue. A key factor contributing to the development of students' cognitive abilities is digital educational resources. Digital information sources include digital educational resources, e-books, innovative educational-methodological complexes, virtual laboratories, and complex information sources (digital museums, libraries, encyclopedias). All of this can be seen as a concrete example of the digital age. The uniqueness of this technology lies in its ability to foster students' cognitive activity and curiosity.

Organizing the learning process in a new way helps create favorable conditions for students' self-development, fostering their creativity, independent actions, and the enhancement of individual abilities. When teaching using such new technologies, the main requirement for the teacher is to correct the child's response, demonstrate how to complete the task, and teach the child how to express their thoughts in an organized and complete manner. Allowing students to fully express their thoughts and giving them the freedom to voice their opinions increases their interest in the lesson. Through the use of new innovative pedagogical technologies, the teacher forms and develops themselves.

Digital education refers to the innovative use of digital tools and technologies in teaching and learning, often referred to as advanced technologies or eLearning. Over time, as technology has developed and diversified, educational technologies have also evolved. In the late 1990s and

early 2000s, the focus was primarily on information and communication technologies (ICT), with many initiatives aimed at providing teachers and students with more equipment (such as personal computers) and exploring how these tools could be used in various ways to improve teaching and learning. In the 2000s, the concept expanded into eLearning or digital learning (LwDT).

The modern classification of educational digital technologies is very broad and is linked to the economic development level of the country. The process of digitalizing education is uneven: there is a gap between those who have access to digital technologies and those who, for various reasons, do not. The gap resulting from unequal access to digital resources is commonly referred to as the "digital divide." The general classification of digital educational technologies is shown in picture – 1.



Picture 1 – Directions of Technologies of digital education

Looking into the what kind of possibilities for teachers and pupils could get by examples automated digital technologies that used in different countries, the analyze has shown in table 1.

Table 1 – Examples automated digital technologies

Digital education environment	Users	Users possibilities	Role of teacher	Disadvantages of system	Examples
Module systems	Educators in educational institutions (as well teachers)	Users have access to tools for taking notes, creating tables, and monitoring and organizing students' educational activities. The system includes information about each learner, their individual achievements, and the requirements they need to meet during their studies, and guidelines for the educational process.	Классикалық түрдегі мұғалім. Оқытушы білім алушылар үшін білім беру құралдарын (тесттер, тексеру, тапсырмалар және т.б.) таңдайды және жасайды.)	Not flexible for users. There is a requirement to use only predefined modules.	PIES, NGDLE and etc.

Digital education environment	Users	Users possibilities	Role of teacher	Disadvantages of system	Examples
Distance education	Any users	Students are provided access to various tests (with open or closed questions) and a range of educational videos during their studies. Upon completing the course, each student can take an exam and receive a certificate of completion. Instructors can create online courses, theoretical lessons, or practical modules but do not participate directly in educational activities.	Self-study without teacher or supervisor	Lack of motivation or low motivation among students to complete the course. The tools for creating courses are often not flexible enough and are standardized, making them unsuitable for all types of courses.	Coursera, edX, XeuetangX, FutureLearn and udacity and etc.
LMS and LCMS systems	Paid online schools, some students and teachers in universities	Creating, managing, and delivering online learning materials. An LMS provides a convenient, unified learning environment for studying theory, engaging in active practice, and receiving feedback from students. Such systems enable teachers to design courses in a visually immersive virtual environment.	The teacher acts as a coach, mentor, or instructor. Students select a course, and the mentor or coach supports and guides the educational process throughout the course. The teacher chooses educational tools based on the student's abilities and progress.	Not a free tool, no editing	Netologies of system LMS, LMS of higher economy school Adobe Captivate Prime, Moodle, Claroline and etc.

The main thing is- educators should improve their skills and knowledge, the trend life-long learning education went viral.

Results and analyzes

Below using of digital educational resources in teaching process there were some works about searching design of new level of knowledge. At first time of designing resources of digital and financial, that used methodological directions for finding out new levels of students.

In the initial stage of the project, data was collected to determine learning outcomes achieved through students' use of digital educational resources. This data included trends in students' use of the internet, online learning platforms, mobile applications, and other digital tools.

The purpose was to analyze how students interact with digital resources and identify effective methods for enhancing their learning experiences.

In the second stage, various pedagogical methods and funding systems were analyzed by consultants and educators to identify ways to enhance cognitive development. These methods were evaluated based on practical applications and newly obtained data. The insights gained from this process aimed to determine the most effective approaches to improving the learning process and outcomes.

In the final stage of the project, tests and comprehensive data analyses were conducted to evaluate how the use of digital educational resources can help students achieve new levels of understanding. Based on these results, a database was created to document students' academic performance and methods for assessing their progress. This database serves as a foundation for developing strategies to improve educational systems.

Conclusion

In conclusion, identifying ways to help learners achieve new levels of cognitive growth through digital technologies plays a crucial role in today's educational environment. The advancement of digital technologies opens up new opportunities for learning and enriches the educational process with multimedia resources, interactive tools, and personalized approaches. It is worth noting that effectively utilizing digital technologies not only requires technical skills but also demands creativity and flexibility from both educators and learners. Continuous adoption and integration of digital tools are essential to providing more efficient and higher-quality education that meets the challenges of the modern world and the demands of society.

Contributions of the Authors

Gulnur Sagidullayevna Usenova

Senior lecturer at the Department of Foreign Languages and Translation, Master of Humanities. She thoroughly reviewed the literature, highlighted the key concepts and principles of using digital educational resources, and outlined their theoretical basis for application in the professional training of pedagogical staff.

Empirical Research: Sharban Musabekkyzy Maigeldieva – Professor at Korkyt Ata Kyzylorda University, Doctor of Pedagogical Sciences. She organized the empirical study aimed at evaluating the effectiveness of using digital educational resources in the training of future educators. She collected and analyzed data, drawing conclusions based on the obtained results.

Methodological Support: Doctor of Pedagogical Sciences- Sharban Musabekkyzy Maigeldieva and Senior Lecturer Gulnur Sagidullayevna Usenova developed methodological materials and tools for implementing digital educational methods in the learning process. They created curricula, instructional materials, and case studies that enable students to engage actively with educational content and develop professional skills.

Editing and Revision: G.B. Isayeva- Candidate of Pedagogical Sciences. She was responsible for making revisions to the article and ensuring it met the requirements of the journal.

Preparation of Charts and Tables: G.B. Isayeva- Candidate of Pedagogical Sciences. She prepared visual charts and tables to present the research findings and formatted them according to the journal's standards. Additionally, she served as the technical correspondent for the project.

REFERENCES:

1. Buharkina, M.Ju. Novye pedagogicheskie i informacionnye tehnologii v sisteme obrazovanija: uchebnoe posobie dlja studentov vysshih uchebnyh zavedenij [New pedagogical and information technologies in the education system: a textbook for students of higher educational institutions] (3-e izd. ispr., dop. M., 2008, 272 p.) [in Russian]

2. Krajnova, L.O. Razvitie poznavatel'noj samostojatel'nosti uchashhihsja v distancionnom obuchenii kak predmet pedagogicheskih issledovanij [Development of cognitive independence of students in distance learning as a subject of pedagogical research] (Sibirskij pedagogicheskij zhurnal. 2014. №2. S. 61-66) [in Russian] http://sp-journal.ru/article/834

3. Lisina, M.I. Formirovanie lichnosti rebjonka v obshhenii [Formation of a child's personality in communication] (SPb.: «Piter», 2009. 318 s.) [in Russian]

4. Polat, E.S. Teorija i praktika distancionnogo obuchenija: ucheb. posobie dlja stud. vyssh. ucheb. zavedenij [Theory and practice of distance learning: textbook manual for students of higher educational institutions] (M.: Izdatel'skij centr «Akademija», 2004. 416 s.) [in Russian]

5. Polovnikova, N.A. O sisteme vospitanija poznavatel'noj samostojatel'nosti shkol'nikov [About the system of education of cognitive independence of schoolchildren] (Sovetskaja pedagogika. 1970. №5. S. 76-83.) [in Russian]

6. Frolova I.T. Filosofskij slovar' [Philosophical Dictionary] (M.: Izd-vo «Respublika», 2001. 720 s.) [in Russian]

7. Chikanceva, N.I. Teoreticheskie osnovy organizacii samostojatel'noj raboty v processe obuchenija shkol'nikov matematike [Theoretical foundations for organizing independent work in the process of teaching schoolchildren mathematics] (M.: Nauch.kn., 1998. 135 s.) [in Russian]

8. Shhukina, G.I. Aktivizacija poznavatel'noj dejatel'nosti uchashhihsja v uchebnom processe [Activation of cognitive activity of students in the educational process] (M.: Prosveshhenie, 1976. 270 s.) [in Russian]

9. Shhukina, G.I. Problema poznavatel'nogo interesa v pedagogike [The problem of cognitive interest in pedagogy] (Moskva: Pedagogika, 1971. 351 s.) [in Russian]

10. Shhukina, G.I. Rol' dejatel'nosti v uchebnom processe [The role of activity in the educational process] (M.: Prosveshhenie, 1986. 245 s.) [in Russian]

ЦИФРЛЫҚ БІЛІМ БЕРУ ТЕХНОЛОГИЯЛАРЫН ЖІКТЕУ ЖӘНЕ ОҚУ ПРОЦЕСІНДЕ ҚОЛДАНУ АРҚЫЛЫ СТУДЕНТТЕРДІҢ ТАНЫМДЫҚ ҚАБІЛЕТТЕРІН ҚАЛЫПТАСТЫРУ

Исаева Г.Б., Усенова Г.С.
Абай атындағы қазақ Ұлттық педагогикалық университеті, Қазақстан Республикасы, Алматы қ.
Қорқыт Ата атындағы Қызылорда университеті, Қазақстан Республикасы, Қызылорда қ.
**e-mail: guka_issaeva@mail.ru, ussen_gulnur@bk.ru*

Бұл мақалада цифрлық білім беру технологияларының негізгі түрлері мен оларды оқу процесінде қолдану жолдары қарастырылады. Цифрлық технологиялар білім беру процесін жетілдіруде, студенттердің білімге деген қызығушылығын арттыруда және олардың танымдық қабілеттерін дамытуда маңызды рөл атқарады. Мақалада цифрлық білім беру құралдарының жіктелуі, мысалы, интерактивті платформалар, виртуалды зертханалар, онлайн-курстар және симуляциялар сияқты құралдар талданады. Сонымен қатар, студенттердің танымдық белсенділігін арттыруға бағытталған оқыту әдістері сипатталады. Цифрлық технологияларды тиімді қолдану студенттерге ақпаратты тез қабылдап, оны терең түсінуге және өз бетінше білім алуға ынталандырады. Қорытынды бөлімде цифрлық технологияларды оқу процесіне енгізудің артықшылықтары мен оларды қолдану барысында туындайтын қиындықтар талқыланып, студенттердің танымдық қабілеттерін қалыптастырудағы негізгі бағыттар анықталған. Бағдарламалық интеллект қолдану арқылы, адамдардың танымының деңгейіне жетуге болатын бағдарламалық технологияларды дамыту мүмкін. Өзінің қабілетінде бірнеше аспектілерді қамтамасыз етеді, мұнда ол танымды өзгертуге, қорытынды түрлі шешімдер қабылдауға, және жаңа бағдарламаларды жасауға мүмкіндік береді. Биометриялық технологиялар арқылы, адамдардың танымы жаңа деңгейлерге жетуге болатын жаңа мүмкіндіктерді ашу мүмкін. Цифрлық технологияларды қолдану арқылы танымның жаңа деңгейіне өсу жолдарын анықтау

үшін ең басты қажеттіліктерден бірі. Бұл технологияларды мақсатқа сәйкес және эффективті қолдану арқылы, танымның деңгейін жеткізуге болады.

Кілттік сөздер: *цифрлық дағдылар, ақпараттық технологиялар, цифрлық құрылғылар, цифрлық қауіпсіздік, цифрландыру, электрондық оқыту, электрондық кітапхана.*

ФОРМИРОВАНИЕ ПОЗНАВАТЕЛЬНЫХ СПОСОБНОСТЕЙ УЧАЩИХСЯ ПУТЕМ КЛАССИФИКАЦИИ И ИСПОЛЬЗОВАНИЯ ЦИФРОВЫХ ОБРАЗОВАТЕЛЬНЫХ ТЕХНОЛОГИЙ В ПРОЦЕССЕ ОБУЧЕНИЯ

Исаева Г.Б., Усенова Г.С.

Казахский национальный педагогический университет имени Абая, Республика Казахстан, г. Алматы
Кызылординский университет имени Коркыт Ата, Республика Казахстан, г. Кызылорда
**e-mail: guka_issaeva@mail.ru, ussen_gulnur@bk.ru*

В данной статье рассматриваются основные виды цифровых образовательных технологий и их использование в образовательном процессе. Цифровые технологии играют важную роль в совершенствовании образовательного процесса, повышении интереса учащихся к образованию и развитии их познавательных способностей. В статье анализируется классификация цифровых образовательных инструментов, таких как интерактивные платформы, виртуальные лаборатории, онлайн-курсы и симуляции. Кроме того, описаны методы обучения, направленные на повышение познавательной активности учащихся. Эффективное использование цифровых технологий побуждает студентов быстро усваивать информацию, глубоко ее понимать и учиться самостоятельно. В заключительной части обсуждаются преимущества внедрения цифровых технологий в учебный процесс и трудности, возникающие при их использовании, а также определяются основные направления формирования познавательных способностей учащихся. Используя программный интеллект, можно разрабатывать программные технологии, которые могут достичь уровня человеческого познания. Он предоставляет несколько аспектов своих способностей, позволяющих изменять мышление, принимать разные решения и создавать новые программы. С помощью биометрических технологий можно открыть новые возможности, позволяющие познанию людей выйти на новый уровень. Одна из важнейших потребностей – найти пути выхода на новый уровень знаний за счет использования цифровых технологий. Путем правильного и эффективного использования этих технологий можно достичь такого уровня знаний.

Ключевые слова: *цифровые навыки, информационные технологии, цифровые устройства, цифровая безопасность, цифровизация, электронное обучение, электронная библиотека*