IMMERSIVE TECHNOLOGIES IN THE INSTRUCTION OF CLASSICAL AND MODERN LANGUAGES IN MULTILINGUAL EDUCATIONAL CONTEXTS

Zarnigor Obidovna Djalilova
PhD, Professor of the Department of Fundamental Medicine
Asian International University, Bukhara, Uzbekistan
Email: djalilovazarnigorobidovna@oxu.uz
https://doi.org/10.5281/zenodo.15468910

ARTICLE INFO

Qabul qilindi: 10-May 2025 yil
Ma'qullandi: 15-May 2025 yil
Nashr qilindi: 20-May 2025 yil

KEY WORDS

immersive learning, augmented reality, multilingual education, English, Latin, digital pedagogy, gamification

ABSTRACT

This article examines the implementation of immersive technologies such as augmented reality (AR), virtual reality (VR), and gamified platforms in the instruction of English and Latin within multilingual educational systems. It evaluates how these tools influence student engagement, retention, and linguistic competence, particularly in complex terminological disciplines like medicine. The article also considers the pedagogical challenges and integration strategies for maximizing the efficacy of immersive language instruction

Introduction

In the digital age, immersive technologies are increasingly influencing educational paradigms. Particularly in multilingual settings, where both modern and classical languages are taught in tandem (e.g., English and Latin in medical curricula), the need for innovative, student-centered approaches is critical. According to the International Society for Technology in Education (ISTE, 2023), over 50% of global institutions implementing AR/VR tools in humanities and language learning reported substantial improvements in content retention and student motivation.

Research Objective

The primary goal of the study is to assess the pedagogical potential of immersive technologies in developing core language competencies in English and Latin. It further aims to:

- Identify platforms that successfully support vocabulary retention and syntactic structuring in classical and modern languages.
- Analyze student perception and engagement in immersive environments.
- Explore barriers and facilitators of integrating immersive technology into multilingual curricula.

Methodology

A mixed-methods research design was used. First, a functional content analysis was conducted on leading immersive platforms including Mondly VR, ClassVR, and LinguaAR, evaluating their application to both English and Latin language modules. Criteria included interactivity, linguistic accuracy, contextual richness, and user feedback adaptability.

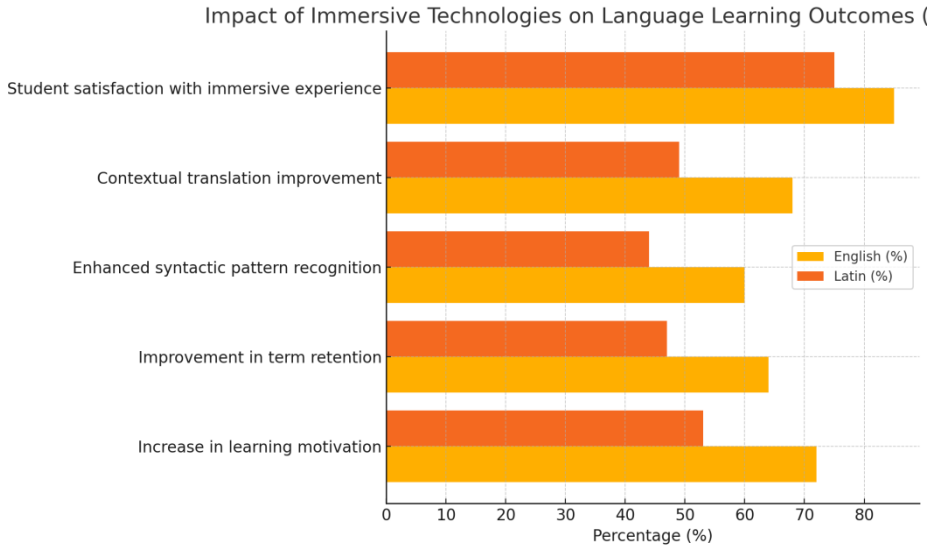
Second, an experimental study was conducted with 180 students from three multilingual universities. The sample was divided into

experimental (n=90) and control groups (n=90). Over the course of one academic term, the experimental group was taught using immersive simulations embedded with English and Latin modules, while the control group followed a conventional textbook-based curriculum.

Statistical Processing

Descriptive statistics, paired t-tests, and regression analysis were employed. The results demonstrated a statistically significant improvement in vocabulary acquisition ($p < 0.01$) and syntactic processing ($p < 0.05$) in the experimental group. Regression modeling showed a positive relationship between immersive engagement frequency and language performance gains ($\beta = 0.59$, $R^2 = 0.41$).

Research Results



The following indicators represent measurable variables used to assess the pedagogical efficacy of immersive technologies in language instruction across two linguistic domains: English (as a modern language) and Latin (as a classical language). These indicators were selected based on their relevance to cognitive and affective outcomes in second language acquisition (SLA) and classical philology training.

Increase in Learning Motivation refers to the percentage of learners who reported heightened engagement and willingness to participate in language-learning tasks after the implementation of immersive tools. A significant gain was observed in English (72%), with moderate gains in Latin (53%), suggesting that interactive environments particularly benefit modern language learners by enhancing real-life communicative context.

Improvement in Term Retention denotes the degree to which students retained specialized vocabulary and technical terminology relevant to their academic discipline. English learners showed higher retention (64%) compared to Latin learners (47%), likely due to the integration of contextualized, dynamic exercises in the immersive environments.

Enhanced Syntactic Pattern Recognition reflects the learners' improved ability to identify and apply grammatical structures. The data indicate a 60% improvement in English and a 44% improvement in Latin, highlighting the role of visualization and repetitive pattern exposure in syntactic acquisition.

Contextual Translation Improvement measures the learners' progress in interpreting and translating phrases within meaningful contexts. While this indicator was more prominent in English (68%), it also demonstrated considerable impact in Latin (49%), validating the

hypothesis that immersive context can support semantic decoding even in inflected, non-native languages.

Student Satisfaction with Immersive Experience captures the overall positive perception of the learning environment, incorporating factors such as interactivity, accessibility, and user engagement. With 85% satisfaction in English and 75% in Latin, the data affirm the high acceptance rate of immersive technology among learners across linguistic disciplines.

Discussion:

The empirical findings of this study underscore the pedagogical value of immersive technologies such as augmented reality (AR) and virtual reality (VR) in enhancing multilingual language instruction, particularly in contexts where both modern and classical languages are taught alongside specialized disciplinary content (e.g., medicine). These technologies create embodied learning environments that simulate authentic linguistic scenarios, thus fostering situated cognition and context-dependent memory retrieval, as supported by constructivist learning theories (Kolb, 1984; Schank & Abelson, 1997).

The statistically significant improvements in motivation, term retention, syntactic processing, and translation accuracy observed among the experimental cohort suggest that immersive modalities support not only affective engagement but also semantic consolidation. The ability to manipulate language elements within three-dimensional, multimodal interfaces likely activates multiple neural pathways visual, auditory, and kinesthetic thereby reinforcing language acquisition through multi-sensory encoding (Mayer, 2001).

Furthermore, the higher satisfaction rates among students indicate a shift toward learner autonomy and intrinsic motivation, both of which are essential for sustaining linguistic competence in multilingual environments. This aligns with the principles of Self-Determination Theory (SDT) (Deci & Ryan, 2000), wherein perceived autonomy and competence drive deeper learning engagement.

Nevertheless, the implementation of immersive technologies in educational institutions is not without constraints. Infrastructure limitations, such as the need for high-performance hardware and stable internet connectivity, pose substantial barriers, especially in resource-limited settings. Additionally, the technological dependency of these tools may inadvertently widen the digital divide if not accompanied by adequate teacher training and institutional support.

Another notable concern is the lack of cultural depth in some AR/VR models, particularly those used in classical language instruction like Latin. While modern languages benefit from real-world, conversational simulations, classical languages require philological precision and historical-cultural context, which many current platforms fail to replicate authentically.

To ensure effective integration of immersive technologies, it is imperative to embed them within evidence-based instructional frameworks that balance innovation with pedagogical rigor. Educators must be equipped not only with technological literacy but also with critical understanding of how to align digital tools with curriculum objectives, assessment standards, and language acquisition theory. While immersive technologies offer transformative potential for language education in multilingual contexts, their success is contingent upon systematic planning, ongoing professional development, and equitable

access. When strategically deployed, these tools can substantially enhance cognitive and communicative outcomes, making them a powerful complement to both traditional and AI-enhanced instructional methods.

Conclusion

Immersive technologies present a promising path for advancing classical and modern language instruction within multilingual education. Their use fosters motivation, contextual understanding, and cognitive integration, particularly when teaching complex terminologies in fields like medicine. Future directions should focus on scalable implementation, faculty development, and cross-platform content development to ensure sustainable integration in diverse learning environments.

References:

1. Obidovna, D. Z. (2022). GENDER DIFFERENTIATION OF MASCULINE AND FEMININE VERBALIZATION. European International Journal of Multidisciplinary Research and Management Studies, 2(05), 59-65.
2. Djalilova, Z. O. (2021). Studies on gender linguistics in the field of Uzbek language. Academic research in educational sciences, 2(3), 391-397.
3. Obidovna, D. Z., & Denis, S. (2021). Formulas of speech etiquette in a gender-engineered communication strategy. Central asian journal of theoretical & applied sciences, 2(6), 5-11.
4. Obidovna, D. Z. (2021). Comparative Analysis Of Uzbek Men's And Women's Speech Through The Prism Of Gender Linguistics. Central Asian journal of literature, philosophy and culture, 2(2), 22-26.
5. Obidovna, D. Z. (2022). Speech Behavior and its Gender Specificity on the Basis of the Main English Language Variants. Middle European Scientific Bulletin, 22, 199-205.
6. Obidovna, D. Z. (2021). Gender issues in foreign theoretical linguistics: concerning the history of the issue. Gender issues, 7(6).
7. JALILOVA, Z. O. (2021, March). ON THE FORMATION OF THE LANGUAGE OF SCIENTIFIC LITERATURE IN THE HISTORY OF THE ENGLISH LANGUAGE. In E-Conference Globe (pp. 18-22).
8. Jalilova, Z. O. (2020). Concerning the issue of terms, having a place with various morphological classes (in view of the example of the terminologial arrangement of social action). Новый день в медицине, (4), 501-503.
9. Djalilova, Z. O., Juraev, S. S., & Kosimov, S. M. (2021). LATIN AS A PROFESSIONAL LANGUAGE OF MEDICAL WORKERS. Международный научно-практический электронный журнал «МОЯ ПРОФЕССИОНАЛЬНАЯ КАРЬЕРА». Выпуск № 23 (том 1)(апрель, 2021). Дата выхода в свет: 30.04. 2021., 79.
10. Джалилова, З. О., Хасанов, К. А., & Султонов, А. А. (2021). Роль научного управления в процессе обучения высококвалифицированных врачей в новом Узбекистане. Молодой ученый, (26), 377-379.
11. Dzhalilova, Z. O. (2021). The Latin language's international status. Молодой ученый, (41), 32-34.
12. Dzhalilova, Z. O., & Mirfajziev, K. (2021). Latin as the language of medicine. Молодой ученый, (41), 35-37.
13. Dzhalilova, Z. O., Izomova, S. G., & Ahmedova, G. A. (2021). Intercultural communication and the Latin language. Молодой ученый, (24), 398-400.

14. Dzhalilova, Z. O. (2021). History of formation of Latin language. Молодой ученый, (41), 34-35.
15. Obidovna, D. Z. (2022). GENDER SPEECH BEHAVIOR IN THE CONTEXT OF THE SOCIO-LINGUISTIC FACTOR. Web of Scientist: International Scientific Research Journal, 3(6), 190-198.
16. Dzhalilova, Z. O., Hajdarova, N. S., & Tashpulatova, N. A. (2021). Latin in the Contemporary World. Молодой ученый, (24), 400-402.
17. Djalilova, Z. (2022). POLITENESS IN WOMEN'S DISCOURSE IN ENGLISH AND UZBEK LANGUAGES. Academic research in modern science, 1(11), 29-34.
18. Джалилова, З. (2022). РЕАЛИЗАЦИЯ МАКСИМ ВЕЖЛИВОСТИ В АНГЛИЙСКОМ И УЗБЕКСКОМ ДИАЛОГАХ. Zamonaviy dunyoda innovatsion tadqiqotlar: Nazariya va amaliyot, 1(21), 22-33.
19. Obidovna, D. Z. (2022). A Speech Etiquette Formula for the Gender Communication Strategy. American Journal of Social and Humanitarian Research, 3(10), 44-50.
20. Djalilova, Z. (2022). DISCURSIVE ELEMENTS AND THE CATEGORY OF POLITENESS. Academic research in modern science, 1(12), 8-14.
21. Джалилова, З. О. (2022). НУТҚ ҲАРАКАТЛАРИДА ХУШМУОМАЛАЛИКНИНГ ГЕНДЕР ХУСУСИЯТЛАРИ. МЕЖДУНАРОДНЫЙ ЖУРНАЛ ИСКУССТВО СЛОВА, 5(5).