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INTEGRATING MIXED (AR & VR) REALITY INTO EFL TEACHING IN KAZAKHSTANI SECONDARY SCHOOL

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Abstract. This article explores the use of Mixed Reality, combining Augmented Reality and Virtual Reality, for teaching English as a Foreign Language in secondary schools in Kazakhstan. The shift towards technology-based education is crucial for preparing students in the globalized world. The study examines the advantages of mixed reality, emphasizing its ability to create an immersive and dynamic educational environment for seventh-grade students. The integration of mixed reality into language education occurs gradually, investigating its potential and highlighting benefits such as increased student engagement, real-world context for language preparation, and enhanced retention of vocabulary. Practical examples of using platforms like 360Cities, P360, and CoSpaces.edu in foreign language classes are provided to improve communication skills. The research among teachers reveals a moderate use of augmented and virtual reality technologies in the classroom, impacting learning outcomes. The study includes an experimental group exposed to augmented and virtual reality technologies, demonstrating higher proficiency in language acquisition compared to the control group, which followed traditional language teaching methods without the use of innovative technologies. The article presents examples of how immersive atmospheres on the P360 platform can be utilized in lessons to enhance reading, speaking, and writing skills. However, further research on the application of augmented, virtual, and mixed reality in language education, as well as teacher training for maximizing the benefits of these technologies, is needed. Overall, the incorporation of mixed reality into the educational process shows potential for creating a dynamic and successful foreign language learning experience in Kazakhstan's secondary schools.

Key words: Technology innovations, Mixed Reality, Augmented Reality, Virtual Reality, Educational environment in Kazakhstan, Language acquisition, Immersive educational experience, Teacher training

Basic provisions

The article provides a literature analysis on the ideas of Augmented, Virtual, and Mixed Reality, focusing on their educational value. It addresses these technologies' possible use in language teaching and teacher training. The study includes actual examples of how AR, VR, and MR platforms can improve language acquisition and communication abilities in seventh-grade pupils.

The materials and techniques section discusses how educational platforms like 360Cities, P360, and CoSpaces.edu can help improve the EFL classroom experience.

The experimental group, which was exposed to AR and VR features, outperformed the control group in terms of language acquisition and retention.

The study finishes by emphasising the possibilities for incorporating Mixed Reality into EFL learning, bridging the gap between traditional teaching methods and cutting-edge technology. Challenges, successful implementation tactics, and the value of teacher training are all underlined. The findings indicate that MR can greatly improve language acquisition, engagement, and retention for EFL students in Kazakhstan, resulting in a dynamic and successful learning experience.

Introduction

Technology innovation has ushered in a new era of educational opportunities, changing how students study and interact with the curriculum. The use of modern educational technologies is vital in Kazakhstan's secondary schools, where English as a Foreign Language (EFL) instruction is essential for preparing students for an increasingly globalised world.

The purpose of this study is to look into the use of Mixed Reality (MR), which mixes Augmented Reality (AR) and Virtual Reality (VR), in traditional language schools. By immersing students in a dynamic and interactive digital environment, MR technology provides a promising chance to improve EFL training. By combining the actual and virtual worlds, MR provides an immersive learning experience that can be extremely beneficial to language learners.

The educational landscape in Kazakhstan is changing, with a greater emphasis on modernising teaching methods to better prepare students for the challenges and opportunities of the twenty-first century. Language acquisition is a crucial part of this preparation, and MR technology has the potential to change the way English is taught in Kazakhstan's secondary schools.

We will examine the advantages of MR in language learning, its applicability in EFL classrooms, and how educators in Kazakhstan might employ MR to create engaging and immersive English language courses for 7th-grade students. The goal of this research is to bridge the gap between traditional teaching methods and cutting-edge technology, paving the way for a more engaging, dynamic, and successful EFL learning experience in Kazakhstan.

The concept of Augmented, Virtual and Mixed Reality

Immersive technologies, such as virtual reality (VR), augmented reality (AR), and mixed reality, allow for the construction of natural and intuitive digital environments. Virtual reality (VR) immerses users in simulated worlds, augmented reality (AR) superimposes digital information over the real world, and mixed reality mixes virtual and physical domains. These technologies have a number of educational benefits, including engaging students in active learning, providing genuine and concrete topic experiences, increasing cooperation, promoting engagement, and catering to a variety of learning styles. Using VR and AR, educators may create more engaging, immersive, and collaborative learning experiences for students in a digitally transformed reality (Vivian 2023). AR, VR, and mixed reality are wide terms that refer to a variety of technologies that enable the incorporation of digital elements into the

real world or the creation of entirely digital environments, allowing users to interact with information and other users (Bonner, Reinders (2018). Patel et al. (2020) discuss the applications of virtual reality (VR), augmented reality (AR), and mixed reality (MR) in education. They emphasise how VR is an excellent tool for facilitating learning and teaching processes, since learners recall content experienced in VR more successfully. Furthermore, augmented reality (AR) is frequently used in preschool, secondary, and higher education to create engaging and unique learning experiences such as interactive books and instructional games. Finally, Mixed Reality (MR) is gaining traction in education, allowing students to actively affect their learning processes while also giving applications for education and manufacturing training. AR and VR technologies are gaining acceptance in K-12 education, enhancing classroom experiences and enabling blended and distant learning. These immersive tools engage students both in-person and remotely, offering inclusive solutions for those with autism, ADHD, dyslexia, or other cognitive and learning issues (Dick, 2021). Rudnik (2023) emphasises the growing need of implementing Augmented Reality (AR) and Virtual Reality (VR) technology into education, particularly language teaching and teacher training. The study's purpose is to investigate the educational potential of AR and VR technologies in these contexts, concentrating on their ability to engage and immerse learners while also offering an overview of available applications for teaching and professional development. Fu (2021) provides an overview of the history and development of Virtual Reality (VR) and Augmented Reality (AR) technologies, with a focus on their recent commercialization and widespread adoption in fields such as education. The adoption of 5G technology is seen as a catalyst for developing intelligent learning systems, enabling all-time, all-space, and all-audience access to education, and revolutionising classroom instruction. Fu also investigates the potential of VR/AR technology to revolutionise traditional education and teaching techniques, particularly in the context of animation professional programmes, emphasising the importance of integrating content with these technologies in order to effectively address the audience. Avila-Garzon (2021) investigates the growing interest in augmented reality (AR) technology in educational settings. AR technology enables users to superimpose digital information on the real world, resulting in innovative learning experiences while reducing cognitive stress. AR has been shown in study to improve students' learning outcomes and motivation, with meta-analyses indicating a medium effect size for AR on education. This technology is being studied in a range of educational sectors, including science, engineering, and social sciences, as an effective method of supplementing traditional pedagogy.

The Potential of Mixed Reality and its implication in EFL Education

There are several advantages of adding Mixed Reality (MR) into secondary language training. Immersive experiences increase engagement, provide real-world context for language learning, and stimulate multiple senses to promote vocabulary memory. It allows for personalised training, cultural immersion, and rapid feedback on language skills while encouraging student interaction. MR also helps to remove language barriers, boosts motivation and confidence, and promotes long-term retention of language skills, making it a valuable tool for improving language training.

According to Patel et al. (2020), people can immerse themselves in computer-generated worlds by using either PC-connected headsets for high-definition experiences or more affordable standalone headsets, which typically use cell phones. Augmented Reality (AR) experiences can be created with smart glasses and AR headsets that overlay digital objects on the real world, or with portable devices like smartphones and tablets that run AR apps. Finally, Patel et al. (2020) identify holographic technology such as Microsoft's HoloLens as well as immersive devices that completely block out the real world as providing distinct Mixed Reality (MR) experiences. When mixed reality (MR) is used in language instruction at school, it improves the overall educational experience for students. According to Bonner and Reinders (2018), virtual reality (VR) can reduce distractions in the classroom by immersing students in the subject matter, facilitating real-world connections, and aiding comprehension. The authors say that AR and VR provide "embodied" and "extended" cognition, which involves bodily interaction with the virtual environment, and they encourage language teachers to explore with these technologies in the classroom through practical exercises that do not require technical understanding. According to Songsiengchai (2023), using Augmented Reality (AR) technology in the classroom increases listening skills by presenting captivating and dynamic real-life scenarios, allowing students to practise their listening and speaking skills more successfully. Boyles (2017) explores the growth of low-cost virtual reality (VR) technologies, such as Google Cardboard, and how it can benefit education. Foreign language VR Instruction emphasizes on engagement with native speakers through the use of 3D virtual settings, which bridges the distance gap and allows students to chat with native speakers all over the world. "The Promise of Immersive Learning" (2021) looks at augmented and virtual reality applications in K-12 education. It highlights integration opportunities such as Smithsonian and NASA 3D models, content collections from platforms such as The New York Times, Edtech services such as ClassVR and Kai XR, specialized programmes for special education such as Project VOISS and Floreo, and the potential for diverse learning experiences provided by AR and VR technologies, ranging from history and science to social skill development. Rudnik (2023) suggests employing image-based AR for spelling games, Metaverse AR for personalised language experiences, VR language learning games with speech recognition, and Discovery VR for historical exploration while teaching foreign languages. Bonner & Reinders (2018) offer several programmes and technologies for teaching foreign languages using AR, VR, and Mixed Reality, including Vuforia Chalk, Ikea Place, Google Cardboard, Oculus Go, and Microsoft Hololens.

Figure 1 summarizes the technologies that can be utilized to teach 7th-grade students in secondary school, as well as their potential for developing communication skills (reading, writing, listening, and speaking).

Technology	Application in Education	Potential for Developing Skills
Virtual Reality (VR)	Interaction with native speakers through 3D virtual worlds, bridging geographical gaps.	**Listening:** Immersive language experiences improve listening comprehension. **Speaking:** Engaging with native speakers enhances speaking skills. **Reading:** Reading comprehension can be enhanced through VR storytelling. **Writing:** Creative writing exercises can be stimulated by inspiring VR environments.
Augmented Reality (AR)	Integration of 3D models, 360° videos, and interactive content into lessons.	**Listening:** Interactive AR content can improve listening skills. **Speaking:** Speaking activities can be enhanced with AR simulations. **Reading:** Augmented reality can make reading materials more interactive.**Writing:** Writing assignments can be related to AR experiences.
Mixed Reality (MR)	Combines elements of the real world and digital content, creating immersive experiences.	**Listening:** MR can provide realistic soundscapes for listening practice. **Speaking:** Students can engage in conversations with virtual characters in MR. **Reading:** Reading tasks can incorporate MR elements to enhance engagement. **Writing:** Writing can be inspired by MR scenarios and settings.
AR Language Learning Apps	Utilizing AR applications specifically designed for language learning.	**Listening:** Interactive AR language apps often include listening exercises. **Speaking:** AR apps may incorporate speaking practice through pronunciation feedback. **Reading:** Reading comprehension can be improved with AR language exercises. **Writing:** Some AR apps may include writing exercises.
VR Language Learning Games	Immersive language games and simulations in virtual reality environments.	**Listening:** VR games can include speech recognition for improved listening. **Speaking:** Speaking and conversation practice with virtual characters. **Reading:** Reading tasks and narratives within VR games. **Writing:** Creative writing based on VR experiences.
Discovery VR Experiences	Exploring historical events, scientific concepts, and celestial bodies in VR.	**Listening:** Descriptive narration in VR experiences enhances listening. **Speaking:** Discussing findings and discoveries in VR promotes speaking. **Reading:** Reading about topics explored in VR content. **Writing:** Writing reports or summaries based on VR explorations.

Figure 1 - AR, VR, MR for educational purposes

These technologies provide engaging and immersive experiences for 7th-grade students on their language learning journey, offering a variety of opportunities to improve language skills.

Materials and Methods

In our study, we used educational platforms such as 360Cities, P360 (mobile version), and CoSpaces.edu to improve the English as a Foreign Language (EFL) classroom experience, focusing on topics such as communication and technology, holidays and travel, environmental issues, natural disasters, and healthy habits.

Here is a figure (See Figure 2) that describes the capabilities of the platforms 360Cities, P360 (mobile version), and CoSpaces.edu for 7th-grade students, as well as how they can be integrated into discussions on various themes while developing communication skills and achieving specific learning outcomes:

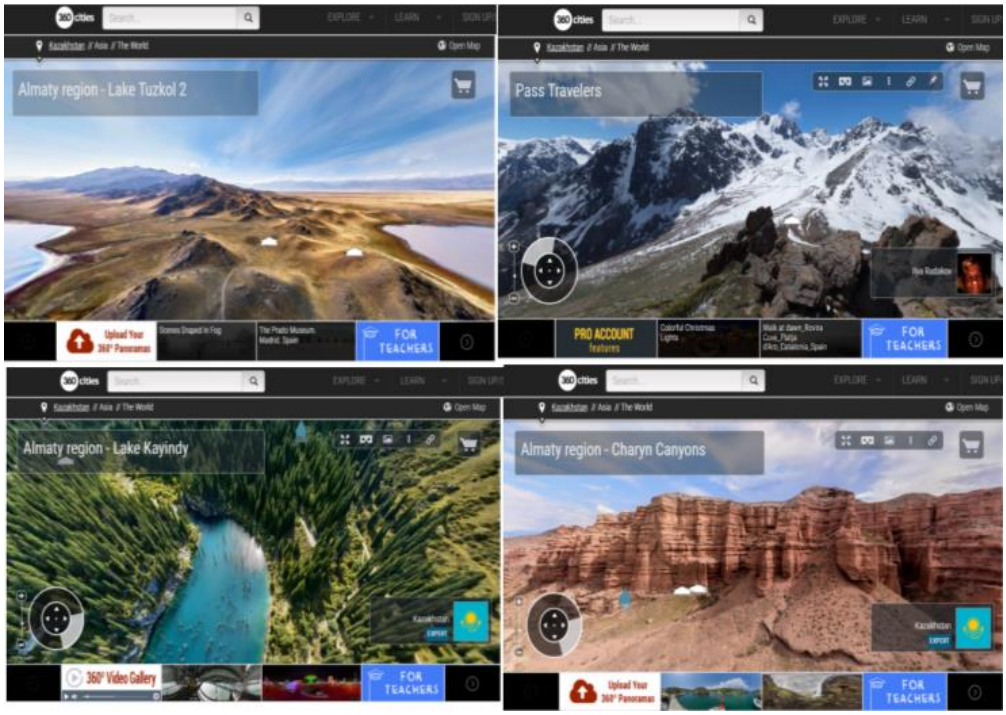
Platform	Potential for 7th-grade Pupils	Incorporation in Topics	Developed Communication Skills	Learning Outcomes
360Cities	Explore real-world locations	Holidays and Travel: Virtual tours of holiday destinations, Environmental Problems: Visualizing polluted areas	Listening, Speaking, Reading	Enhanced geographical knowledge, improved listening and speaking skills
P360 (Mobile Version)	Immersive 360° experiences	Natural Disasters: Virtual simulations of disasters, Healthy Habits: Interactive health scenarios	Listening, Speaking, Reading	Increased knowledge retention, improved critical thinking, and empathy towards health issues
CoSpaces.edu	Create interactive VR content	Communication and Technologies: Design tech-based projects, Environmental Problems: Develop virtual solutions	Speaking, Writing, Creativity	Enhanced creativity, problem-solving skills, and technology literacy

Figure 2 - The potential of the platforms, gained skills and outcomes

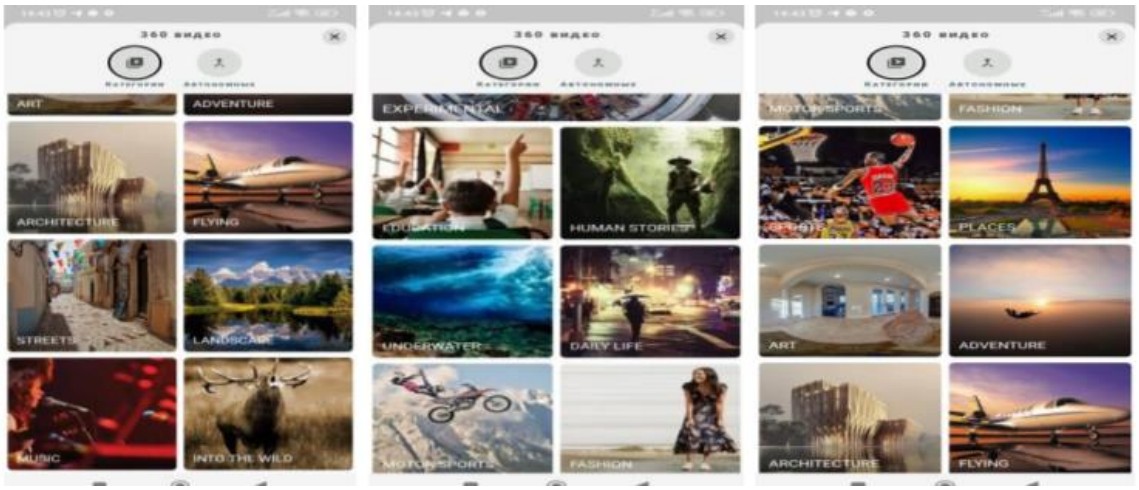
These platforms provide a variety of options for 7th-grade pupils to engage with information while also learning important communication skills.

360Cities is a virtual tour website that focuses on panoramic and 360-degree images. It allows photographers and users to post and share panoramic images, as well as create immersive and interactive experiences. Users can explore several sites across the world, including Kazakhstan, using fully immersive panoramas on the site. It is widely utilized in 360-degree format to show off stunning landscapes, cityscapes, landmarks, and other distinctive destinations. Users can navigate through the photos, zoom in and out, and add comments or explanations to specific locations within the panoramas.

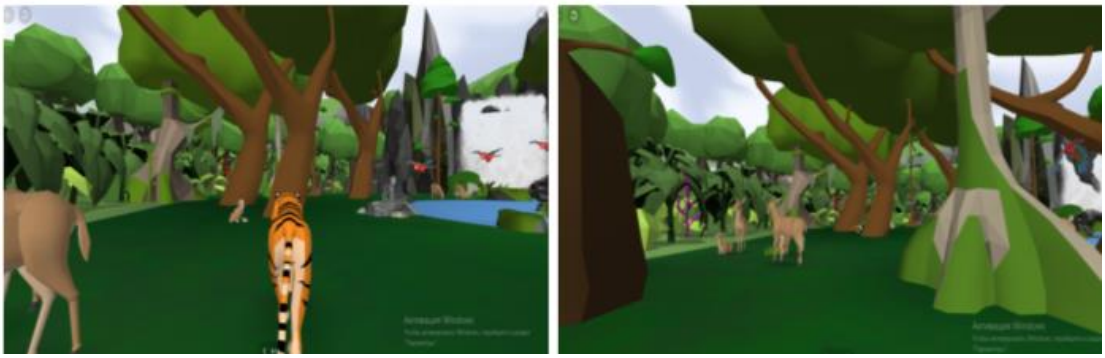
This platform enables the combination of Augmented and Virtual reality, resulting in Mixed reality, by allowing users to immerse themselves in the virtual environment and move the items to obtain meaningful information about the concepts presented.



P360 is a mobile app or platform that enables immersive experiences. It is most likely designed to provide users with immersive content, such as 360-degree photos or videos, virtual reality (VR) experiences, or augmented reality (AR). Teachers and students can simply build their own masterpieces, such as panoramas and virtual films, and adapt them to the local context.



CoSpaces.edu enables users to design their own augmented reality items. This revolutionary feature enables users to create and integrate virtual items into the actual world, improving interactive and immersive learning experiences.



Overall, these platforms provide students with an interactive and engaging way to learn about a range of topics, while also improving their language skills and cognitive development.

Results

Our research involved two groups: an experimental group of 20 teachers and 22 seventh-grade students, and a control group of 20 students.

We conducted an online survey (Figure 3) for the experimental group of teachers to learn more about the integration of immersive technologies like Augmented Reality (AR) and Virtual Reality (VR) in the EFL classroom. The purpose was to evaluate instructors' viewpoints and experiences with these technologies in educational environments.

Online Survey: Experience with Immersive Technologies

1. Have you ever used Augmented Reality (AR) or Virtual Reality (VR) technologies in your EFL classroom?
   - ☐ Yes
   - ☐ No
2. How do you perceive the impact of AR and VR technologies on EFL learning outcomes?
   - ☐ Very Positive
   - ☐ Positive
   - ☐ Neutral
   - ☐ Negative
   - ☐ Very Negative
3. What challenges or obstacles have you encountered when integrating AR or VR into your EFL classroom, if any?
   _____
4. How do you typically incorporate AR or VR technologies into your EFL lessons? (e.g., for vocabulary, cultural immersion, listening practice, etc.)
   _____
5. Do you believe that AR and VR technologies align with your teaching objectives in the EFL classroom? Please explain.
   _____
6. Have you received any formal training or professional development related to using AR or VR in education?
   - ☐ Yes
   - ☐ No

   If yes, please describe the type of training you have received and how it has influenced your use of these technologies in the classroom.

Figure 3 - Quantitative research survey for measuring the perspectives and experiences of teachers regarding the integration of immersive technologies

The following findings were derived from survey responses from secondary education instructors who discussed their experiences with immersive technologies in the EFL classroom. More than half of the secondary school teachers polled (approximately 55%) have integrated VR applications (Kahoot, Spinner, and so on) into their EFL lessons, indicating a moderate level of adoption, whereas AR and VR have fully immersive platforms that allow students to go on virtual field trips.

Perceptions of the impact of AR and VR on EFL learning outcomes ranged from "Very Positive" to "Very Negative," with roughly 40% expressing a positive viewpoint and 25% expressing a negative outlook, indicating a split on the effectiveness of these technologies. The poll did not address the intricacies of how teachers typically incorporate AR or VR technologies into their EFL lessons, demanding further inquiry into this topic.

To conduct this study, the control group of students were assigned standard curriculum-based topics, while the experimental group was given assignments that included AR, VR, and Mixed Reality components. Students had fascinating and immersive learning experiences thanks to the use of these tools. To analyse the efficacy of various tactics, both groups were given pre- and post-tests to measure their language competency progress. Furthermore, we monitored students in the experimental group on a regular basis to measure their level of engagement and participation.

The study's findings revealed that the experimental group did better than the control group in terms of language learning and retention after being exposed to AR and VR aspects in their courses. They displayed increased participation, vocabulary retention, and grammar proficiency. These findings highlight the potential for immersive technologies such as augmented reality (AR) and virtual reality (VR) to improve EFL learning outcomes.

Practical Examples for the Language Classroom

Healthy Lifestyle: Travel to Almaty Region - Chundzha Health Resort

Objectives: This assignment aims to develop reading, speaking, and writing skills while exploring Chundzha Health Resort in Kazakhstan using P360 panoramas and videos.

Required time: 45 min

Productive language skills

Task 1: Read the article 'Chundzha Health Resort: A Natural Oasis in Kazakhstan'.

Task 2: Decide if the following statements are true or false.

Task 3: Answer the following questions related to the article.

Task 4. Watch the P360 panorama of Chundzha Health Resort using the link https://teliportme.com/view/2136489

Task 5. Imagine you are going to visit Chundzha, and you want to tell your friends or classmates about this specific feature. Use the useful phrases provided to structure your speech.

Discussion

Integrating Mixed Reality (MR), which includes Augmented Reality (AR) and Virtual Reality (VR), into EFL instruction in Kazakhstani secondary schools presents a significant opportunity for educational improvement. This study's findings and consequences spark important discussions about a number of vital issues.

According to the poll, approximately 55% of teachers have used AR or VR technologies in their EFL sessions. However, assessments of the influence of these technologies differ, with both good and negative outlooks. Further research is needed to integrate fully immersive technologies into EFL courses and better understand the aspects that influence teachers' perceptions and experiences.

Further research into how these technologies integrate into the curriculum and improve learning outcomes is required. This could help to set criteria for effective integration.

The study's findings show that the experimental group, which was exposed to AR and VR features, outperformed the control group in terms of language acquisition and retention. This research highlights the potential of immersive technologies for boosting language learning. However, more research is required to investigate the long-term consequences and viability of these increases.

The study emphasizes the necessity of teacher training and assistance in achieving successful technology integration. It is critical to establish comprehensive training programmes that equip educators with the skills they need to fully utilise AR and VR technology.

The literature study focuses on the many applications of AR, VR, and MR in language instruction. These technologies, which vary from interactive language apps to virtual simulations of real-world settings, provide a diverse spectrum of options. Future study should look into novel approaches to use AR, VR, and MR for EFL training.

Conclusion

Finally, the incorporation of Mixed Reality (MR), which includes Augmented Reality (AR) and Virtual Reality (VR), into EFL instruction in Kazakhstani secondary schools presents significant potential. Challenges and effective implementation strategies require further investigation. Our findings imply that MR improves language acquisition, engages students, and increases retention. It emphasises the value of teacher training and support. Overall, MR can bridge the gap between traditional teaching methods and cutting-edge technology, resulting in a more dynamic and successful EFL learning experience in Kazakhstan.

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ҚАЗАҚСТАН ОРТА МЕКТЕБІНДЕ ШЕТЕЛ ТІЛДЕРІН ОҚЫТУДА АРАЛАС (ТОЛЫҚТЫРЫЛҒАН ЖӘНЕ ВИРТУАЛДЫ) НАҚТЫЛЫҚТЫ ИНТЕГРАЦИЯЛАУ

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Аңдатпа. Бұл мақалада Қазақстанның орта мектептерінде ағылшын тілін шет тілі ретінде оқыту үшін толықтырылған шындық пен виртуалды шындықты біріктіретін Аралас шындықты пайдалану талқыланады. Жаһандану әлемінде оқушыларды дайындау үшін инновациялық технологияларға негізделген білім беруге көшу маңызды. Зерттеу аралас шындықтың артықшылықтарын зерттеп, оның жетінші сынып оқушылары үшін иммерсивті және динамикалық оқу ортасын құру қабілетіне назар аударады. Аралас шындықты шет тілін оқытуға біріктіру оның әлеуетін зерттей отырып, студенттердің белсенділігін арттыру, шет тілін оқыту үшін нақты әлемдегі контекст және сөздік тезаурустарды жақсы сақтау сияқты

артықшылықтарды анықтау арқылы кезең-кезеңімен жүзеге асырылады. Мақалада 360Cities, P360 және CoSpaces.edu сияқты платформаларды қарым-қатынас дағдыларын жақсарту үшін орта мектептің шет тілі кабинеттерінде пайдаланудың практикалық мысалдары келтірілген. Мұғалімдер арасында жүргізілген зерттеу олардың оқу нәтижелеріне әсер ететін қосымша және виртуалды шындық технологияларын сабақта қалыпты қолдануын көрсетеді. Зерттеуге кеңейтілген және виртуалды шындық технологиялары қолданылған, кейіннен инновациялық технологияларды қолданбай стандартты дәстүрлі шет тілін оқытуды ұстанған бақылау тобымен салыстырғанда шет тілін меңгеруде жақсы нәтиже көрсеткен эксперименттік топ кіреді. Мақалада оқу, сөйлеу және жазу дағдыларын жақсарту үшін P360 платформасындағы берілген тақырыптағы иммерсивті атмосфераны сыныпта қалай пайдалануға болатыны туралы мысалдар келтірілген. Дегенмен, осы технологиялардың артықшылықтарын барынша арттыру үшін шет тілін оқытуда және мұғалімдерді оқытуда кеңейтілген, виртуалды және аралас шындықты пайдалану бойынша көбірек зерттеулер қажет. Жалпы алғанда, білім беру үдерісіне аралас шындықты енгізу Қазақстанның жалпы білім беретін мектептерінде шет тілін қарқынды және табысты оқыту тәжірибесін құрудың әлеуетін көрсетеді.

Тірек сөздер: Технологиядағы инновация, аралас шындық, толықтырылған шындық, виртуалды шындық, Қазақстандағы білім беру ортасы, тілді меңгеру, иммерсивті білім беру тәжірибесі, мұғалімдерді оқыту

ИНТЕГРАЦИЯ СМЕШАННОЙ (ДОПОЛНЕННОЙ И ВИРТУАЛЬНОЙ) РЕАЛЬНОСТИ В ПРЕПОДАВАНИИ ИНОСТРАННЫХ ЯЗЫКОВ В СРЕДНЕЙ ШКОЛЕ КАЗАХСТАНА

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Аннотация. В данной статье рассматривается использование Смешанной Реальности, объединяющей Дополненную Реальность и Виртуальную Реальность, для обучения английскому как иностранному языку в средних школах Казахстана. Переход к образованию, основанный на инновационных технологиях, критичен для подготовки обучающихся в мире глобализации. Исследование рассматривает преимущества смешанной реальности, акцентируя внимание на его способность создавать погружающую и динамичную образовательную среду для обучающихся седьмого класса. Интеграция смешанной реальности в иноязычное образование происходит поэтапно, исследуя его потенциал, выявляя преимущества, такие как повышенное вовлечение обучающихся, реальный контекст для иноязычной подготовки и лучшее запоминание словарного тезауруса. В статье предоставлены практические примеры использования платформ, таких как 360Cities, P360 и CoSpaces.edu в иноязычных классах средних школ для улучшения навыков коммуникации. Исследование, проведенное среди учителей, показывает умеренное использование ими технологий дополненной и виртуальной реальности в классе, что влияет на результаты обучения. Исследование включает экспериментальную группу, к которой применялись технологии дополненной и виртуальной реальности, которая в дальнейшем показала более высокие результаты при освоении иноязычного материала по сравнению с контрольной группой, которая следовала стандартному традиционному обучению иностранного языка без использования инновационных технологий. В статье приводятся примеры, как погружающаяся атмосфера по заданной теме на платформе P360 могут быть использованы на

уроках для улучшения навыков чтения, разговорной речи и письма. Тем не менее, требуются дополнительные исследования применения дополненной, виртуальной и смешанной реальности в иноязычном обучении и подготовка учителей для максимизации преимуществ этих технологий. В целом внедрение смешанной реальности в учебный процесс демонстрирует потенциал для создания динамичного и успешного опыта обучения иностранному языку в средних школах Казахстана.

Ключевые слова: Инновации в технологиях, смешанная реальность, дополненная реальность, виртуальная реальность, образовательная среда в Казахстане, освоение языка, погружающий образовательный опыт, подготовка учителей

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