

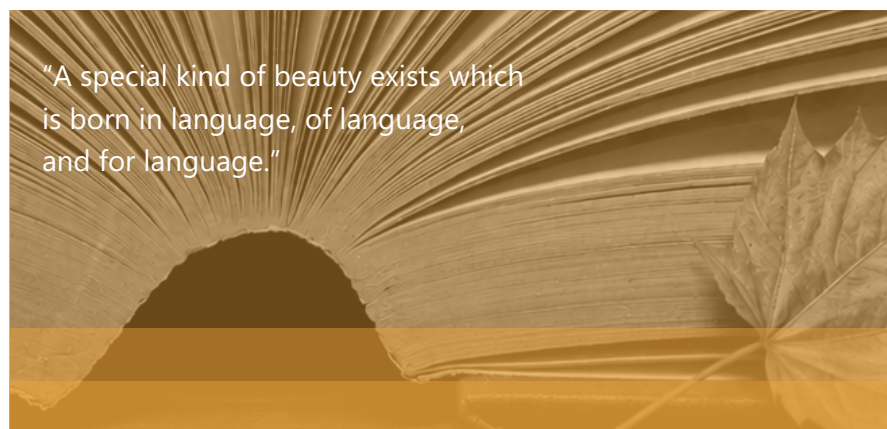


VOLUME 9, SEPTEMBER 2026

ISSN: 3060-4958



"A special kind of beauty exists which
is born in language, of language,
and for language."



**UZBEKISTAN STATE WORLD
LANGUAGES UNIVERSITY**

MORE INFO:

www.lingvospektr.uz



t.me/thelinguaspectrum



Amanov A.A.	Didactic principles of using authentic materials in developing future translators' intercultural communicative competence	302
Akbarova M.R.	Developing English communicative competence of music students through profession-oriented language teaching	309
Xoldorova Sh.Sh.	Post-digital methodology: a "Virtuo-real" approach to developing English language communicative competence in VR environments	320
Normatova N.T.	A comparative analysis of national and international experiences in developing the lexical competence of 11th grade students	326
Rakhmonov A.B.	Methodology for developing the Russian communicative competence of Uzbek-speaking students using generative artificial intelligence	333
Rakhmonov A.B.	Microlearning as a modern technology of teaching Russian as a foreign language	343
Kadyrova M.B.	Methodology for improving students' intellectual-communicative competence through artificial intelligence in inclusive education	350
TRANSLATION		362
Akifeva O.O.	The Golden Color Image in S.A. Yesenin's Poetry and the Problem of Its Rendering in Uzbek Translation	363
Sheraliyeva D.AI.	Linguistic challenges in translating information security terms from English into Uzbek	370
Abdullayeva Sh.N.	Functional Criteria for Preserving National Colour and Cultural Adaptation in Literary Translation	376
Bakhronova D.K., Ramazonova V.	AI-assisted translation of cultural-emotional meaning in Spanish, Uzbek, and English: issues of equivalence and human mediation	384
Allamova M.Q.	Direct and multi-level machine translation: Korean-Uzbek and Korean-English-Uzbek language pairs	393
Mirzohidova N.U.	The study of translations of William Shakespeare's works in Uzbekistan: historical stages and research directions	404
HISTORY		415
Zamonov Z.T.	Historical evolution of the self-government body: socio-political and spiritual aspects	416
Zamonova L.	The education of a perfect human being and moral education in Ahmad Donish's didactic views	427
CONTENTS		434

Post-digital methodology: a “Virtuo-real” approach to developing English language communicative competence in VR environments

Xoldorova Shahlo Shuhratjon qizi

xoldorovashaxloxon11@gmail.com

Lecturer, “Foreign Languages” Department,
Namangan State Technical University

Annotation

The rapid emergence of immersive technologies necessitates a shift from traditional Computer-Assisted Language Learning (CALL) to post-digital pedagogical frameworks. This article introduces and empirically validates the “Virtuo-Real Approach,” a methodology integrating Virtual Reality (VR) immersive practice with structured real-world reflective transfer to develop English as a Foreign Language (EFL) communicative competence. Employing a quasi-experimental design, 60 intermediate EFL university students were divided into control (traditional multimedia) and experimental (Virtuo-Real VR) groups over a 12-week period. Data collected via communicative competence tests, the Metacognitive Awareness Inventory (MAI), and semi-structured interviews revealed that the experimental group achieved significantly higher gains in sociolinguistic and strategic competence, alongside a marked reduction in foreign language anxiety. The study concludes that bridging virtual immersive practice with real-world reflection fosters deeper cognitive engagement and autonomous learning, offering a viable alternative to traditional summative testing. Furthermore, the findings highlight the pedagogical potential of immersive environments for promoting meaningful interaction, learner agency, reflective practice, and sustainable communicative development within contemporary technology-enhanced foreign language education contexts and settings.

Keywords

Post-digital pedagogy, virtual reality, communicative competence, embodied cognition, EFL

Postdigital metodologiya: VR muhitida ingliz tili kommunikativ kompetensiyasini rivojlantirishning “Virtuo-real” yondashuvi

Xoldorova Shahlo Shuhratjon qizi

xoldorovashaxloxon11@gmail.com

“Xorijiy tillar” kafedrası o'qituvchisi,
Namangan davlat texnika universiteti

Annotatsiya

Immersion texnologiyalarning jadal rivojlanishi an'anaviy kompyuter yordamida til o'rgatish (CALL) dan postdigital pedagogik freymvorklarga o'tishni taqozo etadi. Ushbu maqola “Virtuo-Real yondashuvi” ni taqdim etadi va empirik asoslaydi. Ushbu metodologiya virtual reallik (VR) immersion amaliyotini ingliz tili kommunikativ kompetensiyasini rivojlantirish uchun real dunyodagi refleksiv transfer bilan birlashtiradi. Kvazi-eksperimental dizayn asosida 60 nafar o'rta darajadagi EFL universitet talabalari 12 hafta davomida nazorat (an'anaviy multimedia) va eksperimental (Virtuo-Real VR) guruhlariga bo'lindi. Kommunikativ kompetensiya testlari, Metakognitiv xabardorlik inventari (MAI) va yarim tuzilgan

intervyular orqali to'plangan ma'lumotlar eksperimental guruh sotsiolingvistik va strategik kompetensiyada sezilarli yuqori natijalarga erishganini, shuningdek, chet tili ansixietasi sezilarli kamayganini ko'rsatdi. Tadqiqot virtual immersion amaliyotni real dunyo refleksiyasi bilan bog'lash chuqur kognitiv jalb qilish va avtonom o'rganishni ta'minlaydi, an'anaviy summativ testlashga muqobil variantni taklif etadi, degan xulosaga keladi. Bundan tashqari, tadqiqot natijalari immersiv muhitlarning mazmunli muloqot, o'rganuvchi mustaqilligi, reflektiv amaliyot hamda zamonaviy texnologiyalar bilan boyitilgan chet tili ta'limi sharoitida barqaror kommunikativ rivojlanishni ta'minlashdagi pedagogik imkoniyatlarini ko'rsatadi.

Kalit so'zlar *Postdigital pedagogika, virtual reallik, kommunikativ kompetensiya, mujassamlangan kognitsiya, EFL*

Постцифровая методология: «виртуо-реальный» подход к развитию коммуникативной компетенции по английскому языку в VR-среде

Холдорова Шахло Шухратжон кизи
xoldorovashaxloxon11@gmail.com
Преподаватель кафедры «Иностранные
языки»,
Наманганский государственный
технический университет

Аннотация *Стремительное развитие иммерсивных технологий требует перехода от традиционного компьютерного обучения языку (CALL) к постцифровым педагогическим фреймворкам. В данной статье представлен и эмпирически обоснован «Виртуо-Реальный подход» – методология, объединяющая иммерсивную практику в виртуальной реальности (VR) со структурированным рефлексивным переносом в реальный мир для развития коммуникативной компетенции в английском как иностранном языке (EFL). В рамках квазиэкспериментального дизайна 60 студентов среднего уровня EFL были разделены на контрольную (традиционные мультимедиа) и экспериментальную (Virtuo-Real VR) группы на 12 недель. Данные, собранные с помощью тестов коммуникативной компетенции, Метакогнитивного опросника осознанности (MAI) и полуструктурированных интервью, показали, что экспериментальная группа достигла значительно более высоких результатов в социолингвистической и стратегической компетенциях, а также заметного снижения тревожности при изучении иностранного языка. Исследование приходит к выводу, что соединение виртуальной иммерсивной практики с рефлексией в реальном мире способствует более глубокой когнитивной вовлечённости и автономному обучению, предлагая жизнеспособную альтернативу традиционному суммативному тестированию. Кроме того, результаты исследования подчёркивают педагогический потенциал иммерсивной среды для развития содержательного взаимодействия, самостоятельности обучающихся, рефлексивной практики и устойчивого развития коммуникативной компетенции в условиях современного технологически обогащённого обучения иностранным языкам.*

Ключевые слова *Постцифровая педагогика, виртуальная реальность, коммуникативная компетенция, воплощённое познание, EFL*

Introduction

The integration of technology into language education has evolved from behaviorist drill-and-practice to integrative mobile-assisted learning. However, the current "post-digital condition" demands a fundamental reconceptualization of how technology mediates language learning. In this paradigm, the distinction between "digital" and "physical" learning spaces becomes irrelevant; instead, they form a continuous ecology of learning (Jandrić et al., 2022).

Despite growing interest in Virtual Reality (VR) for language learning, critical gaps persist: (1) technological determinism, where VR is assumed inherently superior without pedagogical grounding; (2) the "transfer problem," where skills acquired in VR fail to translate to real-world contexts; and (3) a lack of frameworks addressing embodied cognition in language acquisition.

This article addresses these gaps by proposing the **"Virtuo-Real Approach"**. This framework conceptualizes VR not as a replacement for the physical classroom, but as a "third space" (Bhabha, 1994) where learners develop competence through embodied practice, followed by explicit reflective bridging to real-world application.

Research Questions:

1. How does the Virtuo-Real Approach affect EFL learners' communicative competence compared to traditional multimedia instruction?
2. To what extent does immersive VR presence correlate with reduced foreign language anxiety and increased willingness to communicate (WTC)?

Theoretical framework

Post-Digital pedagogy and embodied cognition. Post-digital pedagogy rejects the

notion of technology as a mere external tool. Instead, it recognizes that digital and physical dimensions are entangled. Traditional cognitive models treat language as abstract symbol manipulation. Conversely, embodied cognition theory posits that linguistic understanding is grounded in sensorimotor experience (Lakoff and Johnson, 1999). VR environments, by providing rich multimodal stimuli and spatial interaction, activate embodied cognitive processes that 2D screens cannot access (Slater and Sanchez-Vives, 2016).

The Virtuo-Real conceptual model. The proposed framework rests on three core principles:

1. *Embodied presence:* Learning occurs through full sensory and motor engagement in ecologically valid virtual scenarios.
2. *Reflective bridging:* Structured metacognitive reflection (e.g., error logs, strategy mapping) connects virtual practice to real-world schemas.
3. *Iterative cycling:* Learners move repeatedly between VR simulation, real-world application, and self-evaluation, transforming assessment from a terminal judgment into a continuous cognitive tool.

Materials and Methods

Research design and participants. A quasi-experimental mixed-methods design was employed at Namangan State Technical University, Uzbekistan, over 12 weeks. Sixty intermediate-level (B1–B2) EFL students (ages 19–22) were randomly assigned to:

- *Experimental Group (EG, n=30):* Received Virtuo-Real Approach instruction.
- *Control Group (CG, n=30):* Received traditional multimedia instruction

(videos, interactive whiteboards, standard apps).

Intervention procedure. The EG participated in 3 hours/week structured as follows:

Immersive practice (2 hrs): VR scenarios (virtual café, business negotiation, cultural exchange) using Meta Quest headsets, featuring spatial audio and AI-driven conversational agents. *Reflective bridging and transfer (1 hr):* Video review of VR interactions, pragmatic error analysis, and real-world tasks (e.g., conversing with native speakers via video call, applying learned strategies in authentic settings).

The VR scenarios were carefully scaffolded across the 12 weeks to ensure progressive cognitive and linguistic demand. Weeks 1–4 focused on a “Virtual Café” scenario (transactional interactions, handling misunderstandings, and polite requests); Weeks 5–8 introduced a “Business Negotiation” scenario (formal register, persuasive language, and turn-taking); and Weeks 9–12 culminated in a “Cultural Exchange” scenario (navigating a virtual city and engaging in open-ended dialogue with an AI-driven native speaker agent). The Reflective Bridging phase utilized a structured digital journal where students answered targeted metacognitive prompts (e.g., ‘What pragmatic strategy did you use when the AI agent did not understand you?’),

‘How will you adapt this phrasing for a real-world conversation with your professor?’). This aligns with Vygotskian sociocultural theory, where mediated reflection transforms external virtual activity into internalized linguistic competence.

Instruments

1. *Communicative Competence Test (CCT)*: Researcher-developed, based on Canale and Swain’s (1980) framework (grammatical, sociolinguistic, discourse, strategic), validated by experts (Cronbach’s $\alpha = 0.87$).
2. *Foreign Language Classroom Anxiety Scale (FLCAS)*: Horwitz et al. (1986) to measure anxiety reduction.
3. *Semi-Structured Interviews*: Conducted with 12 EG students to explore perceived transfer and affective responses.

Data analysis. Quantitative data were analyzed using SPSS (independent and paired samples t-tests, Cohen’s d^* for effect sizes). Qualitative interview data underwent thematic analysis (Braun and Clarke, 2006).

Results and Discussion

Communicative competence gains.

Table 1 presents the CCT scores. While both groups showed improvement, the EG demonstrated significantly greater gains, particularly in sociolinguistic and strategic competence.

Dimension	Group	Pre-test	Post-test	*t*-value	*p*-value	Cohen’s d^*
Sociolinguistic	EG	61.5 ± 9.2	78.8 ± 6.5	8.42	<.001	1.28
	CG	62.1 ± 8.9	68.4 ± 8.2	2.81	.008	0.51
Strategic	EG	59.8 ± 9.5	77.4 ± 6.8	9.15	<.001	1.42
	CG	60.2 ± 9.3	66.5 ± 8.7	2.45	.018	0.45

Table 1. *Communicative Competence Test Scores (Mean ± SD)*

Discussion: The large effect sizes for the EG indicate that VR’s spatial authenticity allows learners to practice pragmatic markers (e.g., hedging, politeness) and repair strategies in context, which traditional role-plays often fail to simulate realistically.

Affective Factors: Anxiety and WTC.

The EG showed a statistically significant reduction in FLCAS scores (Post-test $M = 52.3$) compared to the CG ($M = 68.9$), $t^*(58) = -5.64$, $p^* < .001$. Qualitative data revealed a “safe danger” paradox: students felt the

physiological presence of real communication, which raised their engagement, but the knowledge that “no real-world consequences exist” lowered their affective filter (Krashen, 1982), encouraging risk-taking.

Willingness to Communicate (WTC) and Presence. Addressing the second research question, the EG demonstrated a significant increase in WTC, measured by an adapted version of MacIntyre et al.'s (1998) WTC scale. The EG's mean WTC score rose from 45.2 (± 8.1) at pre-test to 68.5 (± 7.4) at post-test, yielding a large effect size (Cohen's $d = 1.35$, $p < .001$). In contrast, the CG showed only marginal improvement (Pre-test $M = 46.0$, Post-test $M = 51.2$, $p = .042$). Furthermore, Pearson correlation analysis revealed a strong negative correlation between immersive VR presence (measured by the Slater-Usuh-Steed presence questionnaire) and foreign language anxiety ($r = -.68$, $p < .01$), and a strong positive correlation with WTC ($r = .72$, $p < .01$). This suggests that the psychological sense of “being there” in a low-stakes virtual environment directly fuels the learner's readiness to initiate communication.

The transfer mechanism. Thematic analysis highlighted that the *Reflective Bridging* phase was the critical catalyst for transfer. Students noted: “At first, VR felt like a game. But when we had to analyze our mistakes and use the same phrases in a real video call, I realized it was genuine preparation” (Student 4). This confirms that immersive technology requires explicit pedagogical scaffolding to translate virtual experience into real-world competence (Dirkin et al., 2022).

Furthermore, thematic analysis uncovered two additional salient themes. First, Identity Exploration and Avatar Embodiment: several students reported that the visual dissociation provided by a virtual avatar significantly reduced self-consciousness. As Student 8 noted, “Speaking as an avatar gave me the courage to try complex sentences without worrying about my accent or physical appearance.” This supports the notion that VR

can temporarily suspend the learner's real-world linguistic identity, allowing for safer experimentation. Second, Initial Technological Friction: a minority of students reported mild cybersickness or interface confusion during the first two sessions. However, this dissipated by week three, highlighting the necessity of a dedicated “technological acclimatization” phase before core pedagogical activities commence.

Conclusion

This study empirically validates the Virtuo-Real Approach as an effective post-digital methodology for EFL contexts. By integrating VR immersive practice with structured reflective transfer, the framework significantly enhances communicative competence (especially sociolinguistic and strategic dimensions) while reducing foreign language anxiety.

Scientific Novelty: The study is the first to operationalize the “Virtuo-Real” framework in the Central Asian EFL context, proving that VR is not merely a content delivery tool, but a “third space” for embodied language acquisition when coupled with metacognitive reflection.

Practical Significance: The findings provide EFL educators and curriculum designers with a validated, step-by-step alternative to traditional testing. It is recommended that language programs incorporate short, targeted VR modules followed by mandatory reflective journaling to maximize skill transfer.

Limitations: The study was limited to a 12-week period with intermediate university learners. Future research should explore long-term retention and the framework's applicability to younger learners or English for Specific Purposes (ESP) contexts.

While the findings are promising, this study was limited to a 12-week period with intermediate-level university learners at a single institution, which may affect the generalizability of the results to other demographics. Additionally, the reliance on

specific hardware (Meta Quest) means that findings may vary with different levels of immersive fidelity or standalone mobile VR. Future research should explore: (1) longitudinal studies to assess the long-term retention of communicative competence beyond the immediate post-test; (2) the framework's

applicability to younger learners (e.g., secondary school) or English for Specific Purposes (ESP) contexts, such as medical or aviation English; and (3) the comparative efficacy of fully immersive VR versus desktop-based 3D simulations in facilitating the "reflective bridging" process.

References:

1. Bhabha, H. K. (1994). *The location of culture*. Routledge.
2. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101.
3. Canale, M., & Swain, M. (1980). Theoretical bases of communicative approaches to second language teaching and testing. *Applied Linguistics, 1*(1), 1–47.
4. Dirkin, K. (2022). Bridging the gap: Transfer of learning from virtual to real-world contexts. *Computers and Education, 178*, 104–119.
5. Horwitz, E. K., Horwitz, M. B., & Cope, J. (1986). Foreign language classroom anxiety. *The Modern Language Journal, 70*(2), 125–132.
6. Huang, H. M., Rauch, U., & Liaw, S. S. (2010). Investigating learners' attitudes toward virtual reality learning environments: Based on a constructivist approach. *Computers & Education, 55*(3), 1171–1182.
7. Jandrić, P. (2022). The postdigital challenge. *Postdigital Science and Education, 4*(1), 1–12.
8. Krashen, S. D. (1982). *Principles and practice in second language acquisition*. Pergamon.
9. Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to Western thought*. Basic Books.
10. Lin, T. J., & Lan, Y. J. (2023). Virtual reality in language learning: A meta-analysis. *Language Learning and Technology, 27*(2), 78–95.
11. MacIntyre, P. D., Clément, R., Dörnyei, Z., & Noels, K. A. (1998). Conceptualizing willingness to communicate in a L2: A situational model of L2 confidence and affiliation. *The Modern Language Journal, 82*(4), 545–562.
12. Slater, M., Usoh, M., & Steed, A. (1994). Depth of presence in virtual environments. *Presence: Teleoperators & Virtual Environments, 3*(2), 130–144.
13. Slater, M., & Sanchez-Vives, M. V. (2016). Immersive virtual reality as a pedagogical tool. *Presence, 25*(2), 99–115.