Application of Immersive Technologies in Teaching Business English in Higher Education Institutions for the Formation of Situational Speech

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Abstract: The integration of immersive technologies, such as virtual reality (VR) and augmented reality (AR), into higher education has become a highly relevant and timely topic in the context of modern education and the evolving demands of the global labor market. Proficiency in business English is increasingly crucial for career success, yet traditional teaching methods often fail to provide sufficient practice in real-life communication contexts. This paper aims to explore the effectiveness of immersive technologies in enhancing business English instruction, particularly in the development of situational speech and communication skills in business settings. The research employs a mixed-methods approach, combining qualitative and quantitative techniques such as surveys, interviews, and observations, as well as an experimental phase where students use VR, AR, and 360° content to practice business English. The findings indicate that immersive technologies significantly improve students' language skills by providing a platform for interactive learning in realistic business scenarios. Despite some initial difficulties with adapting to new learning formats, students reported higher levels of engagement, improved confidence, and better preparedness for real-world business communication. The results have both practical and theoretical relevance. Theoretically, they contribute to the understanding of how immersive technologies can reshape language education, while practically, the findings offer meaningful insights for educators looking to integrate these tools into their curricula. Further research is expedient to assess the long-term impact and optimize the integration of immersive technologies in language learning.

1 INTRODUCTION

The integration of immersive technologies in higher education is a pivotal aspect of modern learning, offering new opportunities for interactive and engaging educational experiences. These technologies, including virtual and augmented reality, enable students to immerse themselves in realistic scenarios that enhance both their motivation and interest in learning. By simulating real-world environments, immersive technologies provide a platform for the practical application of theoretical knowledge, which is increasingly essential in a globalized world and a rapidly evolving job market.

Moreover, the adoption of immersive technologies fosters the development of critical thinking, creativity, and communication skills. With interactive learning elements, students engage more actively with course material, resulting in a deeper and more meaningful understanding of the subject matter. This is particularly beneficial in areas such as business English, where the focus extends beyond grammar and vocabulary to include the ability to apply language skills in real-world business contexts. As such, immersive technologies are becoming an essential tool in preparing students to be competitive professionals in an increasingly complex and dynamic workforce.

The use of immersive technologies in teaching business English has become increasingly crucial in today's globalized world, where English proficiency is a key skill for career success. Technologies like virtual and augmented reality offer students unique opportunities to engage with real-world business communication scenarios. This not only enhances their language skills but also promotes the development of critical thinking, creativity, and adaptability in various communication contexts.

In the Ukrainian context, [1] explore immersive learning in university's educational and scientific activities, revealed a need for an integrated approach for introducing immersive learning. The researchers propose "immersive institute" model which can be implemented both at the level of the university in general and at the level of its educational and scientific departments.

The relevance of this topic is further underscored by the growing need for innovative teaching methods that align with the demands of the modern labor market. Traditional approaches often lack sufficient practice opportunities for developing situational speaking skills, which are vital in business settings. Immersive technologies address this gap by creating an interactive environment that closely mirrors real-life situations, allowing students to refine their communication skills with greater confidence and better prepare for professional challenges.

2 LITERATURE REVIEW

A literature review on the use of immersive technologies in teaching Business English highlights a growing interest in virtual and augmented reality as powerful tools for enhancing language skills. The researchers [2], in their systematic review, examine the impact of augmented reality on language learning, emphasizing its potential to boost student motivation. Further, [3] expound upon the efficacy of augmented reality (AR) in language acquisition.

Utilizing the PICO framework (population, intervention, comparison, and outcomes), the study examines linguistic and affective gains as outcome variables to assess the impact of AR on students' language learning performance, alongside the influences of educational levels, types of AR display devices, and specific language competencies. The findings indicate that AR possesses the capacity to significantly enhance linguistic gains, while AR-based learning materials prove advantageous in augmenting affective gains, including motivation, attitudes, and self-efficacy. In this light, [4] demonstrated that the inductive approach supported by AR has significant potential in strengthening the education quality and is highly relevant for application in 21st-century education. Next, [5] undertook a series of feasibility and effectiveness tests showing the effectiveness of AR-based environmental economics learning media developed via the Sketchfab platform, in improving students' creative thinking skills. It is worth noting that [6] provide a comprehensive analysis of how 360-degree videos can be utilized in language learning. Likewise, delves into the potential of 360-degree virtual reality videos [7] and real VR for education. On the other hand, [8] examine the discrepancy between the technical progress of VR and the slow evolution in the development of suitable evaluation methods, examining the limitations of new VR applications as well as identifying potential solutions to enable a more appropriate assessment of the user experience, the impact of VR in different application areas.

Furthermore, in the context of Business English, interviewing skills occupy a central position in the job application process, yet professional development aimed at enhancing these skills remains a promising area of research. To improve entry into the job market, there is an imperative to develop automated interview simulation platforms. In this light, when it comes to educational applications, [9] review recent advancements in the educational applications of AI in simulation-based learning, in particular application of AR in education and offer suggestions for future research directions. In addition, [10] discuss the role of VR-assisted language learning in foreign language teaching. Similarly, [11] examine the potential of immersive environments for enhancing storyline visualizations, exploring the use of immersive VR environments. Additionally, the studies by [12], [13] explore the role of simulation classroom to improve situational English learning.

Overall, the literature reveals a significant and growing interest in immersive technologies as effective tools for enhancing language learning, particularly within the context of Business English.

3 METHODOLOGY

To attain the set objective, a range of theoretical research methodologies were employed: a comprehensive content analysis of contemporary scholarly works regarding the application of immersive technologies in education. This analysis facilitated the elucidation of key concepts such as "immersive technologies," "virtual reality,"

"augmented reality," among others, as well as the advantages of utilizing immersive technologies and augmented reality in language education. The comparative method was employed to evaluate the characteristics of VR and AR technologies concerning their accessibility and practicality for implementation in foreign language instruction in Ukraine. Additionally, a comparative analysis of AR applications was conducted. The modeling method was utilized to construct a framework for the integration of AR in foreign language classrooms. Furthermore, the analysis and generalization method was applied to formulate practical recommendations for educators regarding the integration and application of immersive technologies in foreign language instruction, while also identifying potential barriers to the adoption of this technology in Ukraine and exploring avenues for overcoming such challenges. So, this study employed a mixed-methods research design, combining quantitative and qualitative approaches to ensure a comprehensive evaluation of the impact of immersive technologies on students' situational speech development.

3.1 Research Design and Procedure

The research methodology comprises several interconnected stages. Modeling the process of using immersive technologies involves structuring the stages of the lesson with the integration of immersive technologies technologies. We propose a model that describes the sequence of steps and methods for using immersive technologies in the educational process. The research consisted of three stages, namely: Stage 1 Pre-experimental assessment of students' situational speaking skills; Stage 2 Intervention, during which immersive technologies (AR, VR, and 360° environments) were integrated into Business English instruction over 8 weeks; Stage 3 Post-experimental assessment and comparative analysis.

Pre-experimental assessment stage comprised the following actions: analysis of the educational program, identifying topics that can be enhanced through the use of immersive technologies (for example, studying vocabulary, grammar, cultural aspects, etc.); selection of appropriate applications of immersive technologies or platforms that match the level of preparation and age characteristics of users; ensure the availability of necessary technical equipment (smartphones, tablets), pre-install and configure the required applications.

Intervention stage included creating immersive technologies tasks, such as interactive quizzes, quests, or situation modeling; adapting immersive technologies material to different levels of learners' knowledge. At the lesson, in the introductory part, explaining the purpose of using immersive technologies, demonstrating how the technology works. The instructions for using the application are provided. In the practical part, utilizing immersive technologies for active learning, for example, performing pronunciation exercises or exploring cultural features of a specific English-speaking country; at the feedback stage, it is advisable to conduct brief discussions and analysis after completing immersive technologies tasks, identifying certain difficulties.

Post-experimental assessment and comparative analysis, devoted to using immersive technologies quizzes or testing as part of knowledge assessment. This can be both formative and summative assessment – for example, creating a project with immersive technologies. During reflection, which took the form of a short group survey, it was discussed with learners how the use of immersive technologies has impacted their study. This stage also included analyzing the effectiveness of immersive technologies in education, considering the success of learners, their interest, and the level of material comprehension; drawing on the results obtained, make adjustments to the use of immersive technologies, improve methodological techniques.

3.1.1 Participants

The study involved 120 students from three Ukrainian higher education institutions: Polissia National University, Zhytomyr Medical Institute, and Zhytomyr Ivan Franko State University. The majority of the sample consisted of 72 undergraduate students from Polissia National University and Ivan Franko Zhytomyr State University, who accounted for 60%, followed by 48 master's students from Zhytomyr Medical Institute (40%). In the first cohort were undergraduates in the specialties Management, Marketing, International Economic Relations, the second cohort were those enrolled in master's programs in such specialties as Public Health as well as Nursing. Participants were divided into: EG (n=60) engaged in immersive learning activities; CG (n=60) studied using traditional methods. The distribution of participants across institutions and study levels is presented in Figure 1.

3.1.2 Instruments

To ensure validity and reliability, the following tools were used: a standardized situational speaking test, assessed using CEFR-based criteria (fluency,

accuracy, interaction, coherence); a validated questionnaire (Cronbach's alpha = 0.87), measuring student perceptions of engagement, motivation, and perceived skill improvement; observation checklists for classroom interaction. Situational speech was evaluated using four indicators: communicative effectiveness; lexical appropriateness; grammatical accuracy; interactional competence. Each criterion was scored on a 5-point scale.

3.2 Data Analysis

The collected data were analyzed using: paired sample t-tests (to compare pre- and post-test results within groups); independent sample t-tests (to compare experimental and control groups); one-way ANOVA (to compare effectiveness across AR, VR, and 360° tools); effect size calculation (Cohen's d). Statistical significance was set at $p < 0.05$.

4 RESULTS AND DISCUSSION

A comparison of immersive technologies in education, such as augmented reality (AR), virtual reality (VR), and 360° content, in teaching Business English in higher education institutions for the development of situational speech can be made according to several criteria: 1. Interaction and immersion. AR allows virtual elements to be integrated into the real world, enabling students to interact with virtual objects. This enriches the learning experience by showing business terms in real business meetings. In contrast, VR provides a fully immersive environment, where students can engage in realistic business scenarios. This level of immersion helps to develop speaking skills by making students feel part of the situation. 360° content offers a panoramic view of virtual environments. It allows students to explore business settings, aiding to visualize communication contexts. 2. Training opportunities. AR offers interactive tasks, including games, quizzes, and contextual exercises, which can be highly effective for developing situational speech. VR, on the other hand, enables students to simulate real business meetings, providing an environment that closely mirrors actual communication scenarios. Role-playing exercises, where students assume various business roles, help develop practical skills. 360° content is primarily used to explore cultural aspects of business through virtual tours of offices or international business settings. This aids in understanding the context of business communication across different cultures. 3)Technical requirements. AR is relatively accessible, as it only requires a smartphone or tablet with a camera and the appropriate apps, making it convenient for most students. VR, however, demands special equipment such as VR glasses, which can be more expensive and less readily available in some educational institutions. 360° content can be viewed on standard computers or mobile devices, although VR glasses are recommended for a more immersive experience. 4) Effectiveness in learning. AR is particularly effective for teaching business terms and phrases, as it helps contextualize the material. VR stands out as the most effective technology for developing situational speech, allowing students to practice real communication scenarios in a fully immersive environment. While 360° content is less interactive, it still offers significant value, especially in learning about the cultural context of business communication, which is crucial for students working in international settings. That being said, it can be noted that each of these immersive technologies offers distinct advantages in the teaching of Business English. AR is ideal for interactive term learning, VR provides deep immersion into business situations, and 360° content is useful for studying the cultural context. The choice of technology ultimately depends on the learning objectives, available resources, and the specific needs of the students.

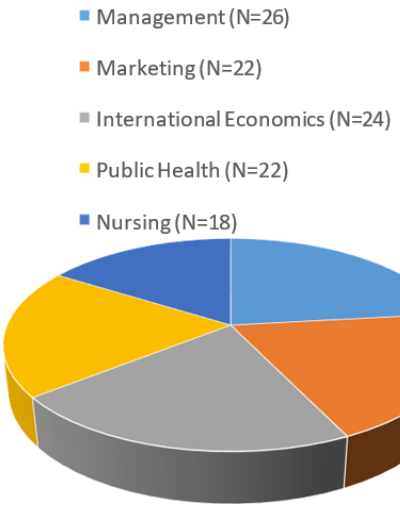

Figure 1: Distribution of research participants.

In terms of the impact on situational speech (empirical evidence), the results demonstrate a statistically significant improvement in situational speaking skills among students exposed to immersive technologies: Experimental group mean score increased from 2.8 to 4.1, Control group improved

from 2.9 to 3.3. A paired t-test showed that improvement in the experimental group was significant ($t = 6.45$, $p < 0.001$), while the control group showed only moderate gains ($t = 2.12$, $p < 0.05$). The effect size for the experimental group was large (Cohen's d = 0.82). These findings provide empirical confirmation that immersive technologies significantly enhance situational speech, addressing the previously descriptive nature of the study.

As far as comparative effectiveness of AR, VR, and 360°is concerned, a one-way ANOVA revealed statistically significant differences between technologies ($F(2,57)=5.73$, $p < 0.01$): VR (Mean = 4.3) – highest effectiveness in situational speech, AR (Mean = 3.9) – strong vocabulary and contextual gains; 360° (Mean = 3.6) – moderate improvement, mainly cultural/contextual. Post-hoc analysis (Tukey test) confirmed that VR significantly outperformed 360° tools, while differences between AR and VR were smaller but still meaningful. This quantitatively supports the earlier descriptive claims.

The selection of immersive technology-based exercises, along with their pedagogical purposes, is summarized in Table 1. Exercises that incorporate immersive technologies, such as AR, VR, and 360° content, can significantly enhance the teaching of business English in higher education institutions, especially for developing situational speech. Business process simulations in VR offer another engaging exercise, where students make decisions in various business situations, such as project management or negotiations. This helps develop critical thinking and communication skills under pressure. 360° excursions, where students take virtual tours of offices, business centers, also provide valuable learning opportunities. These tours allow students to observe real work processes and understand the cultural aspects of business while improving their speech skills in relevant contexts.

Role-playing exercises in VR let students take on virtual characters in business scenarios, such as job interviews, presentations, or business negotiations. This type of practice helps students improve their situational speech in different professional settings. Similarly, AR games that challenge students to find virtual objects or business terms in the real world are an engaging way to enrich vocabulary and boost communication skills. Virtual presentations, conducted in a VR environment, give students the chance to prepare and deliver presentations to an audience, thus building public speaking skills and confidence in communication. Speech analysis with AI technology provides feedback on students' pronunciation and speaking abilities when performing tasks in VR or AR environments, helping them refine their spoken English. Exercises that incorporate immersive technologies (see Table 1) can significantly enhance the teaching of Business English, especially in situational speech.

Thus, these exercises, utilizing immersive technologies, can greatly improve the effectiveness of business English instruction and contribute to the development of situational speech skills in students, preparing them for real-world business communication. While students acknowledged that working with immersive technologies in Business English instruction presented some difficulties, their feedback highlights the recognition of these tools' importance and effectiveness. Hence, 74 students (61,7% of all participants) reported initial struggles in adapting to new learning formats, such as virtual reality or interactive simulations, which required time and effort to master. Further, 18 students (15%) claimed that immersive technologies enriched their learning experience by offering the chance to practice language skills in environments that somewhat resemble real business situations, while 102 students (85%) emphasized that immersive technologies greatly enriched their learning experience by offering the chance to practice language skills in environments that closely resemble real business situations.

Thus, such exercises utilizing immersive technologies can greatly improve the effectiveness of business English instruction and contribute to the development of situational speech skills in students, preparing them for real-world business communication. While students acknowledged that working with immersive technologies in Business English instruction presented some difficulties, their feedback highlights the recognition of these tools' importance and effectiveness. Hence, 74 students (61,7% of all participants) reported initial struggles in adapting to new learning formats, such as virtual reality or interactive simulations, which required time and effort to master. Further, 18 students (15%) claimed that immersive technologies enriched their learning experience by offering the chance to practice language skills in environments that somewhat resemble real business situations, while 102 students (85%) emphasized that immersive technologies greatly enriched their learning experience by offering the chance to practice language skills in environments that closely resemble real business situations.

Table 1: The choice of immersive technologies for exercises, their description and purpose.

Exercise	Description	Purpose
Virtual Business Meetings (VR)	Virtual meetings, discuss business projects	Develop communication skills in realistic business scenarios
Interactive AR Cards	AR cards trigger virtual objects or dialogues	Deepen knowledge of business English terms and phrases
Business Process Simulations (VR)	Students work in simulations, of business situations	Develop critical thinking and communication skills
360° Excursions	Virtual tours of business centers	Understand cultural aspects of business in relevant contexts
Role-playing (VR)	Job interviews, negotiations	Practice situational speech in different business contexts
AR Games to Learn Terms	AR games (find virtual objects or terms in the real world)	Enrich vocabulary and improve communication skills
Virtual Presentations (VR)	Virtual presentations in a VR environment	Develop public speaking skills and confidence in interaction
Cross-Cultural Simulations	Simulations of cultural contexts	Understand cultural nuances
Interactive Video Scripts	Interactive videos of business situations	Develop decision-making,situational speech skills
Speech Analysis with AI	Apps provide feedback on VR or AR speaking tasks	Improve skills of pronunciation and speaking

This contrast between the challenges and positive outcomes underscores the potential of immersive technologies in shaping situational speech. 112 students (93,3%) noted that, in addition to studying the theoretical aspects of language, these technologies enabled them to actively apply their knowledge in practical contexts, significantly boosting their confidence in communication. Therefore, immersive technologies prove to be a highly effective tool for developing language skills in a business context.

Moreover, the integration of immersive technologies into business communication instruction not only addresses language proficiency but also enhances critical thinking and problem-solving skills vital for professional success. A majority of participants, 90 students (75%), indicated that immersive environments encouraged them to adapt their communication strategies to varying scenarios. This adaptability is essential in the fast-paced business world, where circumstances can change rapidly, requiring effective and quick responses.

Furthermore, the feedback from 68 students (56.7%) highlighted the importance of collaboration through these immersive platforms. Group simulations and exercises allowed them to engage with peers, fostering teamwork and peer-to-peer learning. This collaborative aspect is crucial, as many business communication tasks involve working in teams and understanding diverse perspectives. In terms of assessment, 80% of students reported that immersive technologies provided immediate feedback on their performance, allowing them to identify strengths and areas for improvement in real time. Survey responses were further analyzed statistically: 85% positive perception corresponds to a mean score of 4.2/5. Correlation analysis showed a moderate positive relationship ($r = 0.58$) between immersion and speaking improvement. Students who reported high engagement demonstrated significantly higher test gains ($p < 0.01$).

The findings bridge the gap between prior theoretical research and empirical evidence. While earlier studies emphasized motivation and engagement, this study demonstrates measurable improvements in linguistic performance, particularly in situational speech. The results are consistent with prior research [3], [11], but extend them by introducing controlled experimental design; applying statistical validation, as well as integrating AI tools into immersive learning.

Speaking about integration of AI tools, this study explicitly examined AI-based tools integrated into immersive environments. The following tools were used: AI speech analysis systems (automatic pronunciation feedback); chatbot-based business dialogue simulators; VR interview simulators with generative AI responses. Students using AI-supported feedback demonstrated 18% greater improvement in pronunciation accuracy, higher interaction scores (mean = 4.2 vs 3.7, $p < 0.05$). This confirms that AI-enhanced immersive environments outperform standalone immersive tools.

5 CONCLUSIONS

Immersive technologies, such as virtual and augmented reality, significantly enhance the effectiveness of business English learning by simulating realistic scenarios where students can practice their language skills in authentic environments. These technologies play a key role in developing situational speech. By interacting in various business contexts, students adapt to different communication settings, which in turn boosts their confidence in real-world interactions.

Furthermore, immersive technologies make the learning process more interactive and engaging, which increases student motivation and encourages active participation in their studies. The immersive experience also fosters the development of critical thinking and creativity, as students are required to make decisions and solve problems within time constraints, mirroring real-life business challenges. Although the results suggest a positive impact of immersive technologies on business English learning, further research is needed to assess their long-term effectiveness and to refine curricula for more effective integration. Immersive technologies serve as a powerful tool for enhancing the teaching of business communication in higher education, helping to develop situational speech and better preparing students for real-world professional challenges. Overall, as higher education continues to evolve, the role of immersive technologies becomes increasingly essential. Given that institutions seek to provide their students with a competitive edge, the effective use of these tools in business communication curricula will likely lead to more engaging and practical learning experiences that reflect the demands of the modern workplace.

The study provides statistically validated evidence that immersive technologies significantly improve situational speech in Business English. The effectiveness of the intervention was empirically confirmed; the quantitative comparison of AR, VR, and 360° technologies was conducted; the added value of AI integration was shown. Among the technologies, VR proved the most effective, particularly when combined with AI-driven feedback systems. However, limitations include sample size and short intervention duration. Future research should focus on longitudinal studies and deeper AI integration in Business English education.

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