The Impact of Technological Progress on How We Learn

Matygov Movsar Musaevich[1][a], Mashukov Khyzyr Vyacheslavovich[2][b] and Amina Shaukatovna Khafizova [3][c]

[1]*Kadyrov Chechen State University, Grozny, Russia*

[2]*Kabardino-Balkarian State University, Nalchik, Russia*

[3]*Department of Computer Systems, Kazan National Research Technical University named after A. N. Tupolev-KAI, Kazan, Russia*

matygov.movsar@gmail.com, khiz@kbsu.ru, aminahafizova@yandex.ru

Keywords: technological, Progress, Education, Online, Learning platforms, Artificial intelligence, Virtual and augmented reality.

Abstract: This work examines how technology is changing education and shaping the future of learning. The integration of technology in education has opened up a plethora of opportunities and possibilities, and this work discusses some of the key technologies that are transforming the education sector, such as online learning platforms, virtual and augmented reality, artificial intelligence, and gamification. The work highlights how these technologies are making education more accessible, engaging, and personalized, ultimately leading to better retention of knowledge and skills.

1 INTRODUCTION

In today's rapidly changing world, we are confronted with numerous challenges that demand us to embrace new realities and utilize the available tools to reach our full potential. Had we failed to adopt progress in what we were doing, we would still be living in an era where humans would not have evolved much from animals. However, progress never stops, and we are living in an age of technological advancement that is growing at an unprecedented rate. It can be a daunting task to keep up with the latest technologies that are introduced into the market on a daily basis. While some of these technologies may have a minor impact on the overall world, there are others that are transformative and have the potential to reshape the world in unimaginable ways. These technologies need to be studied, understood and embedded into different sectors to extract their full potential and improve them for more convenient and efficient use.

It is a well-known fact that some sectors are quicker than others to adopt new technologies and innovative approaches. For example, corporate sectors are typically focused on maximizing their production rates and minimizing the cost of production by any means necessary, which requires them to quickly embrace new technologies. On the other hand, sectors such as education are often more conservative and tend to stick to traditional methods of teaching. While it doesn't mean that they don't integrate new technologies, it may take them longer to fully adopt them. Furthermore, not all technologies are suited to every sector, and it's essential to identify and incorporate the ones that are best suited to the desired area and can be used to reshape it in a better way.

This work will examine the impact of technological progress on education and how it is shaping our future in the context of learning. Education is one of the most valuable assets that we have for a brighter future. It shapes individuals and develops the necessary skills to function effectively in modern society. Education not only shapes individuals but also the entire nation, and therefore, it is vital to keep up with the changing educational methods to adapt to the new realities. The integration of technology in education has opened up a plethora of opportunities and possibilities, and it is essential to

[a] https://orcid.org/0000-0003-4670-3724
[b] https://orcid.org/0009-0000-4012-2270
[c] https://orcid.org/0009-0008-3803-3613

embrace them to maximize the potential and further improve the sector (Alam, 2022).

2 TECHNOLOGIES THAT ARE RESPONSIBLE FOR SHIFTS IN EDUCATION SYSTEM

The following paragraph will cover the technologies that are shaping education in general. These technologies are drastically affecting well-established traditional methods. Below are some of the key technologies that have transformed and continue to transform the education sector: online learning platforms, virtual and augmented reality, artificial Intelligence and gamification.

2.1 Online Learning Platforms

Over the centuries, the education system has undergone gradual improvement without experiencing dramatic changes. However, with the latest technologies and challenges, education is undergoing a new wave of renovation. Online learning platforms have been in progress for many years, but it was not until the outbreak of Covid-19 that their full potential was realized.

These learning platforms are designed to provide access to education to those who are unable to attend traditional classes due to various circumstances, making it more accessible and convenient. They eliminate the distance barrier by allowing any student to experience the full potential of traditional methods without physically going anywhere. As a result, students from all around the world can access quality education from anywhere and at any time.

Furthermore, online learning platforms provide a flexible learning environment that enables students to learn at their own pace, which is particularly useful for those who have busy schedules or work commitments. This approach to learning allows students to learn at a speed that suits them best and gives them greater control over their learning experience (Abuhassna, 2020; Magomedov, 2020).

2.2 Virtual and Augmented Reality

The first thing that these technologies do is add more colors to the monotonous and boring classes. They can deliver complex topics in a better way with the aid of visualization. While old ways of delivery, like videos, also include visualization, these new technologies expand the space to digest information in a more convenient and entertaining manner. This is especially important in today's world, where attention spans are shorter, and students are more likely to engage with content that is presented in an engaging and interactive way (Wilson, Soranzo, 2015).

Moreover, these technologies eliminate circumstances where dangerous and hazardous experiments are in metaverse, but with the realness is in charge. In other words, these technologies allow students to experience realistic laboratory simulations without any risk to themselves or the environment. Furthermore, they save space as laboratories can be viewed and manipulated through one small device, where every student can have its own big lab. This not only reduces the cost of building and maintaining physical laboratories but also makes the learning experience more personalized and interactive (Gudoniene, Rutkauskiene, 2019; Magomedov, Dzhabrailov, Bagov, 2022).

In addition, virtual and augmented reality technologies allow for more immersion in online learning platforms. These technologies create a more realistic and interactive environment for students, enabling them to interact with complex concepts and theories in a way that was previously impossible. With virtual and augmented reality technologies, students can explore 3D models of complex systems, visit historical sites, and even participate in simulated field trips. This makes the learning experience more engaging and memorable for students, leading to better retention of knowledge and skills (Gerasimov, Nuriev, Gashigullin, 2022).

2.3 Artificial Intelligence

One of the main advantages of AI in education is its ability to personalize learning. One may recall from their school or higher education classes that some students grasped certain topics better than others, even though they were all taught by the same teacher at the same time, using the same method of delivery. This can be attributed to the fact that everyone's learning style is unique, and with a specific approach, information can be presented in a way that is easily understandable. AI's personalized way of interaction can enrich learning abilities by morphing with the person and knowing exactly what they want. With its advanced natural language processing capabilities, AI can adapt to each student's learning style and pace, providing tailored support and feedback that meets their individual needs. This personalized approach can help students build confidence, stay motivated, and achieve success in their studies. Through its interactive exercises, games, and customized learning materials, AI can create a rich and engaging learning experience that goes beyond traditional classroom instruction (Chang,, Lu, 2019).

AI can greatly assist teachers by automating many tasks such as grading exams and tracking students' progress. With its ability to analyze data and identify areas where students may be struggling, AI can help teachers provide personalized support and tailored feedback to meet the individual needs of each student. This can be particularly useful in identifying and addressing learning gaps, which can be a challenge in traditional classroom settings (Cherny, Gibadullin, 2022).

Moreover, AI can also automate administrative tasks such as scheduling, record-keeping, and communication with parents, freeing up more time for teachers to focus on teaching and working directly with students. By streamlining administrative tasks, teachers can more efficiently manage their workload and spend more time on high-impact activities such as lesson planning and instructional design.

2.4 Gamification

Gamification applies game-like mechanics to non-game contexts, enhancing engagement, motivation, and learning outcomes. It creates an enjoyable, playful environment that promotes persistence, problem-solving, and creativity. Rewards for effort and progress foster a growth mindset, while collaborative play cultivates social interaction and peer learning. Gamification can effectively engage students and promote learning, but it's important to ensure the game elements are well-designed and meaningful (Rincon-Flores, Mena, López-Camacho, 2022).

3 CHALLENGES MET BY THE INTRODUCTION OF THESE TECHNOLOGIES

New technologies mean new workforce and new unpredictable threats. Workers needs to scope with the new technologies otherwise they are at risk slowly cutting their ties with introduced sector, in this example it is educational system or even loosing job. Therefore, technology introduction will displace some jobs and similarly introduce too. With the traditional method almost, every possible threat is studied and overall the safety mechanisms are built. Whereas with the new technology it is impossible immediately to guess all the potential risk it will provide. Henceforth, one must be aware that introduction of these technologies will not be that simple (Magomedov, Murzaev, Zolkin, 2020).

4 DISCUSSION

New technologies are rapidly spreading across various sectors and are proving to have a positive impact when used correctly. In particular, the technologies discussed above are transforming the traditional education system into a more promising form that not only changes the way knowledge is imparted but also the amount of knowledge that learners can acquire. These technologies are all part of the same family and have emerged due to the development and improvement of information and communication systems. As these technologies continue to improve, they will open up new possibilities and be increasingly utilized in the field of education. Additionally, there will likely be other emerging technologies that will also shape and influence the educational system, similar to the technologies discussed above.

5 CONCLUSIONS

The following work discusses how technology is revolutionizing education and its impact on learning. It emphasizes the need for different sectors to adopt new technologies to reach their full potential and improve convenience and efficiency. The work then examines the impact of technological progress on education, discussing the technologies responsible for shifts in the education system. It also highlights online learning platforms, virtual and augmented reality, artificial intelligence and gamification as key technologies that are transforming the education sector. It emphasizes the potential of these technologies to improve accessibility, provide flexible learning environments, enhance engagement and retention of knowledge, and personalize learning experiences. The work concludes that technology has the potential to reshape the education sector in unimaginable ways and encourages the integration of technology into education to maximize its full potential.

REFERENCES

Alam, A., 2022. Platform Utilising Blockchain Technology for eLearning and Online Education for Open Sharing of Academic Proficiency and Progress Records. Smart Data Intelligence: Proceedings of ICSMDI 2022. Singapore: Springer Nature Singapore, 307-320

Abuhassna, H., et al., 2020. Development of a new model on utilizing online learning platforms to improve students' academic achievements and satisfaction. *International Journal of Educational Technology in Higher Education.* T. 17. pages 1-23.

Magomedov, I. A., et al., 2020. J. Phys.: Conf. Ser. 1691 012134.

Wilson, C.J., Soranzo, A., 2015. The Use of Virtual Reality in Psychology: A Case Study in Visual Perception. Computational and Mathematical Methods in Medicine.

Gudoniene, D., Rutkauskiene, D., 2019. Virtual and Augmented Reality in Education. *Balt. J. Mod. Comput.*, 7.

Magomedov, I. A., Dzhabrailov, Z. A., Bagov, A. M., 2022. Blockchain technology and its common threats. *AIP Conference Proceedings*, 1, 2647 (1): 040096.

Gerasimov, V. A., Nuriev, M. G., Gashigullin, D. A., 2022. International Russian Automation Conference (RusAutoCon), pp. 75-79.

Chang, J., Lu, X., 2019. The Study on Students' Participation in Personalized Learning Under the Background of Artificial Intelligence. 2019 10th International Conference on Information Technology in Medicine and Education (ITME), Qingdao, China, pp. 555-558.

Cherny, S. N., Gibadullin, R. F., 2022. The Recognition of Handwritten Digits Using Neural Network Technology. 2022 International Conference on Industrial Engineering, Applications and Manufacturing (ICIEAM), Sochi, Russian Federation, pp. 965-970.

Rincon-Flores, E.G., Mena, J., López-Camacho, E., 2022. Gamification as a Teaching Method to Improve Performance and Motivation in Tertiary Education during COVID-19: A Research Study from Mexico. Educ. Sci, 12, 49

Magomedov, I. A., Murzaev, H. A., Zolkin, A. L., 2020. Cyber Literacy As One Of The Main Discipline Necessary In Modern Time. Economic and Social Trends for Sustainability of Modern Society (ICEST 2020), vol 90. European Proceedings of Social and Behavioural Sciences. pp. 1011-1015.