EXPLORING VR AND AR IN ENGLISH LEARNING: INSIGHTS FROM TAY NGUYEN UNIVERSITY

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Received: 26/11/2025
Revised: 08/12/2025
Accepted: 24/12/2025
DOI: 10.71192/183765alfslq

Abstract

This study explores English-major students' perceptions of Virtual Reality (VR) and Augmented Reality (AR) applications in English at Tay Nguyen University, Vietnam. Employing a quantitative descriptive design, data were collected from 120 undergraduate students using a five-point Likert-scale to assess their perceptions of usefulness, engagement, and challenges associated with VR and AR. The results revealed that students generally hold positive attitudes toward the integration of VR and AR technologies in their English learning process. The students perceived these technologies as effective tools for enhancing communication, vocabulary, and motivation through authentic and interactive contexts. However, moderate challenges were reported regarding limited device accessibility, unstable internet connectivity, and insufficient technical support. No significant differences in perception were found among academic years. The findings align with existing literature that emphasizes the role of immersive technologies in enhancing student engagement and motivation in language learning. Practical implications for pedagogical innovation in the Central Highlands context are also discussed.

Keywords: *Virtual Reality (VR), Augmented Reality (AR), English language learning, student perception, Tay Nguyen University, immersive learning.*

Nhận thức của sinh viên về ứng dụng Thực tế Ảo (VR) và Thực tế Tăng cường (AR) trong học tập tiếng Anh: Nghiên cứu tại Trường Đại học Tây Nguyên

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Tóm tắt

Nghiên cứu này khảo sát nhận thức của sinh viên ngành Ngôn ngữ Anh về việc ứng dụng Thực tế Ảo (Virtual Reality - VR) và Thực tế Tăng cường (Augmented Reality - AR) trong quá trình học tiếng Anh tại Trường Đại học Tây Nguyên. Phương pháp nghiên cứu định lượng mô tả được sử dụng với dữ liệu thu thập từ 120 sinh viên thông qua bảng hỏi Likert năm mức đo lường ba khía cạnh: tính hữu ích, mức độ hứng thú và những thách thức khi sử dụng công nghệ. Kết quả cho thấy sinh viên có thái độ nhìn chung tích cực đối với tích hợp VR và AR vào học tập tiếng Anh. Người học đánh giá VR/AR góp phần tăng cường khả năng giao tiếp, mở rộng vốn từ vựng và tạo động lực học tập nhờ các trải nghiệm tương tác có tính chân thực cao. Tuy nhiên, những khó khăn liên quan đến hạn chế thiết bị, kết nối Internet và hỗ trợ kỹ thuật vẫn được ghi nhận ở mức độ trung bình. Phân tích so sánh giữa các khóa học không cho thấy sự khác biệt đáng kể về nhận thức giữa các nhóm sinh viên. Các phát hiện cho thấy công nghệ thực tế ảo và thực tế tăng cường có tiềm năng thúc đẩy đổi mới phương pháp giảng dạy tiếng Anh trong giáo dục đại học, đặc biệt tại khu vực Tây Nguyên, song việc triển khai cần được hỗ trợ bởi cơ sở hạ tầng phù hợp, đào tạo kỹ năng công nghệ cho giảng viên và lộ trình ứng dụng mang tính từng bước.

Từ khóa*: Thực tế ảo (VR), Thực tế tăng cường (AR), học tập tiếng Anh, nhận thức của sinh viên, Trường Đại học Tây Nguyên, học tập nhập vai.*

1. Introduction

In recent years, the integration of emerging technologies such as Virtual Reality (VR) and Augmented Reality (AR) has brought transformative potential to language education worldwide. These immersive technologies allow learners to experience authentic communicative

environments that simulate real-world interaction, thereby enhancing engagement, motivation, and language proficiency (Yang et al., 2020; Lou, 2025). VR offers computer-generated, three-dimensional environments where learners can interact using avatars (Chau et al., 2013), while AR overlays digital information onto real-world settings, bridging the gap between virtual and physical learning spaces (Childs et al., 2023). In English as a Foreign Language (EFL) contexts, both tools promote experiential learning and contextualized practice, enabling learners to acquire linguistic and cultural knowledge through meaningful immersion (Esfandiari & Mazharpour, 2025).

Internationally, numerous studies have examined how VR and AR enhance vocabulary learning, speaking fluency, and listening comprehension among EFL learners (Tai & Chen, 2021; Tsai, 2020; Mohd Nabil et al., 2024). These studies suggest that VR/AR-based environments improve motivation, retention, and learner autonomy by providing situated, low-anxiety contexts for communication. However, challenges such as technical accessibility, cognitive overload, and insufficient teacher training continue to limit their full pedagogical potential (Perifanou et al., 2022). Despite the growing body of literature on immersive technologies in second language acquisition, few studies have examined learners' perceptions of VR and AR in Vietnamese tertiary education, particularly in remote, multicultural regions such as the Central Highlands.

At Tay Nguyen University in Dak Lak province, the adoption of educational technologies is emerging as part of broader efforts to modernize English language teaching and align with the national project on foreign language education (Decision No. 1400/QD-TTg, 2008). However, the implementation of immersive technologies remains in its early stages, and empirical evidence on students' attitudes, readiness, and perceived benefits is scarce. Understanding these perceptions is crucial, as learners' acceptance and motivation are key determinants of successful technology integration (Huang & Liaw, 2018).

Given this gap, the present study aims to explore English-major students' perceptions of VR and AR applications in English learning at Tay Nguyen University. Specifically, it seeks to examine their levels of engagement, perceived usefulness, and challenges when interacting with immersive learning tools. By shedding light on students' views, this study provides insights into how VR and AR can be effectively integrated into EFL instruction in Vietnam's higher education context, thereby contributing to the ongoing digital transformation of language learning in the Central Highlands.

2. Literature Review

2.1. Virtual Reality (VR) and Augmented Reality (AR) in Language Education

Virtual Reality (VR) and Augmented Reality (AR) have emerged as transformative tools in foreign language instruction, offering immersive, interactive environments that transcend traditional classroom boundaries. VR typically creates computer-generated, three-dimensional spaces in which learners can navigate and communicate through avatars (Chau et al., 2013). In contrast, AR superimposes digital elements onto real-world contexts, enriching physical spaces with linguistic input (Childs et al., 2023). In language learning, these technologies afford opportunities for contextualized exposure to the target language, enabling learners to engage with authentic linguistic and cultural scenarios (Lee & Park, 2020).

Extensive research has demonstrated that VR and AR enhance learners' motivation, autonomy, and communicative competence (Yang et al., 2020; Lou, 2025). By simulating real-life settings, i.e.markets, airports, or classroom learners can practice speaking and listening in contextually meaningful ways that foster both fluency and accuracy (Yan et al., 2024). Moreover, the embodied experiences provided by VR and AR have been found to improve vocabulary retention and pronunciation through multisensory engagement (Tai & Chen, 2021). These immersive tools, therefore, align closely with constructivist learning principles, emphasizing experiential learning and learner-centered participation (Matriano, 2020).

2.2. Learner Perceptions and Technology Acceptance in EFL Contexts

Learner perception plays a critical role in the success of technology-enhanced language learning. According to the Technology Acceptance Model (Davis, 1989), two key determinants, perceived usefulness and perceived ease of use, influence learners' willingness to adopt new technologies. In EFL settings, students

who view digital tools as beneficial and user-friendly are more likely to engage meaningfully and sustain motivation (Navas, 2025). Studies across Asia have shown that VR and AR applications are generally well-received by learners, who report higher engagement and satisfaction due to interactive features and gamified learning experiences (Ukenova & Bekmanova, 2023; Zourmpakis et al., 2023).

However, several studies have also noted practical and affective barriers. Technical difficulties, limited access to compatible devices, and lack of digital literacy may hinder students' confidence and reduce their willingness to engage (Perifanou et al., 2022; Statti & Torres, 2020). Furthermore, while immersive technologies may increase enjoyment, they can also impose cognitive load if not properly scaffolded (Poupard et al., 2025). Therefore, investigating students' perceptions within specific contexts-such as Vietnamese universities - provides valuable insights into localized factors affecting adoption and sustained use.

2.3. The Vietnamese EFL Context and the Need for Immersive Pedagogies

In Vietnam, English education has undergone significant reforms aimed at improving communicative competence and integrating digital technologies. The National Foreign Language Project (Decision No. 1400/QĐ-TTg, 2008) emphasizes the modernization of teaching methods and the incorporation of educational technologies at all levels. While universities in major cities have increasingly adopted blended and online learning, institutions in remote areas like the Central Highlands face infrastructural and training challenges that limit access to innovative tools (Brenya, 2024).

At Tay Nguyen University, English-major students often rely on conventional classroom instruction, with limited exposure to experiential learning or virtual simulation. Given the multicultural environment and regional linguistic diversity, immersive technologies such as VR and AR hold great potential to bridge gaps in authentic language exposure. However, empirical evidence on how students perceive and adapt to such technologies remains minimal. Understanding these perceptions can inform more effective pedagogical designs tailored to the needs and constraints of the local context.

2.4. Research Gap

Previous international studies have affirmed the pedagogical value of VR and AR in enhancing language learning motivation and interaction (Yang et al., 2020; Lou, 2025). However, few have explored how EFL learners in developing regions, particularly in Vietnam, perceive and engage with these tools. Most existing Vietnamese studies have focused on general digital learning platforms (e.g., Nguyen-Anh et al., 2023; Thi et al., 2023) rather than immersive technologies. Consequently, there is a lack of empirical research that connects students' attitudes, engagement levels, and perceived challenges regarding VR/AR use in EFL learning.

Addressing this gap, the present study investigates the perceptions of English-major students at Tay Nguyen University toward VR and AR applications in language learning. It aims to provide context-specific insights that may guide future implementation strategies in higher education settings across Vietnam.

3. Methodology

3.1. Research Design

This study employed a quantitative descriptive design using a questionnaire-based survey to investigate English-major students' perceptions of Virtual Reality (VR) and Augmented Reality (AR) applications in English learning. The design was chosen to collect measurable data on learners' engagement, attitudes, and perceived usefulness of immersive learning technologies. A cross-sectional approach was used to capture participants' responses at a single point in time, reflecting their current experiences and readiness for technology integration. The quantitative data were analyzed through descriptive and inferential statistics to reveal general trends and relationships among variables.

3.2. Context and Participants

The study was conducted at Tay Nguyen University, a public institution located in Dak Lak province in Vietnam's Central Highlands. The university offers English Language programs aimed at developing communicative competence, intercultural awareness, and pedagogical skills among students. Although English majors at the university are introduced to technology-assisted learning tools, exposure to immersive technologies such as VR and AR remains limited due to infrastructural and training constraints.

A total of 120 English-major undergraduates participated in the study. They were enrolled in different academic years (first to fourth year) and ranged in age from 18 to 23 years old. Among them, 82% were female and 18% were male, which reflects the typical gender distribution in English language programs across Vietnam. Participation voluntarily took part in the study after providing informed consent. The participants' average English proficiency level ranged from B1 to B2 according to the Common European Framework of Reference for Languages (CEFR).

3.3. Research Instrument

Data were collected through a structured questionnaire adapted from previous studies on technology acceptance and language learning motivation (Davis, 1989; Venkatesh & Bala, 2008; Parmaxi, 2020). The instrument consisted of two main sections:

Section 1: Demographic Information: This section gathered data on participants' academic year, gender, English proficiency level, preferred learning device, and daily screen time devoted to English learning activities.

Section 2: This section comprised 20 items assessed on a five-point Likert scale, with responses ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The items were crafted to evaluated three core constructs related to students' experiences with immersive technologies:

(1) Perceived Usefulness: Items in this category examined the extent to which students believed VR and AR enhanced their English learning, particularly by offering opportunities to practice language skills in authentic, context-rich environments (e.g., "VR/AR helps me practice English in real-life contexts").

(2) Engagement and Motivation: These items evaluated learners' affective responses to VR/AR-based activities, focusing on whether the technologies fostered enjoyment, sustained attention, and increased willingness to participate in English lessons (e.g., "Learning with VR/AR makes English lessons more enjoyable").

(3) Perceived Challenges: Items under this construct explored potential obstacles encountered during VR/AR use, including technological difficulties, cognitive load, and the need for technical support (e.g., "I find VR/AR activities difficult to use without technical support").

The questionnaire was reviewed by two senior lecturers in Applied Linguistics for content validity and language clarity. A pilot test was conducted with 15 English-major students who were not part of the main study. Minor revisions were made to improve wording and ensure comprehensibility. The internal consistency of the final questionnaire was confirmed with a Cronbach's alpha coefficient of 0.89, indicating high reliability.

3.4. Data Collection Procedure

After obtaining institutional approval, the questionnaire was distributed online via Google Forms and shared through the faculty's forum. Participants were briefed on the study's purpose and assured of confidentiality and anonymity. The average completion time was approximately 10 minutes.

Before responding, participants were provided with a short orientation session introducing the concept of VR and AR, including examples of existing language-learning applications such as *Mondly VR*, *Google Expeditions*, and *AR Flashcards*. This ensured that all respondents had a basic understanding of immersive technologies, even if they had not used them extensively. Data collection was completed over two weeks, and all responses were automatically recorded for analysis.

3.5. Data Analysis

Quantitative data were analyzed using SPSS version 26.0. Descriptive statistics, including Mean (M) and Standard Deviation (SD), were calculated to summarize participants' perceptions across the three constructs. To explore potential differences across academic years or proficiency levels, Independent t-tests were performed where applicable. Correlation analyses were also conducted to examine the relationships between perceived usefulness, motivation, and challenges.

All statistical analyses followed a significance level of $p < .05$. The findings were interpreted considering previous literature on learner perception and technology acceptance, highlighting implications for EFL instruction in the Vietnamese higher education context.

4. Results and Discussion

This section presents the findings of the questionnaire survey, addressing the research objectives related to English-

major students' perceptions of Virtual Reality (VR) and Augmented Reality (AR) applications in English learning at Tay Nguyen University. Descriptive and inferential statistics are used to summarize participants' responses, followed by a discussion of the results in relation to previous studies.

4.1. Overall Perceptions of VR and AR in English Learning

Table 1 shows the overall descriptive statistics for the three constructs: *Perceived Usefulness*, *Engagement and Motivation*, and *Perceived Challenges*.

Table 1. Descriptive Statistics for Students' Perceptions of VR and AR Applications (N = 120)

Construct	Mean (M)	Standard Deviation (SD)	Interpretation
Perceived Usefulness	4.12	0.63	High
Engagement and Motivation	4.05	0.68	High
Perceived Challenges	3.22	0.84	Moderate
Overall Perception	**3.80**	**0.71**	**Positive**

Source: Results derived from the authors' data processing

As shown in Table 1, students expressed an overall positive perception of VR and AR integration in English learning (M = 3.80, SD = 0.71). They particularly valued the *usefulness* of VR and AR for practicing English in realistic settings (M = 4.12), which aligns with previous studies reporting that immersive tools enhance contextualized communication and task engagement (Parmaxi, 2020; Hwang et al., 2022). The dimension of *Engagement and Motivation* also scored highly (M = 4.05), suggesting that students found VR/AR-enhanced activities more enjoyable and interactive than traditional lessons.

However, the *Perceived Challenges* construct (M = 3.22) revealed moderate concerns regarding access to devices, internet connectivity, and limited technical guidance. These findings echo Compton's (2021) assertion that technological barriers and lack of teacher training can hinder sustained adoption of immersive learning tools in developing educational contexts.

4.2. Perceived Usefulness

Students reported that VR and AR allowed them to practice English in authentic communicative contexts, i.e. simulated conversations, virtual field trips, and task-based scenarios. The highest-rated items included "VR/AR helps me learn vocabulary in realistic situations" (M = 4.28, SD = 0.60) and "I can improve my pronunciation and listening through VR/AR activities" (M = 4.15, SD = 0.72).

Table 2. Descriptive Statistics for Perceived Usefulness Items (N = 120)

Statement	Mean (M)	SD
VR/AR helps me learn vocabulary in realistic situations	4.28	0.60
I can improve my pronunciation and listening skills through VR/AR	4.15	0.72
VR/AR provides opportunities for authentic communication	4.10	0.66
VR/AR supports my overall English language development	4.07	0.69
VR/AR helps me practice using English in real-life contexts	4.00	0.58
Overall Mean	**4.12 (High)**	

Source: Results derived from the authors' data processing

The descriptive results show that the students strongly agreed that VR/AR contributes to enhancing English skills in authentic communicative contexts. The highest perceived usefulness is related to vocabulary learning in real-life situations, followed by pronunciation and listening development.

These findings are consistent with research by Lin and Lan (2023), who found that immersive learning environments facilitate deeper linguistic processing and retention by integrating multisensory inputs. In the Vietnamese EFL context, this suggests that VR and AR could help overcome limited exposure to native-like environments by offering interactive simulations that replicate authentic communication.

4.3. Engagement and Motivation

As displayed in Table 3, most students agreed that VR and AR made learning English more engaging and enjoyable.

Table 3. Descriptive Statistics for Engagement and Motivation Items

Statement	Mean (M)	SD
VR/AR makes English learning more enjoyable.	4.22	0.67
I feel more confident speaking English in VR/AR environments.	4.01	0.79
I am motivated to use VR/AR in future English lessons.	3.92	0.70
I can stay focused longer during VR/AR activities.	4.05	0.65

Source: Results derived from the authors' data processing

The results highlight that learners perceived VR/AR-enhanced tasks as stimulating and effective in sustaining attention. This aligns with the findings of Tai & Chen (2021), who observed increased learner engagement due to the novelty and interactivity of immersive technologies. Moreover, the high motivation scores suggest that students are receptive to integrating these tools into formal instruction if provided with adequate support.

4.4. Perceived Challenges

Despite the positive attitudes, several challenges were identified. Students expressed concerns about limited access to devices (M = 3.46, SD = 0.91), unstable internet connections (M = 3.38, SD = 0.86), and a lack of technical support during lessons (M = 3.25, SD = 0.94). Additionally, a small proportion of students reported experiencing motion sickness or visual discomfort when using VR headsets (M = 2.81, SD = 0.98).

Table 4. Descriptive Statistics for Perceived Challenges Items (n = 120)

Statement	Mean (M)	SD
Limited access to VR/AR devices	3.46	0.91
Unstable internet connection during VR/AR activities	3.38	0.86
Lack of technical support during class	3.25	0.94
VR/AR activities are sometimes difficult to navigate	3.15	0.88
I experience discomfort (motion sickness, eye strain) when using VR	2.81	0.98
Overall Mean	**3.22 (Moderate)**	

Source: Results derived from the authors' data processing

Students reported moderate constraints, especially those related to access, connectivity, and technical support. The lowest difficulty concerns physical discomfort, although a small proportion still experienced motion sickness.

These constraints reflect infrastructural limitations commonly found in regional universities (Addie, 2021). Similar barriers have been noted by Nisiforou & Kosmas (2024), who emphasized that successful integration of immersive tools depends heavily on institutional readiness, including access to reliable technology and teacher training.

4.5. Comparison by Academic Year

A one-way ANOVA was conducted to determine whether perceptions differed by academic year. The results showed no statistically significant difference in overall perception among first-year, second-year, third-year, and fourth-year students ($F(3,116) = 1.87$, $p = .14$). This finding implies a rather uniform readiness and acceptance across first- to fourth-year students regardless of their differing levels of exposure to technology-enhanced instruction. In terms of the Technology Acceptance Model (Davis et al., 1989), this homogeneity may indicate that perceived usefulness and perceived ease of use function as relatively stable determinants across academic progression, especially when students share similar curricular structures and institutional learning environments.

Despite the absence of significant statistical differences, qualitative inspection of the mean values revealed that senior students tended to report

slightly higher awareness of technical constraints, specifically related to device availability and network stability. This trend may reflect accumulated classroom experience and a more realistic assessment of infrastructural limitations. From an educational implementation perspective, this highlights the importance of addressing logistical and institutional readiness when introducing immersive technologies, especially in resource-constrained contexts where access and connectivity remain heterogeneous.

In the context of the Central Highlands, the comparable levels of perception across academic years also suggest that these tools can be introduced at any stage of an English-major program without requiring a prerequisite level of technological familiarity. This is particularly relevant for Vietnamese tertiary institutions undergoing digital transformation because it indicates that early exposure is not a prerequisite for students' willingness to adopt VR/AR. Nevertheless, the slightly greater concern among senior cohorts underlines the need for continuous infrastructural development and incremental training, so that positive perceptions can be sustained throughout students' academic progression.

4.6. Discussion

The findings of this study indicate that English-major students at Tay Nguyen University generally expressed positive perceptions of VR and AR applications in English learning. High scores for perceived usefulness and engagement suggest that immersive environments are viewed as relevant to authentic language practice, especially for vocabulary development, pronunciation, and interaction in simulated communicative contexts. These patterns mirror international evidence that immersive tools provide situated and experiential learning opportunities that support communicative competence. In line with the Technology Acceptance Model, the students' intentions to adopt VR/AR appear primarily driven by perceived usefulness, while perceived ease of use is somewhat constrained by infrastructural limitations.

In contrast, perceived challenges, particularly those associated with device accessibility, internet stability, and technical support, demonstrate that technology acceptance in developing contexts depends not only on learner attitudes but also on institutional readiness. These issues are consistent with the limitations reported in prior studies, highlighting that infrastructure and professional support remain essential for sustainable adoption. While the challenges were rated at a moderate level, their presence suggests that future implementation requires a gradual and context-sensitive approach to avoid overburdening learners and instructors.

Regarding academic year comparison, the absence of significant differences suggests that immersive technologies are regarded similarly across cohorts, even though senior students showed slightly higher awareness of technical constraints. This indicates that readiness to adopt VR/AR does not necessarily depend on academic progression, and immersive tools could therefore be introduced at any stage of the curriculum. At the same time, the trend among upper-year students underscores the importance of recognizing that extended classroom experience may lead to more critical perceptions of infrastructural constraints, especially in regional universities where resource availability remains uneven.

From a pedagogical perspective, the findings emphasize several implications for EFL instruction. First, immersive platforms should be embedded into task-based language learning to maximize the benefits of contextualized communication. Authentic tasks in virtual environments, such as real-life simulations and collaborative problem-solving, may leverage students' motivation and sustain engagement. Second, successful integration depends substantially on teachers' technological competence and pedagogical design skills. Professional development and institutional support should enable educators to operate VR/AR tools confidently and incorporate them into meaningful communicative activities. Third, infrastructural preparations, including stable network access and shared devices, are prerequisites for equitable participation. In contexts where resources are limited, lightweight AR applications or mobile-based tools may serve as transitional options before moving to fully immersive VR experiences.

Finally, the regional characteristics of the Central Highlands suggest that immersive technologies hold relevance for enhancing exposure to authentic communicative environments, which local students often lack. However, such

potential can only be realized when the introduction of VR/AR is aligned with institutional capacity and gradual implementation. These insights provide an empirical basis for informed decision-making regarding future deployment of immersive tools in higher education and establish a necessary bridge to the concluding section addressing research implications, limitations, and directions for further investigation.

5. Conclusion and Pedagogical Implications

5.1. Summary of Key Findings

This study investigated English-major students' perceptions of Virtual Reality (VR) and Augmented Reality (AR) applications in English language learning at Tay Nguyen University. The results indicated generally positive attitudes toward immersive environments, with high levels of perceived usefulness and motivation. The students reported that VR/AR technologies enabled authentic communicative practice, enriched vocabulary learning, and facilitated pronunciation and listening development in simulated real-world contexts. Despite these advantages, several challenges emerged, particularly regarding device accessibility, internet stability, and technical support, which reflect infrastructural limitations commonly found in regional higher education settings. The comparison among academic cohorts showed no significant difference in overall perceptions, suggesting that readiness to engage with immersive tools remains relatively stable across academic progression.

5.2. Research Limitations and Suggestions for Future Research

Several limitations should be acknowledged when interpreting these findings. First, the study relied primarily on self-report questionnaire data, which may not fully capture learners' actual performance or behavioral engagement in VR/AR environments. Additional qualitative methods, such as classroom observations or interviews, could provide richer insights into how students interact with immersive technologies. Second, the sample was limited to a single university in the Central Highlands, which may restrict the generalizability of the results to other institutional contexts. Comparative studies across multiple universities or regions would extend understanding of contextual variations in technology adoption. Third, the implementation of immersive tools in the present context remains preliminary; future studies could examine long-term effects on communicative competence, learning outcomes, and learner autonomy when VR/AR activities are more systematically integrated into the curriculum.

Future research should also explore instructional design principles that optimize the pedagogical value of immersive environments, particularly in resource-constrained contexts. Investigating scalable models for teacher professional development and institutional capacity building would further support sustainable integration. Taken together, these directions may contribute to a deeper understanding of how immersive technologies can enhance English language learning and inform evidence-based decision-making for digital transformation in Vietnamese higher education./.

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