



OPINIONS OF HIGH SCHOOL TEACHERS IN UZBEKISTAN ABOUT THE ROLE OF DIGITAL TECHNOLOGIES IN ENHANCING STUDENTS' CREATIVITY.

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Abstract

It has become crucial to use technology in every aspect of human life, including education, as a result of its growing significance in today's world. Likewise, the importance of creativity in education is also increasing. This study examined Uzbek high school teachers' opinions on how technology might foster creativity during classes. Data was collected through quantitative methods (questionnaire) from 35 high school teachers. According to the results, teachers generally have a fairly positive attitude toward employing technology in the classroom. They have also shown a solid understanding of creativity. The additional opportunities given by digital technology and its efficiency were mentioned by teachers as the primary reasons why they thought technology might increase creativity. The findings, however, indicated an average understanding of virtual reality and its advantages. This survey found that most teachers are ready to incorporate digital technology into the classroom to develop students' creativity and have positive opinions about it.

Keywords: creativity, digital technology, teachers, classroom, virtual reality Introduction

Due to the tremendous economic, societal, and individual benefits, fostering young people's creativity has recently become a major educational objective around the world (Vincent-Lancrin et al., 2019). It has been proposed that digital technology



can significantly contribute to promoting students' creativity by offering new resources and settings for both learning to be creative and learning via being creative (Glăveanu et al., 2019). According to Cachia and Ferrari (2010), teachers in numerous nations likewise concur with the idea that technology may enhance creativity. Also, most experts agree that teachers' perceptions of creativity influence how they engage in the development of students' creative abilities (Skiba et al., 2017). Yet, the perspectives of Uzbek high school teachers on creativity, technology, and education remain to be investigated.

Teachers in Uzbekistan also implement various techniques that develop creativity in their students. However, due to limited digital skills, they might be skeptical about the role of technology in enhancing creativity.

Therefore, the study's primary goal was to better understand high school teachers' attitudes toward encouraging creativity through digital technology in Uzbekistan. We surveyed high school teachers in Tashkent and received 35 responses. The next sections of this study will include a review of the literature, methods, results, discussion, conclusion, and recommendations.

Literature Review

Introduction

There has only been a limited amount of research that have looked at how technology-based learning affect creativity, according to the results of both prior and more contemporary reviews and meta-analyses (Valgeirsdottir and Onarheim, 2017). Prior research has provided useful insights into how educators understand creativity, their perceptions of creative learners and educators, and their viewpoints on the aspects of learning environments that foster creativity (Bereczki and Kárpáti, 2018). Finally, the results of both subject-specific and cross-disciplinary examinations in the area of creativity have offered information about teachers' mindsets and actions (Mullet et al., 2016).

Digital technology's capacity to stimulate creativity

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According to Glăveanu et al. (2019), several studies that have been published have speculated on how digital technology might promote creativity and academic achievement. Kuo et al. (2014) state that in comparison to conventional training, domain-specific technology-based creative problem-solving programs have been found to significantly boost students' creative ability. Research on the benefits of using digital tools for creation on students' creativity found that the use of 3D design programs improved the creative performance of high school students in design and engineering (Chang et al., 2019). Moreover, (Chen and Chiu, 2016) show that students' creative performance in design has enhanced as a result of teamwork and competitiveness in electronic environments.

Teachers' beliefs about technology enhanced creativity

The ways that teachers encourage students' creative abilities in the classroom are influenced by their epistemic views about creativity (Skiba et al., 2017). According to Adams (2013), research examining teachers' attitudes on using technology to stimulate creativity have revealed that teachers may take a variety of positions regarding the significance of technology in encouraging creativity, which is seen as both an amplifier of and a hindrance to students' creative development. In these research, it was claimed that technology increased students' curiosity and interest, which are essential for creativity in the classroom (Alsahou, 2015). At the same time teachers noted disruption and the silencing of thinking by having access to pre-made answers as negative effects of technology on creativity (Scott, 2015).

Developing creativity through virtual reality (hereafter VR)

Alahuhta et al. (2014) state that it has long been necessary to employ VR to increase creativity, but there have recently been numerous worries about it. Also, Bereczki and Karpati (2021) believe that existing research emphasizes the unique role VR environments could play in promoting and developing creativity by enabling users to experience situations that stimulate creativity. In particular, it was discovered that employing creative avatars and providing users with unique chances to approach issues from different angles could increase creativity (Yang et al., 2018). According to Lu et



al. (2014), much effort has gone into developing methods for incorporating VR into the classroom in order to foster professional growth and creative thinking. Thornhill-Miller and Dupont (2016) state that VR can improve traditional learning because it can replicate a real-world that is difficult to construct in the physical world.

Conclusion

Overall, studies have demonstrated that technology can boost creativity, and virtual reality could potentially be a major factor in this. Consequently, most teachers believe technology may foster creativity, although there may be some drawbacks. Current research is different from those done before, because in the previous studies, only expert teachers' opinions about the impact of technology on creativity have been gathered, leaving out the perspectives of ordinary teachers.

Methods

This section includes details about research participants, the data collection process, and ethical issues.

This study used the following research question to explore the topic: *What are the opinions of high school teachers in Uzbekistan about the role of digital technologies in enhancing students' creativity?*

The participants of the study were 35 high school teachers from local schools. 25.7% of them were male, and 74.3% of them were female (See Appendix A, figure 1). Teachers' job experience ranged from one to ten and more years, with 28.6% of them teaching math, 14.3% teaching English, 2.9% teaching the arts, and 54.3% teaching science (See Appendix A, figure 2 and figure 3).

A Google Form-based online survey was created and distributed through the teachers' Telegram group in order to gather data. The questionnaire was first designed in English and considering the fact that most teachers do not understand English, the questionnaire was translated into Russian (see Appendix B). There were 13 questions in the survey. Nine were multiple-choice questions, two Likert scale questions, and the remaining two were open-ended. Teachers were asked about their demographics, the



subject they teach, the type of school they work at, how they feel about creativity and technology, and whether they think that technology may have an impact on creativity.

The participants were informed that this questionnaire is anonymous and that all answers will only be utilized for academic purposes.

Results

The results of the study are discussed in this section. In specifically, teachers' attitudes on employing technology in the classroom, how they define creativity, their views on how technology may foster creativity, and their perspectives on virtual reality.

Teachers' attitudes on technology

5. Достаточно ли в вашей школе цифровых технологий (ноутбуков, компьютеров, проекторов) для проведения уроков? 35 ответов



Figure 1- Availability of digital technology

6. Если да, то какой из них вы предпочитаете использовать во время занятий? 35 ответов









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7. Разрешаете ли вы студентам использовать технологии (ноутбуки, мобильные телефоны) во время занятий? 35 ответов



Figure 3- Teachers' attitude on using technology

The results of Figure 1 show that only 40% of teachers in the respondents' sample felt that their school had enough digital technology, while 60% felt that there wasn't enough of it.

At the same time, Figure 2 indicates that just 11.4% of teachers preferred textbooks, while 45.7% selected a projector with slides, 22.9% chose a PC or laptop, and 20% favored a combination of technologies with textbooks.

Lastly, Figure 3 demonstrates that the majority of professors permit students to use digital tools during classes, with 57.1% of them allowing it solely for accomplishing tasks and 31.4% of them permitting it in all circumstances. Only 11.4% of respondents forbade it completely.

How teachers define creativity

			Originality	16		Table 1-
definition	of		Uncertain answers	13		creativity
			Freedom and	6		
		dive	ersity			

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 В какой степени вы согласны или не согласны со следующим утверждением? Креативный подход должен быть применен ко всем областям знаний.
^{35 ответов}



10. Уровень креативности учеников зависит от... 35 ответов



Figure 5- Factors of creativity

Table 1 shows that 16 educators characterized creativity as something unique and extraordinary. For them, creativity is stepping away from conventional knowledge and guidelines and considering a problem from a different perspective. Furthermore, it represented independence and diversity for 6 teachers. However, 13 teachers responded unclearly to this question.

Figure 4 illustrates that, of the instructors surveyed, 34.3% completely agreed and 48.6% somewhat agreed that creativity should be incorporated into all areas of knowledge. Only 8.6% of the professors were neutral and in disagreement.





According to Figure 5, 54.3% of respondents believed that level of creativity is determined based on the combination of both genes and environment. At the same time, 31.4% of respondents believed in the influence of the environment and 14.3% claimed it depended on genes.

Teachers views on how technology may foster creativity

11. Влияет ли использование цифровых технологий на креативность уроков? ^{35 ответов}



Figure 6- Technology effect on creativity

▶ Да ▶ Нет

More	opportunities	and	15	
efficiency				
No effe	ct		12	
Uncerta	in answers		8	

Table 2- How can technology enhance creativity

The findings of the current study, which are depicted in Figure 6, indicate that a vast majority of teachers, 65.7%, agreed that the usage of digital technologies influences the creativity of lessons. Only 34.3% of educators questioned this viewpoint.

According to Table 2, 15 teachers reported the fact that technology provides students with more opportunities during classes and is quick and efficient as the two primary reasons why they could inspire creativity in students. Furthermore, 8 teachers



either gave an uncertain response or skipped this question. The remaining 12 teachers held the opinion that the use of digital technology does not affect the creativity of lessons and that teachers may still foster students' creativity even in the absence of technology by delivering lessons with enthusiasm.

Teachers' perspectives on virtual reality

13. В какой степени вы согласны или не согласны со следующим утверждением? Игры VR (виртуальная реальность) могли бы развивать к...тивность студентов в академических целях. 35 ответов



Figure 7- Teachers' attitude towards VR

The most controversial findings came from the inquiry into the potential contribution of VR to the development of creativity for academic purposes. There was a wide spectrum of opinions expressed: 20% fully agreed, 2.9% totally disagreed, 20% disagreed, 22.9% agreed, and the remaining 34.3% were neutral (Figure 7).

Overall, the findings indicated that teachers generally have a good attitude toward digital technology and creativity and believe that technology might stimulate creativity.

Discussion

This section discusses the important findings and compares them with that in the Literature review.

This research investigated high school teachers' perspectives on how using technology in the classroom could encourage creativity. Previous studies have demonstrated that some teachers believed that technology boosted students' engagement and curiosity, two qualities necessary for classroom creativity (Alsahou,

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2015). Yet, there were some unfavorable outcomes as well, such as distraction and access to ready-made answers, because of the digital technology (Scott, 2015). According to the current study's findings, most high school teachers in Uzbekistan feel that technology can improve creativity, but only two-thirds of them could clearly explain how. It could be because teachers in our region may not have enough experience using digital technology as a result, as indicated by their reports that the majority of them lacked sufficient digital technology. The findings also revealed that due to its lack in the classroom, most of the teachers allow their students to use their own digital technology during classes such as laptops.

Another unexpected outcome was that some of the teachers were able to describe how using technology in the classroom might boost creativity despite having limited access to it. More potential provided by digital technology, its capacity to improve analytical skills, and its effectiveness have generally been acknowledged. Teachers are most likely aware of the advantages of digital technology because they use it at home or have read about it on the internet. Nonetheless, most of the responses were similar, and some of them were even uncertain. At the same time, earlier studies discovered that educators may hold a wide range of views about the value of technology in developing creativity (Adams, 2013). In opposition to the current study, which questioned regular high school teachers, earlier research was focused on the expert teachers, hence the answers are different.

Additionally, in order to comprehend teachers' attitudes toward creativity, it was necessary to determine how well teachers understood creativity and how they defined it. The findings demonstrated that Uzbek high school teachers viewed creativity as something unique and believed that it meant thinking out of the box. Furthermore, the vast majority of educators thought it should be used in all areas of study. This leads to the conclusion that Uzbek high school teachers value and understand creativity as a significant component of modern education.

Even though earlier studies had demonstrated the benefits of using VR in teaching, some teachers had concerns about it. The majority of the teachers favored

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this approach, while one-third of them remained neutral. It can be due to the fact that VR is underutilized in our area and some teachers are unaware of its advantages. In other parts of the world, great work has gone into establishing strategies for integrating VR into the classroom in order to promote professional development and creativity (Lu et al., 2014). Due to this, Uzbek teachers will adopt a more confident attitude if they gain greater knowledge of virtual reality.

This survey has revealed that, despite its deficiency, most teachers have a positive opinion about digital technology and are prepared to integrate it into the classroom to stimulate students' creativity.

The study has certain limitations. Since the survey contained questions that required self-reporting some responses were not accurate and certain respondents did not take answering the questions in the survey seriously.

Conclusion

The purpose of this research was to examine the views of Uzbek high school teachers on how technology might encourage creativity in the classroom. The findings demonstrated that Uzbek educators are ready to implement this technique into their lessons and believe that technology may improve creativity. Despite the lack of digital technology in schools, teachers showed a very positive attitude about using it in the classroom. Moreover, educators had a strong grasp of the definition of creativity as well as an awareness of the fundamental advantages of technology. Finally, the inquiry of teachers' perceptions of virtual reality in the classroom led to the conclusion that high school teachers in the region require assistance in comprehending virtual reality and its advantages.

Recommendations

Based on the findings the following course of action is suggested:

•The Ministry of Higher Education of Uzbekistan should supply adequate amount of modern equipment to local schools.

•Integrate digital technology into the lessons because the majority of teachers believe that doing so may encourage creativity.





• To improve the skills of local teachers, experienced teachers who have already incorporated technology to foster creativity should be approached for conducting trainings.

•It is essential to develop special courses and instruct teachers on the usage of VR, because some teachers are still unaware of its advantages.

•Based on the limitations suggested in Discussion section; future research should be conducted, using different methods of data collection such as observation. Specifically, teachers' classes could be observed to identify how well they can use digital technology in enhancing creativity of students during lessons.

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