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Using of virtual reality and artificial intelligence in education: literature review

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Abstract. Many individuals believe that new technology has been a transformative force in the field of education. Various technologies have been integrated into educational process in order to identify its capacity of enhancing student-learning experience. According to the newest studies, some recently developed technologies such as artificial intelligence (AI) and virtual reality (VR) have the potential to significantly improve teaching and learning processes. The article considers the relevance of using virtual reality and artificial intelligence resources in education. With the help of systematic literature review, this article provides a cumulative meta-analysis of works of a number of scholars who examined the influence of application of VR and AI on student learning experience. The authors found that the advantages of integrating these technologies into educational process are based on the increase in students' interests in the subject, the effectiveness in explaining complex topics, and the formation of a culture of openness to new technologies. The conclusions of the article contribute to the expansion of local academic understanding of this topic and are also useful for decision-makers in the field of secondary education and higher educational institutions which integrate educational technologies

Keywords: virtual reality, artificial intelligence, educational resources, educational process, educational technology.

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Introduction

This study analyses integration of new technologies, particularly Artificial intelligence (AI) and virtual reality (VR) into educational process. Artificial intelligence (AI) and virtual reality (VR) have the potential to significantly improve teaching and learning processes, according to recent studies of its application in education. Through immersive and interactive learning environments, virtual reality (VR) has been demonstrated to increase student engagement and provide a deeper understanding of difficult subjects. Many researchers believe that virtual reality (VR) has the potential to greatly enhance learning outcomes by rising students' concentration and strengthening their understanding of difficult ideas [1; 2]. However, results of other studies demonstrate that further research is necessary to completely understand the influence of VR on educational outcomes [3]. Artificial Intelligence in Education (AIED) is one of the hottest subjects that has been receiving rising interest of not only scholars but also professionals in other fields. Studies revealed that educational institutions have widely been adopting AI in many forms and for many purposes for at least three decades [4; 5; 6]. In this context, it would be useful to examine how these technologies changed learning process in order to find the most effective way of integration of educational technologies into classroom.

The aim of this paper is to analyse the advantages and disadvantages of Artificial intelligence (AI) and virtual reality (VR) application into educational system and its impact on teaching and learning process. The research objective is to evaluate studies implemented by several scholars that tested the implementation of VR and AI for educational and training purposes. The defined aim and objective are helpful in answering the question of what does the synthesized evidence tell about benefits of AI and VR in education. The findings of the paper are helpful for in-depth understanding of the issue and provide information for further investigations. The conclusions of the article contribute to the expansion of the local academic understanding of this topic, and are also useful for decision-makers in the field of secondary education and higher educational institutions that train teachers of computer science. The results of this study will be helpful for educators who wish to improve computer science instruction and better equip students for the demands of the future technological environment.

In-depth analysis of the current uses of AI and VR in education, a review of previous research on these topics, and suggestions for expanding the application of them in the educational field will all be discussed in the parts which follow. Next section describes the research strategy, data collection and analysis methods. This study utilized reviews of existing literature on this subject in order to demonstrate conceptual understandings of introducing AI and VR into education. The third section explains the findings of the study. In other words, this chapter presents the findings obtained from the data and the results of synthesis. The final section summarizes findings, suggests recommendations, and directions for future studies.

Research strategy and methods

This section discusses methods of data collection and analysis. This study utilized systematic literature review, whose procedure has been defined by many scholars [7; 8]. Since this review was not related to the health sphere, authors decided not to register the protocol of the process. For this purpose, the existing knowledge and academic debate on this topic were revised. The articles and works, including non-scientific ones, selected for this purpose were examined, their main conclusions were integrated. The article provides a review of domestic and foreign literature and doctoral dissertations to examine the possibilities of using virtual reality and artificial intelligence in the educational process. In this regard, articles published in journals indexed in the Web of Science Core Collection and Scopus databases, popular among international scientific community, were analyzed. Additionally, a research was conducted on doctoral dissertations dedicated to the use

of virtual reality and artificial intelligence in education. During this process, local dissertations, stored in the catalogues of the National Academic Library of the Republic of Kazakhstan, the National State Scientific and Expert Center, were considered.

The selection of relevant papers for examination in the review section was conducted in three stages. First, abstracts from all the listed publications, the years of publication and citations were revised in order to determine the significance of the article for study. In cases of abstracts being non-relevant, they were excluded. In addition, the second stage considers the credibility of publishers, institutions and the background information about the authors. Finally, some publications were rejected after having been read almost fully in cases when the section of publications was not completely related to the topic of the article. The following criteria were established for inclusion of publications for review:

1. They are relevant to the subject and research questions of this study
2. There were seminal, empirical studies that were peer-reviewed
3. Their citation index was also reviewed
4. They accord with the accepted standards of scientific publications
5. For non-empirical publications, the credibility of institutions, companies, publishers was considered

These criteria allowed to sift out redundant literature and consider the most relevant studies, which are explicitly discussed in next subsection.

Summary of Literature Review

Virtual reality is being implemented in various spheres of human life, including education. It is said that VR in education is beneficial because it facilitates the assimilation of complex information, provides students with hands-on experience, increases students' attention in lessons, and increases interest and motivation in classroom. Thanks to these advantages, learning through virtual reality will become an educational instrument in the 21st century [9]. In recent years, VR technology has become more accessible as its cost has decreased, and various modeling platforms, such as Unity and varwin, have become available allowing users to create virtual environments easily. This means that the application of VR will expand.

The rising body of scientific research on the use of virtual reality (VR) technologies in education in recent years highlights the field's increasing importance. Numerous research have examined how virtual reality affects students' educational experience and indicated some of the possible advantages. The important conclusions from a few chosen studies are presented in the table below, which highlights several facets of the usefulness of virtual reality in learning environments (Table 1). The data from multiple researchers summarized in this table shows the extent of influence of VR in various educational environments. These studies were chosen because they were relevant to the use of virtual reality (VR) to improve learning outcomes. By putting these ideas out there, we hope to draw attention to the various ways in which virtual reality technology is being applied to enhance education as well as point out to the areas that require more study in order to grasp its potential advantages and drawbacks properly.

Table 1. Studies on the possibilities of using virtual reality technology.

№	Researchers	Concept
1.	Calvert J., & Abadia R	They proved positive influence on perception skills, participation, emotions, and empathy [10].

№	Researchers	Concept
2.	McGovern E., Moreira G. & Luna-Nevarez C.	They noted that VR technologies improve students' presentation skills [11].
3.	Bogusevschi D., Muntean C. & Muntean G. M.	The experiment conducted among young students showed that the use of VR makes the learning process more interesting [12].
4.	Hodgson P., et al.	They showed that VR enhances students' understanding of subjects and increases satisfaction with learning [13].
5.	Krokos E., et al.	They stated that students acquire more information and enhance their practical skills [14].
6.	Soliman, M., et al.	They identified usefulness of VR in engineering education for better subject comprehension and reduced experiment time [15].
7.	Parmaxi, A.	The assistance provided by this tool in language classes has been described as invaluable [16].
8.	Zhao, G., et al.	The systematic literature on medical research has also shown that students in the VR group demonstrated better results than students in the traditional education group [17].
9.	Hamilton, D., et al.	Systematic literature review concluded that VR is generally beneficial, though a few studies reported negligible effects. One of the greatest advantages of virtual reality in education and learning is that it allows students to perform complex and dangerous tasks in a safe environment [18].
10.	Ahir, K., et al.	VR is often used for educational purposes in such areas as medicine, sports, and military training [19].
11.	Kornılov Iy.V., Mykasheva M.Y., Sarsımbaeva S.M.	The issues of optimal student learning using virtual reality technologies have been studied [20].
12.	Sadvakassova A.K., Kydyrbekova A.I.	The digital educational resources developed for the effective integration of virtual reality were tested at a specialized gymnasium №81 Astana English school in Astana [21].
13.	Shadiev R. et al.	The use of eye-tracking technology in an immersive virtual reality learning environment [22], the development of creative abilities of high school students in an educational project based on virtual reality technology [23], and the promotion of informational literacy and intercultural competence through industrial educational activity VR Tour [24] were intensively studied.

In general, the benefits of virtual reality in learning are based on increasing student motivation, understanding complex and abstract subjects as well as reducing costs of laboratory work and ensuring teacher safety.

A literature review shows that many publications are dedicated to the use of virtual reality in higher education, while there are few studies on the benefits of virtual reality in secondary education. However, the number of doctoral dissertations on this topic is quite small, including few local studies.

More specifically, the use of virtual reality resources in secondary education is not fully understood to the date. Additionally, many studies have focused on evaluating students' VR experiences, while only a few studies have examined the impact of this technology on academic performance. As a result, the impact of virtual reality educational resources on the behavior and learning of secondary school students remains studied insufficiently. Furthermore, many experiments have been short-term, resulting in insufficient data collection and failure to assess the long-term impact of

virtual reality resources on students.

Despite being widely familiar to general public, artificial intelligence has recently been tested in education. According to Ido Roll and Ruth Wylie, utilization of AIED for educational purposes has undergone significant developments since 1990s [25]. In other words, the potential applications of artificial intelligence are expanding every year, bringing big changes to various fields. Many industries, including finance, aerospace, medicine, law, transportation, and agriculture, are using this technology and achieving success. It is evident that one of these fields can be education as a range of innovations complements this field. However, it is often said that additional research on the application of artificial intelligence in this field is still necessary. Therefore, a number of researchers in their works have expressed various views on this matter (see Table 2):

In order to give a thorough picture of the numerous ways in which AI is being applied in education, the papers mentioned in Table 2 were chosen based on a set of criteria. The publications were selected for the reason of addressing important issues in education, making creative use of artificial intelligence, and having useful consequences for both educators and learners. Additionally, a variety of viewpoints which address a range of topics including infrastructure development, student involvement, teacher assistance, and adaptive learning were taken into consideration while choosing these studies.

Table 2. Studies on the possibilities of using artificial intelligence technology.

№	Researchers	Concept
1.	B. Coppin	Artificial intelligence (AI) is the ability of machines to adapt to new environments, learn, and make decisions, find solutions to problems, and perform various functions that require human intelligence [26].
2.	Roll, I., & Wylie, R.	AI offers numerous opportunities for education. We need to diversify AI. It is clearly stated that artificial intelligence should be better integrated into teachers' practices, existing resources as well as the everyday lives and tasks of students [25]. It is worth noting that the comprehensive use of artificial intelligence and its integrated application to other digital technologies is important
3.	Al-haimi B. et al.	Artificial intelligence helps students adapt to new paradigmatic learning systems, namely blended learning, location-independent and time-independent learning, and flexible learning [27]. Thus, artificial intelligence tools optimize the responsibilities of the teacher.
4.	Thuong TK., et al.	There are numerous applications of AI in education. Analyzing artificial intelligence will be necessary in teachers' practice, in educational institutions, and in the development of certain educational programs [28]. Moreover, this technology helps teachers, students, and school administrators develop teaching and learning strategies.
5.	Kabudi, et al.	This study noted that the aspects of learning using artificial intelligence, such as adaptive hypermedia, information filtering, classroom monitoring, and collaborative learning, contribute to student engagement, interaction, and learning [29]. Thus, it can be specified that blending AI functionalities in teaching positively influences the quality of education.

№	Researchers	Concept
6.	Timms, M.J.	The use of artificial intelligence in education contributes to the improvement of the quality of education. Delegating additional teacher workload to artificial intelligence technologies leads to the competent use of educational technologies and modeling of teaching methods [30]. It can be concluded that further expansion in this direction will lead to the further development of this field.
7.	Serik M, et al.	In the works of researchers, it was noted that the level of creative thinking and practical skills of students increases during practical work with the help of artificial intelligence and neural networks [31]. This study demonstrates that the use of artificial intelligence by children enhances their interest and activity in the classroom.
8.	Mukhamediyeva K.M., et al.	During the study, the authors concluded that the use of elements of artificial intelligence in STEM teachers training field provides effective opportunities [32]. Overall, researchers explained that the use of artificial intelligence technologies, especially in STEM subjects, will open up new opportunities and change traditional teaching methods.
9.	Kerımberdina A.B., et al.	The problems encountered in the process of improvement of the training of future computer science teachers in creating artificial neural networks have been studied [33], and the conclusion that the use of AI capabilities in research yields positive results was drawn.
10.	Ma J. et al.	The authors conducted a school course on artificial intelligence called “Challenging Tic-Tac-Toe” [34]. As a result, it was shown that game-based learning in artificial intelligence courses helps students acquire knowledge in the field of AI, improve computational thinking skills, increase interest in learning, motivation, self-confidence and also reduce cognitive load.
11.	Buribayev Zh.A.	In robotics, a model of a robot that recognizes and collects objects was built using machine learning methods based on neural networks. We see that the search engine experimented with the capabilities of artificial intelligence [35].
12.	Islamgojayev T.U.	A model of a device for efficient spraying of liquid medications in windy conditions based on elements of artificial intelligence was created. As a result, the flight of an unmanned quadcopter in windy conditions was implemented using elements of artificial intelligence [36].

Overall, the long-term impact of this new tool on educational process, and the question of studying the advantages of its integration into the sphere of education remains relevant for all types of technologies. Since long-term studies require significant resources, many researchers limit themselves to short-term impact studies and evaluate the impact of technologies on education approximately. This trend is evident in research on the impact of artificial intelligence on the educational sector, which has rapidly been evolving in recent years.

Concluding discussions

The world of today is changing quickly, with new technologies rapidly emerging and the economic and demographic landscape changing as well, and educational institutions play essential role in helping students become globally competitive. In order to accomplish this role, educational systems need to take the lead in advancing new technology as well as adapting to current technological developments. To create workforce skilled and qualified for

the demands of the modern labor market, educational processes must use cutting-edge technology like virtual reality (VR) and artificial intelligence (AI).

The examination of educational materials about using virtual reality (VR) and artificial intelligence (AI) in the literature review reveals multiple noteworthy effects on the process of learning. It was demonstrated that these technologies increase student engagement, facilitate better understanding of new material, encourage long-term memory retention, and aid in the development of digital technology skills. Research continuously highlights the useful advantages of integrating AI and VR into the classroom as showcased by students' increased interest and enhanced practical effectiveness in the topics where these technologies were applied.

The research also highlights the fact that although VR and AI have demonstrated the potential to improve learning outcomes, teachers' ability to fully employ these technologies is still lacking in certain areas. Numerous studies highlight the necessity of further integration of these technologies into current teaching methods and materials, emphasizing that the effective use of AI and VR in the classroom does not only depend on technical improvements but also on teachers' awareness of the ways of AI and VR application.

Overall, findings of the examined studies show that, although being in early phases of their development, AI and VR have a promising future in education. It has been demonstrated that these tools increase students' curiosity and help them understand new information. Aiding educators with the tools and resources necessary to effectively incorporate AI and VR into their lesson plans is still a big challenge. This emphasizes the need of further research and practical implementations to deal with these issues and completely realize the educational potential of these technologies.

References

1. **Checa D., Bustillo A.** A review of immersive virtual reality serious games to enhance learning and training //Multimedia Tools and Applications. – 2020. – Т. 79. – №. 9. – С. 5501-5527.
2. **Zhou Y.** et al. Promoting knowledge construction: A model for using virtual reality interaction to enhance learning //Procedia computer science. – 2018. – Т. 130. – С. 239-246.
3. **Coban M., Bolat Y. I., Goksu I.** The potential of immersive virtual reality to enhance learning: A meta-analysis //Educational Research Review. – 2022. – Т. 36. – С. 100452.
4. **Chen L., Chen P., Lin Z.** Artificial intelligence in education: A review //Ieee Access. – 2020. – Т. 8. – С. 75264-75278.
5. **Roll I., Wylie R.** Evolution and revolution in artificial intelligence in education //International journal of artificial intelligence in education. – 2016. – Т. 26. – С. 582-599.
6. **Chen X.** et al. Two decades of artificial intelligence in education //Educational Technology & Society. – 2022. – Т. 25. – №. 1. – С. 28-47.
7. **Lame G.** Systematic literature reviews: An introduction //Proceedings of the design society: international conference on engineering design. – Cambridge University Press, 2019. – Т. 1. – №. 1. – С. 1633-1642;
8. **Nightingale A.** A guide to systematic literature reviews //Surgery (Oxford). – 2009. – Т. 27. – №. 9. – С. 381-384.
9. **Rogers, S.** Virtual Reality: The learning aid of the 21st century. // Forbes . (2019). [Electronic resource]. URL: https://www.forbes.com/sites/solrogers/2019/03/15/virtual-reality-the-learning-aid-of-the-21st-century/#7b5ad441139b (Accessed 09.01.2024).
10. **Calvert J., Abadia R.** Impact of immersing university and high school students in educational linear narratives using virtual reality technology // Computers & Education. – 2020. – Т. 159. – С. 104005.
11. **McGovern E., Moreira G., Luna-Nevarez C.** An application of virtual reality in education: Can this technology enhance the quality of students' learning experience? //Journal of education for business. – 2020. – Т. 95. – №. 7. – С. 490-496.
12. **Bogusevschi D., Muntean C., Muntean G. M.** Teaching and learning physics using 3D virtual learning environment: A case study of combined virtual reality and virtual laboratory in secondary school //Journal of Computers in Mathematics and Science Teaching. – 2020. – Т. 39. – №. 1. – С. 5-18.
13. **Hodgson P.** et al. Immersive virtual reality (IVR) in higher education: Development and implementation //Augmented reality and virtual reality: The power of AR and VR for business. – 2019. – С. 161-173.
14. **Krokos E., Plaisant C., Varshney A.** Virtual memory palaces: immersion aids recall //Virtual reality. – 2019. – Т. 23. – №. 1. – С. 1-15.

15. **Soliman M.** et al. The application of virtual reality in engineering education //Applied Sciences. – 2021. – Т. 11. – №. 6. – С. 2879.

16. **Parmaxi A.** Virtual reality in language learning: A systematic review and implications for research and practice //Interactive learning environments. – 2023. – Т. 31. – №. 1. – С. 172-184.

17. **Zhao G.** et al. The comparison of teaching efficiency between virtual reality and traditional education in medical education: a systematic review and meta-analysis //Annals of translational medicine. – 2021. – Т. 9. – №. 3.

18. **Hamilton D.** et al. Immersive virtual reality as a pedagogical tool in education: a systematic literature review of quantitative learning outcomes and experimental design //Journal of Computers in Education. – 2021. – Т. 8. – №. 1. – С. 1-32.

19. **Ahir K.** et al. Application on virtual reality for enhanced education learning, military training and sports //Augmented Human Research. – 2020. – Т. 5. – С. 1-9.

20. **Kornilov, YU. V., Mukasheva, M. U., & Sarsimbaeva, S. M.** Primenenie tekhnologij virtual'noj real'nosti v izuchenii razlichnyh predmetov: obzor nauchnoj literatury. Vestnik Severo-Vostochnogo federal'nogo universiteta im. MK Ammosova. Seriya: Pedagogika. Psihologiya. Filosofiya. – 2022. – №. 2 (26). – С. 5-15.

21. **Sadvakasova A.K., Kydyrbekova A.I.** Virtualdy şyndyq tehnologiasyn orta mekteptiñ bılım beru ürdısında qoldanu// L.N. Gumilev atyndağy Eurazia ūlttyq universitetiniñ HABARŞYSY, Pedagogika. Psihologia. Äleumettanu seriasy. - 2021. -№4(137), 310-319.

22. **Shadiev R., Li D.** A review study on eye-tracking technology usage in immersive virtual reality learning environments //Computers & education. – 2023. – Т. 196. – С. 104681.

23. **Shadiev R.** et al. Cultivating Creativity of High School Students in Cross-Cultural Learning Project Based on VR Technology //International Conference on Innovative Technologies and Learning. – Cham : Springer Nature Switzerland, 2023. – С. 463-472.

24. **Shadiev R.** et al. Facilitating information literacy and intercultural competence development through the VR Tour production learning activity //Educational technology research and development. – 2023. – Т. 71. – №. 6. – С. 2507-2537.

25. **Roll I., Wylie R.** Evolution and revolution in artificial intelligence in education //International journal of artificial intelligence in education. – 2016. – Т. 26. – С. 582-599.

26. **Coppin B.** Artificial intelligence illuminated. – Jones & Bartlett Learning, 2004.

27. **Al-haimi B.** et al. Higher education institutions with artificial intelligence: roles, promises, and requirements //Applications of artificial intelligence in business, education and healthcare. – 2021. – С. 221-238.

28. **Thuong TK. Nguyen, Minh T. Nguyen, Hoang T.** Tran. Artificial intelligent based teaching and learning approaches: A comprehensive review. // International Journal of Evaluation and Research in Education. – 2023. – N 12(4), 2387-2400.

29. **Kabudi T., Pappas I., Olsen D. H.** AI-enabled adaptive learning systems: A systematic mapping of the literature //Computers and Education: Artificial Intelligence. – 2021. – Т. 2. – С. 100017.

30. **Timms M. J.** Letting artificial intelligence in education out of the box: educational cobots and smart classrooms // International Journal of Artificial Intelligence in Education. – 2016. – Т. 26. – С. 701-712.

31. **Serik M., Nurgaliyeva S., Balgozhina G.** Introducing robotics with computer neural network technologies to increase the interest and inventiveness of students //World Trans. on Engng. and Technol. Educ. – 2022. – Т. 20. – №. 1. – С. 33-38.

32. **Muhamedieva K.M., Nurgazinova G.SH., Abykenova D.B., Abisheva I.SH., Kopeev ZH.B.** Realizaciya iskusstvennogo intellekta v obrazovanii cherez razrabotku stem proektov. // Bulletin the National academy of sciences of the Republic of Kazakhstan. – 2023. - №5 (405). – С. 190-204.

33. **Kerımberdina A.B., Sadvakasova A.K., Abdulgalimov G.L.** Bolaşaq informatika pedagogtaryn jasandy neirondyq jelılerge oqytudyñ negızgı ädısterı // QR Ūlttyq ğylym akademiasynyñ habarşysy. - 2022. -№4(398). - С. 107-119.

34. **Ma J.** et al. The Development of Students' Computational Thinking Practices in AI Course Using the Game-Based Learning: A Case Study //2022 International Symposium on Educational Technology (ISET). – IEEE, 2022. – С. 273-277.

35. **Buribaev Zh.A.** Razrabotka effektivnyh parallel'nyh algoritmov mashinnogo obucheniya dlya sistemy orientacii robota v prostranstve. [Doctor's Thesis Project, Al-Farabi Kazakh National University]. - 2022.

36. **Islamgojayev T.U.** Baskaru men bagdardy quru algoritmderin koldana otyryp derbes mobil'di robotty baskaratyn zhasandy intellekt elementteri bar zhuieni qurastyru. [Doctor's Thesis Project, Al-Farabi Kazakh National **University]. -2017.**

Виртуалды шынайылық пен жасанды интеллектіні білім беруде қолдану: әдеби шолу

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Аңдатпа. Көпшілік жаңа технологиялар білім беруді өзгертуші күшке айналды деп санайды. Оқушылардың оқу тәжірибесін жақсарту мүмкіндіктерін анықтау мақсатында оқу процесіне әртүрлі технологиялар кіріктірілді. Соңғы зерттеулерге сәйкес, жасанды интеллект (AI) және виртуалды шындық (VR) сияқты жаңадан әзірленген кейбір технологиялар оқыту мен оқу процестерін айтарлықтай жақсартуға мүмкіндік береді. Мақалада білім беруде виртуалды шындық пен жасанды интеллект ресурстарын пайдаланудың өзектілігі талқыланады. Жүйелі әдебиеттерді шолуды пайдалана отырып, бұл мақалада VR және AI қосымшаларының студенттердің оқу тәжірибесіне әсерін зерттеген бірқатар ғалымдардың жұмысының жинақталған мета-талдауы ұсынылған. Авторлар бұл технологияларды оқу үдерісіне енгізудің артықшылықтары оқушылардың пәнге деген қызығушылығын арттыруға, күрделі тақырыптарды тиімді түсіндіруге, жаңа технологияларға ашықтық мәдениетін қалыптастыруға негізделгенін анықтады. Мақаланың қорытындылары осы тақырып бойынша жергілікті академиялық түсінікті кеңейтуге ықпал етеді және сонымен қатар білім беру технологияларын біріктіретін орта білім мен жоғары оқу орындарындағы шешім қабылдаушылар үшін пайдалы.

Түйін сөздер: виртуалды шынайылық, жасанды интеллект, білім беру ресурстары, оқу үдерісі, білім беру технологиясы

Применение виртуальной реальности и искусственного интеллекта в образовании: обзор литературы

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Аннотация. Многие считают, что новые технологии стали преобразующей силой в сфере образования. Различные технологии были интегрированы в образовательный процесс с целью выявления их способности улучшать опыт обучения студентов. Согласно новейшим исследованиям, некоторые недавно разработанные технологии, такие как искусственный интеллект (ИИ) и виртуальная реальность (ВР), обладают потенциалом для значительного улучшения процессов преподавания и обучения. В статье рассматривается актуальность использования ресурсов виртуальной реальности и искусственного интеллекта в образовании. С помощью систематического обзора литературы в этой статье представлен кумулятивный метаанализ работ ряда ученых, которые исследовали влияние применения ВР и ИИ на опыт обучения студентов. Авторы обнаружили, что преимущества интеграции этих технологий в образовательный процесс основаны на повышении интереса студентов к предмету, эффективности объяснения сложных тем и формировании культуры открытости к новым технологиям. Выводы статьи способствуют расширению локального академического понимания этой темы, а также полезны для лиц, принимающих решения в области среднего образования и высших учебных заведений, которые интегрируют образовательные технологии.

Ключевые слова: виртуальная реальность, искусственный интеллект, образовательные ресурсы, образовательный процесс, образовательные технологии.

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