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Student Practices and Perceptions of Autonomous English Learning with Virtual Reality: An ImmerseMe Case Study

Lady Viviana Hernández Pérez,[1] Juan Habib Bendeck Soto, [2]* Cristian Zapata Arboleda, [3] Carlos Mauricio Vélez Camacho[4]

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ABSTRACT
Virtual reality (VR) offers opportunities for authentic language practice, but evidence about autonomous engagement remains limited. This single-phase mixed-methods case study examined 34 undergraduate EFL students at a private university in Colombia using ImmerseMe. After simulated communicative activities, students completed ten five-point Likert items and an open-ended question. Descriptive statistics showed favorable perceived independent practice (M = 4.82), control over learning (M = 4.68), reflection (M = 4.38), and usability (M = 4.41), while immersion varied more (M = 4.06, SD = 0.95). Thirty-four open-ended responses were classified into five primary themes; general positive feedback (n = 18) and learning/practice value (n = 12) predominated. Individual comments described enjoyment, reduced anxiety, and scenario-quality concerns. Findings concern self-reported perceptions, not demonstrated proficiency gains or sustained autonomy. VR may complement EFL teaching when coupled with purposeful goals, guided reflection, and institutional support.

[1] Corporación Universitaria Remington, Colombia. Email: lady.hernandez@uniremington.edu.co
[2] Corporación Universitaria Remington, Colombia. Email: juan.bendeck@uniremington.edu.co
https://orcid.org/0000-0002-9180-4623 *Corresponding author
[3] Corporación Universitaria Remington, Colombia. Email: cristian.zapata@uniremington.edu.co
[4] Corporación Universitaria Remington, Colombia. Email: carlos.velez@uniremington.edu.co

INTRODUCTION

Learner autonomy, defined by Holec (1981) as taking responsibility for one's learning, remains central to English language education. Little (1991) foregrounds reflection and self-evaluation, while Benson and Voller (1997) emphasize the social conditions within which autonomy develops. Stringer (2024) similarly presents autonomy as emergent and context-sensitive. These perspectives raise a practical question: how can emerging technologies support learners' agency without assuming that technology alone produces independent learning? The emphasis on autonomy also distinguishes responsibility from isolation: learners can exercise choice within intentionally designed tasks, receive feedback, and reconsider goals. This is important in university EFL programs because the opportunities to practice outside class are distributed unevenly and are shaped by learner confidence as well as access.

Virtual reality (VR) offers contextualized language practice and engagement (Parmaxi, 2023; Chen et al., 2022; Hua & Wang, 2023). Research on interactivity and vocabulary learning (Kaplan-Rakowski & Thrasher, 2025) and on enjoyment and cognitive demands (An & Kaplan-Rakowski, 2024) highlights both its potential and limitations. High immersion does not automatically yield autonomous learning; learners must interpret and use these opportunities purposefully (Dhimolea et al., 2022).

ImmerseMe provides simulated everyday and professional English interactions, allowing repeated communicative practice. Research on the platform and related VR pedagogy suggests possible benefits for communicative confidence and intercultural engagement (Facer & Uebiyev, 2024; Akay & Kessler, 2024). However, usability, accessibility, and sustainable participation require consideration. The central question is not whether immersion is attractive, but how learners use its affordances for independent practice and reflection.

Two perspectives clarify this question. Reinders (2020) argues that structured digital opportunities can extend autonomous learning beyond classrooms, whereas Maru et al. (2021) document how connectivity, digital literacy, and motivation may constrain autonomy. These views need not be contradictory: resources create opportunities, but students' capacity to use them depends on learner readiness and context. Examining ImmerseMe can illuminate how perceived self-direction, reflection, and immersion coexist. ImmerseMe is especially useful as an empirical context because its simulated exchanges make it possible for students to evaluate whether repeated practice feels manageable and meaningful. Measuring self-reported goal setting and reflection alongside immersion permits a more nuanced interpretation than treating exposure to VR as a single indicator of learner-centered success.

This single-phase mixed-methods case study investigates 34 undergraduate EFL students at a private university in Colombia after using ImmerseMe. It examines perceived self-direction, goal setting, reflection, immersion, usability, interactivity, and communicative confidence through Likert-scale responses and open-ended comments. Rather than asserting causal gains or VR superiority, it aims to inform how immersive learning may complement autonomy-oriented instruction.

LITERATURE REVIEW

Autonomous Language Learning

Holec (1981) frames autonomy as responsibility for learning choices, while Little (1991) stresses awareness, reflection, and self-evaluation. Together they establish autonomy as both decision-making and metacognitive activity, not simply independent access to materials. Autonomy is also socially situated. Benson and Voller (1997) describe independence alongside interdependence, and Littlewood (1996) distinguishes initiative-taking from reactive autonomy. Their shared implication is that teacher guidance and institutional structures can support, rather than negate, learner agency. Pavlenko (2021) links autonomy with identity and power, whereas Stringer (2024) emphasizes its emergent, contextual character. These perspectives foreground the learner's opportunities to exercise agency, not autonomy as a fixed trait.

Digital settings reveal this contingency. Reinders (2020) emphasizes opportunities beyond the classroom, whereas Maru et al. (2021) document technological and motivational barriers. Autonomy therefore depends on learners' strategies and circumstances as well as available tools.

Virtual Reality in Language Education

VR can situate language learning in contextualized, experiential communication (Parmaxi, 2023). Reviews report promising linguistic and motivational outcomes (Chen et al., 2022; Hua & Wang, 2023), although their educational significance depends on task design rather than novelty.

Interactivity is a recurring affordance. Akay and Kessler (2024) discuss oral and pragmatic opportunities, while Kaplan-Rakowski and Thrasher (2025) examine vocabulary learning through immersive interaction. Both stress participation, but neither implies that active VR use alone establishes autonomy.

Benefits coexist with cognitive demands. Dhimolea et al. (2022) caution about limitations of high immersion; An and Kaplan-Rakowski (2024) report enjoyment alongside challenges, and Cowie and Alizadeh (2025) emphasize pedagogically purposeful integration. Thus, enjoyment, presence, and autonomous strategy use should be distinguished.

Presence concerns the subjective sense of being in an environment (Slater & Wilbur, 1997), while affordances concern opportunities for learning and interaction (Dalgarno & Lee, 2010). Bailenson et al. (2008) discuss wider educational transformations, and Peterson (2011) calls for outcome-specific evidence. Together these perspectives justify examining immersion alongside, rather than as a proxy for, autonomy. For EFL pedagogy, this distinction matters because the psychological impression of presence may vary across learners even when the software and communicative task are similar. A learner who reports limited immersion may still see value in a concrete opportunity to rehearse English; the reverse is also possible. These possibilities should be investigated rather than assumed.

ImmerseMe Platform as a Case of VR-Based Language Learning

ImmerseMe offers simulated restaurant, travel, and workplace exchanges in which learners can rehearse language. These opportunities may support independent repetition and

communicative decision-making, but their value depends on students' goals, access, and reflective use.

Research on ImmerseMe and immersive language teaching highlights possible communicative and intercultural benefits (Facer & Uebiyev, 2024; Bendeck Soto et al., 2020). Studies of broader immersive environments report value in interactivity and learning design (Cai et al., 2025; Alfadil, 2024); these broader findings are not direct evidence of ImmerseMe's effectiveness.

Implementation also matters. He and Smith (2019) discuss the platform's practical demands, while broader scholarship urges caution about assuming that educational technology guarantees engagement. Accessibility, design quality, and learner readiness may shape participation.

Bendeck Soto et al. (2020) emphasize the contextual adaptation of ImmerseMe in higher education. Yan and Lowell (2025) place contemporary immersive platforms within the evolution of language technologies. The common gap is whether students perceive these communicative opportunities as supporting goal-directed, reflective, and independent practice. However, evidence about communicative practice cannot be transferred directly to claims about sustained autonomous behaviors. This study consequently focuses on what respondents report doing, intending, and noticing. Its single-site design offers contextual detail at the expense of generalizability, an acceptable trade-off when the claims are carefully bounded.

Integrative Framework: Student Practices and Perceptions

Autonomy involves goal setting, reflection, and self-evaluation (Holec, 1981; Little, 1991), whereas VR provides experiences of presence, contextual interaction, and usability (Slater & Wilbur, 1997; Dalgarno & Lee, 2010). These opportunities are not equivalent to autonomous behavior.

Studies of VR and self-directed learning (Tanashur et al., 2025) suggest opportunities for learner agency, while Maru et al. (2021) show that digital barriers may restrict it. The relationship is therefore contingent rather than automatic.

Chong and Reinders (2025) identify multiple dimensions of language learner autonomy, and Thanasoulas (2000) emphasizes metacognitive awareness. Accordingly, goal setting and reflection should be examined alongside immersion and usability, not inferred from them.

Evidence on VR benefits does not fully explain how perceived autonomy, reflection, and immersion coexist among undergraduate EFL learners using ImmerseMe within a specific institution. This contextual gap motivates the present investigation. More specifically, prior research tends to emphasize whether immersive activities are engaging or linguistically useful, whereas the present analysis examines how different facets of learner autonomy are perceived alongside the VR experience within one bounded university setting. The practical contribution is to identify which dimensions students rated highly, which varied, and which surfaced spontaneously in comments. This distinction is important because questionnaires can prompt affirmative ratings about features that participants do not independently mention in open-ended responses. Neither kind of evidence should be treated as a direct measure of proficiency or a longitudinal record of independent activity. Their combined interpretation

can nevertheless generate useful, carefully qualified proposals for instructional design and future studies.

The study therefore examines reported self-direction, goals, reflection, and willingness to practice independently alongside immersion, interactivity, usability, and confidence. Its interpretive framework views autonomy as dynamic and context-sensitive (Stringer, 202), without presuming causal or mediating relationships. The quantitative questionnaire provides comparable perceptions across ten aspects of the experience, whereas the open-ended comments indicate which aspects students spontaneously chose to mention. Interpreting these sources together may reveal convergences as well as limits in the evidence. This framework treats qualitative silence about a feature as absence of an explicit comment, not as evidence that the feature had no educational effect.

METHODOLOGY

This study adopted a single-phase mixed-methods case study to examine learners' perceptions of autonomous English practice with ImmerseMe. Integrating descriptive survey results with open-ended responses provided numerical patterns and contextual insight (Creswell & Plano Clark, 2018; Hernández-Sampieri & Mendoza, 2018).

Research Design

Quantitative Likert-scale responses and one open-ended response were collected in the same post-activity Microsoft Forms questionnaire. Quantitative patterns were interpreted alongside qualitative comments; no separate explanatory follow-up phase was conducted. The bounded case comprised undergraduate EFL use of ImmerseMe at one private Colombian university during the second semester of 2025 (Yin, 2018). Students were not analyzed as separate bounded cases. This design differs from an explanatory sequential approach: the qualitative response was not collected after quantitative results had been analyzed. It also differs from a collective case study because individual students were not treated as separate cases with individual case narratives. These distinctions align design terminology with what the data collection procedure actually supports. Both strands were integrated in the Findings and Discussion to contextualize reported autonomy, reflection, and VR experiences without making causal claims.

Participants

The analytical sample comprised 34 undergraduate EFL students from different academic faculties and proficiency levels at a private university in Colombia. The questionnaire recorded age, faculty, and English level. The small, single-institution sample supports contextual interpretation rather than statistical generalization.

Instrument

Students completed the Microsoft Forms questionnaire titled *Virtual Reality for Autonomous English Learning (Through ImmerseMe)*, containing ten Likert-scale items and one open-ended question. It was administered in Spanish; English item translations appear in the Methods, and shortened English item labels appear in Table 1.

The questionnaire comprised two principal dimensions:

1. **Autonomous Learning: Practices and Perceptions.** This dimension addressed students' perceived ability to engage independently with ImmerseMe, establish personal learning objectives, reflect on their experiences, and take greater responsibility for their English learning. Representative items included "I felt confident using ImmerseMe on my own without teacher help" and "I reflected on what I learned during or after the session." Additional items explored learners' perceptions of control over their learning and their willingness to continue using similar tools independently.
2. **Virtual Reality Environment and Preferences.** This dimension explored students' perceptions of immersion, interactivity, usability, communicative confidence, and preference for ImmerseMe compared with more traditional language learning tools. Representative items included "I felt immersed in realistic English-speaking situations while using ImmerseMe" and "The interactive features helped me engage more with the English language."

Responses to the quantitative items were recorded using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicated more favorable perceptions of the corresponding dimension. The questionnaire also included an open-ended question inviting participants to share observations or recommendations regarding their experiences with the platform.

Data Collection and Procedures

During the second semester of 2025, students explored ImmerseMe's simulated English-speaking scenarios in structured sessions that encouraged independent interaction. Following the activities, they completed the online questionnaire; both response types thus reflected the same learning experience.

Participation was described as voluntary and confidential, and informed consent was emphasized (Flick, 2018). No identifying information is reported in the presentation of participant excerpts, which are labeled using response numbers in the analytical dataset. The duplicate survey-export rows were excluded from the reported N = 34 analysis, as documented in the data-cleaning record; the remaining distinct records form the descriptive sample.

Data Analysis

Quantitative and qualitative responses were analyzed separately and integrated during interpretation. Quantitative analysis calculated means, sample standard deviations, minima, and maxima for ten items; figures present item means and immersion-rating frequencies. Qualitative analysis classified all 34 open-ended comments into one mutually exclusive primary category: general positive/unspecified feedback, perceived learning/practice value, enjoyment/speaking confidence, reduced anxiety, or scenario quality concerns. This descriptive categorization was informed by Braun and Clarke (2021); frequencies and authentic excerpts contextualized the survey ratings.

The two strands were compared in the discussion to distinguish general positive perceptions from specific reported experiences (Hernández-Sampieri & Mendoza, 2018).

FINDINGS AND DISCUSSION

The quantitative and qualitative findings provide complementary perspectives on undergraduate EFL students' experiences of autonomous English learning through the ImmerseMe platform. Overall, questionnaire responses revealed favorable perceptions of self-directed learning, reflection, usability, and communicative confidence, although students' experiences of immersion varied more considerably. Table 1 presents the descriptive statistics for the ten questionnaire items completed by 34 participants.

Table 1

Descriptive Statistics for Students' Perceptions of Autonomous English Learning and the ImmerseMe VR Environment (N = 34)

Item	M	SD	Min	Max
Independent confidence	4.03	0.87	2	5
Personal goal setting	4.21	0.73	3	5
Reflection	4.38	0.55	3	5
Control over learning	4.68	0.47	4	5
Future independent use	4.82	0.39	4	5
Immersion	4.06	0.95	1	5
Interactivity	4.35	0.65	2	5
Usability	4.41	0.70	2	5
Communicative confidence	4.32	0.68	3	5
Preference for ImmerseMe	4.29	0.68	3	5

Note. N = 34; M = mean; SD = sample standard deviation; Min = minimum; Max = maximum. Shortened English labels represent items administered in Spanish. Ratings ranged from 1 (strongly disagree) to 5 (strongly agree).

Independent future use (M = 4.82, SD = 0.39) and control over learning (M = 4.68, SD = 0.47) were highest. Reflection was favorable (M = 4.38, SD = 0.55); immersion showed the greatest variability (M = 4.06, SD = 0.95). These results describe perceptions, not measured learning gains.

Autonomy and Learner Agency

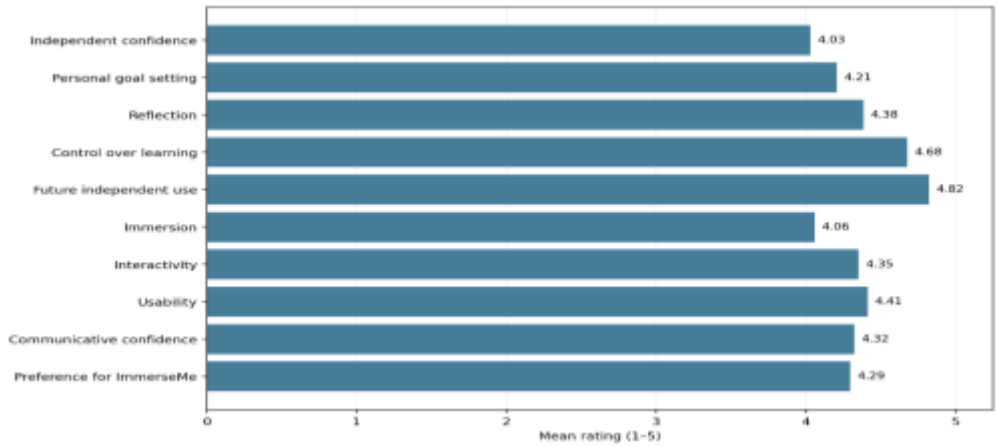


Figure 1. Mean Scores for Questionnaire Items on Autonomous Learning and VR Experiences (N = 34)

Figure 1 presents students' mean ratings across the ten questionnaire items. Willingness to continue using VR-based tools independently (M = 4.82) and perceived control

over learning (M = 4.68) obtained the highest mean scores. The findings reflect self-reported perceptions rather than independently observed autonomous learning behaviors. Students reported favorable autonomy-related perceptions, including future independent use (M = 4.82, SD = 0.39), perceived control (M = 4.68, SD = 0.47), goal setting (M = 4.21, SD = 0.73), and confidence using ImmerseMe alone (M = 4.03, SD = 0.87). Figure 1 presents all item means.

These findings resonate with Holec's (1981) responsibility-based view of autonomy and Little's (1991) emphasis on active reflection. However, intentions to practice independently do not demonstrate sustained autonomous behavior, and initial motivation need not predict long-term engagement (Dörnyei, 2001). The data therefore support perceived opportunities for agency, rather than evidence that ImmerseMe directly developed self-regulatory competence.

Reflection as a Metacognitive Practice

Reflection received a favorable rating (M = 4.38, SD = 0.55), suggesting relatively consistent reported reflection during or after VR practice.

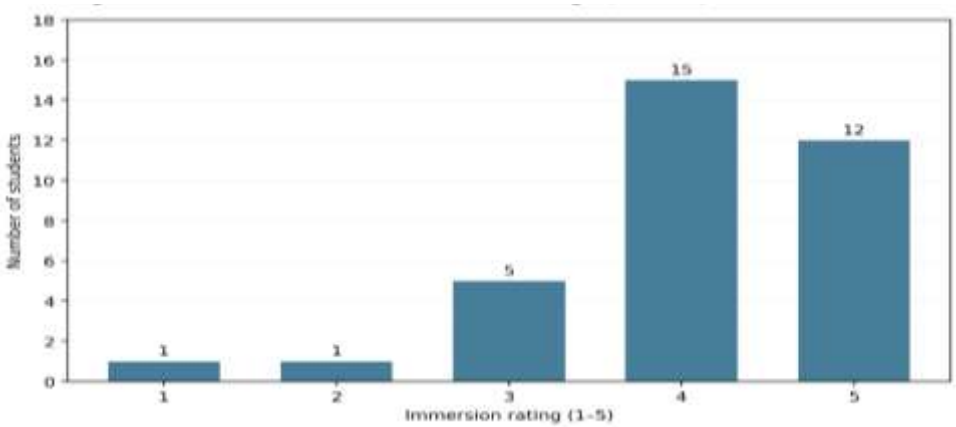
Reflection relates to metacognitive awareness and self-evaluation (Little, 1991; Thanasoulas, 2000). Virtual scenarios may offer opportunities to review communicative performance, although this process was not directly observed.

Reflection ratings were less dispersed than immersion ratings (M = 4.06, SD = 0.95). Their coexistence does not establish whether reflective students felt more or less immersed, nor whether reflection compensated for limited presence.

Pedagogically, pre-task goals and post-task reflection may help learners connect VR practice to broader learning objectives; these activities were recommendations, not tested interventions.

The Complexity of Immersion

Immersion had the greatest item variability (M = 4.06, SD = 0.95; range = 1–5). Figure 2 shows that 27/34 participants (79.4%) rated immersion 4–5, five (14.7%) rated it 3, and two (5.9%) rated it 1–2.



Note. Ratings were recorded on a five-point Likert scale. Most participants (79.4%) selected favorable ratings of 4 or 5, while 14.7% selected 3 and 5.9% selected 1 or 2.

Figure 2. Distribution of Students' Ratings of Immersion in Realistic English-Speaking Scenarios (N = 34)

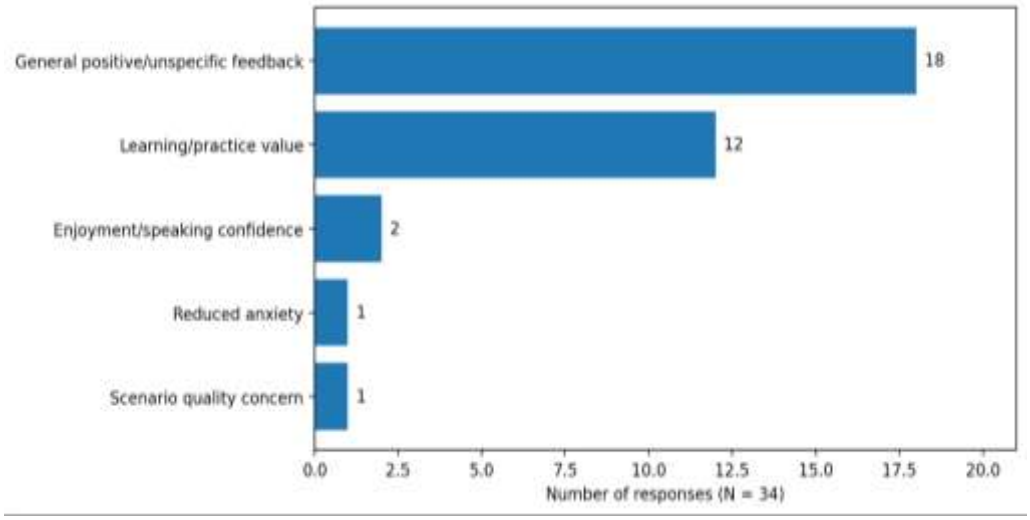
These findings are consistent with Slater and Wilbur's (1997) conceptualization of presence as a subjective component of immersive experiences. Although VR environments can provide the technological conditions for simulated participation, students do not necessarily experience those environments with the same degree of psychological involvement. Previous research has also emphasized that technological familiarity, cognitive demands, and contextual conditions may influence immersive learning experiences (Dhimolea et al., 2022; Maru et al., 2021).

The contrast between variable immersion and favorable perceptions of self-directed learning is particularly relevant to the study's theoretical framework. It suggests that students may recognize opportunities for independent language practice even when their subjective experiences of immersion differ. Thus, immersion and perceived autonomy should be considered distinct but potentially related aspects of VR-supported learning without assuming that stronger presence necessarily produces greater autonomous engagement.

Usability, Confidence, and Motivation

Usability (M = 4.41, SD = 0.70), interactivity (M = 4.35, SD = 0.65), real-life communicative confidence (M = 4.32, SD = 0.68), and preference over traditional tools (M = 4.29, SD = 0.68) were favorably rated. These perceptions align with the pedagogical relevance of interactivity (Cai et al., 2025), but confidence ratings are not independent proficiency measures.

The 34 open-ended responses were categorized as general positive/unspecified feedback (n = 18; 52.9%), learning/practice value (n = 12; 35.3%), enjoyment/speaking confidence (n = 2; 5.9%), reduced anxiety (n = 1; 2.9%), and scenario quality concern (n = 1; 2.9%). Figure 3 presents the mutually exclusive primary categories. General praise was common but often lacked detail about learning.



Note. Each of the 34 responses was classified into one primary descriptive category based on its most explicit content. General positive or unspecified feedback was the most frequent category (n = 18), followed by perceived learning and practice value (n = 12), enjoyment and speaking confidence (n = 2), reduced anxiety (n = 1), and scenario quality concerns (n = 1). Categories were mutually exclusive for descriptive frequency reporting.

Figure 3. Primary Categories Identified in Students' Open-Ended Responses (N = 34)

One participant described enjoyment and speaking apprehension: 'I feel that the platform is enjoyable and therefore helps not only with learning but also with gradually overcoming the embarrassment of speaking a language other than my native language' (Participant 16, translated from Spanish). This illustrates an individual experience, not a general effect.

Another student described learning value: 'It is very useful and can serve as a complementary tool for learning the language being studied (English III)' (Participant 25, translated from Spanish). This supports ImmerseMe's perceived supplementary role.

One participant stated, 'It helped me overcome my anxiety; I felt that I could learn English and that it was not just an obligation' (Participant 5, translated from Spanish). Anxiety reduction was explicit in only one primary-category response.

A critical voice noted, 'The scenarios are distorted; their quality could be improved' (Participant 22, translated from Spanish). This cautions against treating favorable overall usability ratings as evidence that every aspect of the platform was satisfactory.

Together, descriptive ratings and comments suggest favorable perceived usability and learning value, tempered by many nonspecific comments and individual concerns. They do not demonstrate language gains or sustained autonomy.

Synthesizing Across Findings

Across the findings, willingness to practice independently and perceived control were strongest; reflection and usability were favorable, and immersion more variable. The qualitative analysis primarily reflected general positivity and supplementary learning value, rather than widespread reports of motivation or anxiety reduction.

The contrast supports interpreting autonomous engagement as potentially related to learner agency and reflection rather than solely to subjective presence; no causal relationship was established. One particularly useful contrast emerges between highly favorable intentions for independent future use and the broader spread of immersion experiences. The former suggests participants found the platform worthwhile as an option for continued practice; the latter cautions against assuming that the experiential qualities of the environment were uniform. Both conclusions concern respondents' immediate perspectives rather than verified change over time.

Limitations and Future Research

Several limitations should be considered when interpreting these findings. First, the study relied on self-reported responses, which capture students' perceptions and reported practices rather than independently observed changes in autonomous behavior or English language proficiency. Consequently, favorable questionnaire ratings cannot establish the long-term effectiveness of ImmerseMe in developing learner autonomy.

Second, the research involved 34 undergraduate EFL students from a single private university in Colombia. Although this context provided relevant insight into learners' experiences with immersive technology, the findings should not be generalized to other institutional populations without further investigation.

Third, qualitative evidence was drawn from 34 open-ended questionnaire responses, many of which consisted of brief, general evaluations. In particular, 18 responses (52.9%)

were classified as general positive or unspecified feedback, limiting the depth of insight into participants' underlying motivations, learning strategies, and individual experiences. Furthermore, enjoyment and speaking confidence (n = 2), reduced anxiety (n = 1), and concerns regarding scenario quality (n = 1) were represented by relatively few responses. These categories therefore provide examples of individual experiences rather than evidence of patterns shared across the entire sample.

Future studies could adopt longitudinal mixed-methods designs to determine whether favorable perceptions of autonomous learning translate into sustained independent practices. Incorporating classroom observations, platform usage records, reflective journals, semi-structured interviews, and objective measures of language proficiency could provide stronger evidence concerning learners' actual behaviors and educational outcomes. Comparative investigations across institutions and learner populations could further clarify how contextual conditions shape immersion, learner agency, and the effectiveness of VR-supported English learning.

CONCLUSION

The findings of this mixed-methods case study suggest that the ImmerseMe virtual reality (VR) platform offers promising opportunities to support perceived learner autonomy among undergraduate EFL students. Participants reported favorable perceptions of their ability to take greater control over their English learning, establish personal learning objectives, reflect on their experiences, and continue practicing independently. These findings are consistent with Holec's (1981) conceptualization of autonomy as learners' capacity to take responsibility for their learning and Little's (1991) emphasis on reflection and self-regulation. They also complement research highlighting the potential of immersive environments to promote engagement and contextualized language practice (Parmaxi, 2020; Chen et al., 2022). Nevertheless, the results should be interpreted as evidence of students' reported perceptions and practices rather than demonstrated improvements in language proficiency or sustained autonomous learning behaviors.

An important contribution of the study concerns the distinction between perceived autonomy and the subjective experience of immersion. Although students reported favorable levels of reflection (M = 4.38, SD = 0.55) and willingness to engage independently with VR-based learning (M = 4.82, SD = 0.39), immersion ratings showed greater variability (M = 4.06, SD = 0.95). This contrast suggests that positive perceptions of self-directed learning can coexist with differences in students' experiences of virtual presence. From a theoretical perspective, these findings support a dynamic and context-sensitive understanding of learner autonomy (Stringer, 2024), in which technological affordances create opportunities for learning but do not independently determine how learners engage with those opportunities. Theories of presence (Slater & Wilbur, 1997) provide an additional perspective by recognizing that immersive experiences may differ among individuals. In this context, metacognitive practices such as goal setting, reflection, and self-evaluation may help learners connect VR-based experiences with their broader learning objectives. However, the findings do not establish whether reflection directly influenced immersion or compensated for less immersive experiences.

The qualitative analysis of 34 open-ended responses further contextualized the quantitative findings. General positive or unspecified feedback (n = 18) and perceived learning and practice value (n = 12) were the most frequently identified categories, suggesting that participants generally evaluated the platform favorably and recognized its potential as a complementary resource for English practice. However, many responses provided limited detail concerning specific learning processes. Enjoyment and speaking confidence (n = 2) and reduced anxiety (n = 1) emerged as individual experiences rather than widespread qualitative themes. Additionally, one participant expressed concerns regarding scenario quality, emphasizing the importance of considering technological limitations alongside perceived benefits. Taken together, these findings highlight the need to distinguish favorable attitudes toward immersive technologies from demonstrated educational outcomes.

From a pedagogical perspective, the findings suggest that effective VR integration should combine opportunities for independent practice with purposeful instructional guidance. Before engaging with ImmerseMe, teachers could implement brief orientation activities to familiarize students with the platform's navigation, communicative scenarios, and learning objectives. Pre-VR goal-setting tasks could encourage learners to identify specific vocabulary, communicative functions, or interactional strategies they intend to practice. During VR sessions, students could be encouraged to monitor their participation, repeat challenging scenarios, and identify linguistic difficulties requiring further attention. Following each session, structured reflective journals could prompt learners to evaluate their performance, identify successful communication strategies, describe areas for improvement, and establish goals for subsequent practice. Teacher-guided debriefing discussions and peer exchanges could further support the transfer of insights from virtual scenarios to classroom communication and independent language learning. These activities represent pedagogical recommendations informed by the study's findings rather than interventions whose effectiveness was directly evaluated.

The findings also have implications for educational technology developers and higher education institutions. For developers, favorable perceptions of usability and interactivity highlight the value of designing immersive platforms that facilitate learner control while incorporating accessible navigation, progress-monitoring features, goal-setting tools, and post-task reflective prompts. The isolated concern regarding scenario quality also suggests the importance of maintaining technically reliable and visually coherent learning environments. For institutions, differences in perceived immersion reinforce the relevance of technological infrastructure, technical assistance, digital literacy, and teacher preparation. Rather than adopting VR primarily because of its innovative characteristics, curriculum designers should consider how these environments can complement existing instructional objectives, learner needs, and opportunities for reflection.

The study's limitations include its reliance on self-reported data, its sample of 34 students from a single institutional context, and the limited explanatory depth of many open-ended responses. Future research should investigate whether favorable perceptions translate into sustained autonomous learning behaviors and measurable language development. Longitudinal studies incorporating classroom observations, platform usage data, learner

interviews, and reflective journals could provide a more comprehensive understanding of how VR experiences influence self-regulation over time. Comparative research across institutions could also clarify the role of technological familiarity, infrastructure, and contextual conditions in shaping immersive language learning experiences.

In general, this study contributes to understanding learner autonomy as a dynamic process shaped by the interaction of learner agency, reflective practices, and technological opportunities rather than as an automatic consequence of immersion. For EFL educators and curriculum designers, the broader pedagogical implication is that the educational value of virtual reality lies not merely in creating immersive experiences, but in designing purposeful learning environments that empower students to establish meaningful goals, reflect critically on their progress, and assume increasing responsibility for their language learning.

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