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Transforming English Language Teaching: Integrating AI and Immersive Technologies for Enhanced Learning Experiences

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Abstract: The study aims to analyze the relationship between English language teaching and integrating artificial intelligence and immersive technologies to improve learning efficiency. The methods of analysis, synthesis, and scientific abstraction were used. Immersive technologies and artificial intelligence have long been used in teaching various sciences in schools and universities to make the subjects more straightforward to understand. Understanding the basics of English language teaching and methods and ways to integrate artificial intelligence and immersive technologies will speed up and simplify the teaching process, directly affecting learning effectiveness.

Keywords: teaching technologies, language learning, pedagogical innovations, visualization, virtual reality, augmented reality.

Introduction

The impact of artificial intelligence and immersive technologies on the transformation of English language teaching is a topic of global significance. English, as one of the most widely spoken languages, is a key player in the processes of globalization, constantly evolving with the introduction of new words and expressions and finding extensive use in science-intensive fields. This global relevance has led to changes in Ukrainian legislation, with English now officially recognized as one of Ukraine's international communication languages (Supreme Council of Ukraine, 2023).

While legislation can establish the status of English, it is the qualitative changes in the teaching process that truly transform its use in education. Pedagogical innovations, including artificial intelligence and immersive technologies, are driving these changes. The use of these tools in English language study redefines the role of the teacher, emphasizing the design of a multimodal virtual environment and the creation of immersion scenarios for material visualization. The growing recognition of 'immersiveness' as a powerful and effective tool for learning enhancement (Hamilton et al., 2020) instills hope and optimism for the future of English language teaching.

Research results

The pedagogical community's interest in immersive technologies and their further use in education is due to the digitalization of the educational space and the formation of a wide range of concepts and phenomena related to virtual or augmented reality technologies in many spheres of human activity, including education (Leshchenko et al., 2023).

Immersive technologies are a general term for several technologies that blur the boundaries between the physical and digital worlds. They refer to technologies that allow user interaction and create a sense of immersion. Immersive technologies consist of augmented (AR), virtual (VR), and mixed reality (MR) (Efimov, 2021).

Scientific research has different definitions of the term "virtual reality" (VR). VR is "a collection of hardware and software systems that seek to enhance the immersive sensory illusion of being in another environment" (Biocca & Delaney, 1995). Furthermore, VR is “a system that aims to simulate real life by providing topography, movement, and physics that create the illusion of being there” (Lin & Lan, 2015).

Virtual environments (VR) are extremely promising for language learning because they can create an immersive and authentic environment for social interaction with native speakers and provide learners with a particular channel of interpersonal communication.

Using virtual technologies with a high level of immersion helps students achieve a strong sense of presence, enhancing positive feelings during the assigned study task.

The positive effects of immersive technologies on students' English language learning include increasing the effectiveness of their language skills in professional activities, increasing motivation, and engaging students in cooperation with each other and with native speakers of the foreign language they are learning (Lan, 2020).

The main directions of immersion (immersion) can be defined as:

1. Tactile Immersion: Experienced during tactile operations that require skill. In the role of players, students feel "in the zone, " perfecting the actions that lead to success.

2. Strategic immersion: is more intellectual and involves a mental challenge. Students experience strategic immersion as they choose the correct solution from various options.

3. Narrative Immersion: Students immerse themselves in the story, like reading a book or watching a movie.

Immersive media is a term applied to a group of concepts also used in education. It includes the following immersion technologies (Table 1).

Table 1

The connection between the immersive technologies selected for review and their essence

№	The name of the technology	The essence of technology
1	Virtual Reality (VR)	The technology aims to fully immerse the user in a computer-generated world, giving the impression that he is inside an artificial world. This is achieved by using head-mounted display (HMD) technologies or multiple projections. The HMD allows you to project VR in front of users' eyes and focus on it without distraction.
2	Augmented Reality (AR)	Interactive technology that combines the natural world and computer-generated content. Content can span multiple sensory modalities, including visual, auditory, tactile, somatosensory, and olfactory. AR can be defined as a system that includes three main functions: combining the real and virtual worlds, real-time interaction, and accurate 3D registration of virtual and natural objects.
3	Mixed Reality (MR)	The technology of fusion of the natural environment and the one created by the computer. Physical and virtual objects can coexist in mixed-reality environments and interact in real time. Many potential use cases exist for

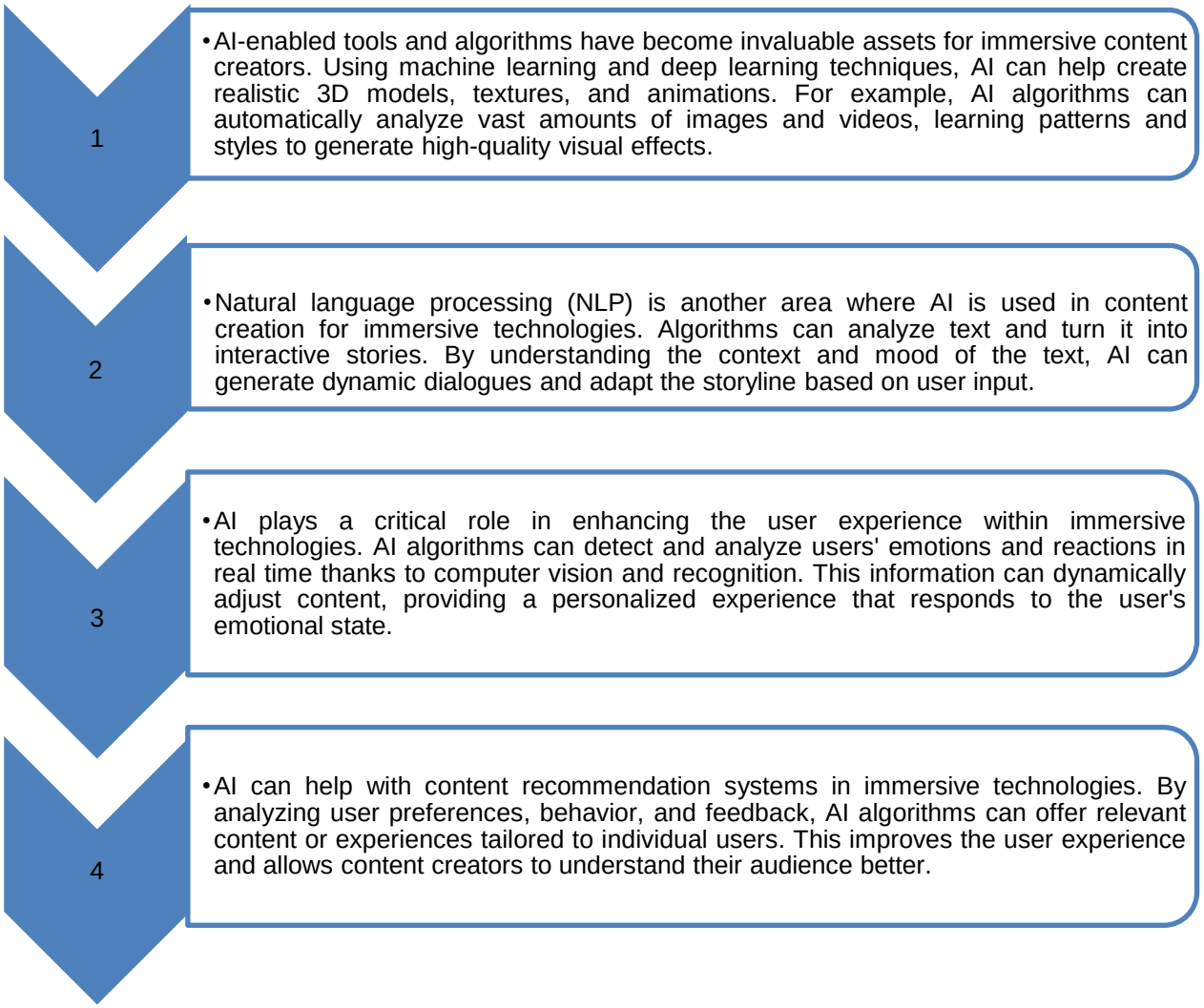
		mixed reality in educational institutions and vocational training settings. In education, it simulates historical events, providing an unprecedented immersion experience for students.
4	Extended reality (XR)	The technology is designed to combine or mirror the physical world with a "digital twin" capable of interacting with it, giving users an immersive experience of being in a virtual or augmented environment. Augmented reality can be used for collaborative efforts in the workplace, training, education, therapeutic treatment, research, and data analysis.
5	Metaverse	The term is associated with virtual reality technology and, since the early 2020s, with Web3. Information privacy, user dependency, and security are problems of the metaverse arising from the spheres of its use. Metaverse technologies have the potential to transform English lessons, connect teachers and students remotely in shared spaces, enhance professional learning, and create new opportunities for lifelong English learning.

Source: It is created on a basis (Kaplan-Rakowski & Meseberg, 2018; Carter, 2021; Tu et al., 2023; Casini, 2022).

Developing compelling and realistic content for immersive technologies used in English language learning is a complex task that requires extensive resources and expertise in various fields. This is where artificial intelligence (AI) comes in, offering innovative solutions to optimize and improve the content creation process (Figure 1).

Figure 1

Artificial intelligence tools for use in immersive technologies



Source: author's development

Artificial intelligence plays a crucial role in creating content for immersive technologies. From automatic content generation to personalized recommendations and real-time adaptation, AI empowers content creators to push the boundaries of English education and learning.

Conclusions

Therefore, the use of immersive technologies and artificial intelligence algorithms for their implementation in education in the context of the transformation of English language learning is an auspicious direction, as it allows for the increase in the effectiveness of such learning. Technologies such as virtual reality, augmented reality, mixed reality, augmented reality, and the metaverse have potential in distance education to provide the means to simulate classes in an "artificial universe" where teachers and students can be brought together in shared classrooms. All this will significantly simplify and speed up English language learning, making this process more comfortable for students and teachers.

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