



The influence of Roblox gameplay on vocabulary acquisition in teenagers English learner

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RESUMEN

Este estudio examinó los cambios en el desempeño del vocabulario en inglés y en la participación en el aula durante una intervención estructurada basada en Roblox con adolescentes que aprendían inglés como lengua extranjera en Ecuador. Se combinó un diseño preexperimental de un solo grupo con observación de aula. Trece estudiantes de 12 a 17 años realizaron una prueba de vocabulario de 10 ítems antes y después de la intervención y participaron en diez sesiones de dos horas durante tres meses. Las sesiones utilizaron simulaciones, experiencias sociales y desafíos de supervivencia seleccionados en Roblox para promover el uso del vocabulario meta mediante la descripción, la colaboración y la resolución de problemas. La media aumentó de 4.85 (DE = 1.07) a 8.46 (DE = 0.78), con una ganancia media intraparticipante de 3.62 puntos, IC del 95% [3.31, 3.92]. Una prueba exploratoria de muestras relacionadas mostró una diferencia intragrupal estadísticamente confiable, $t(12) = 25.74$, $p < .001$. Las observaciones del registro de aula también documentaron una participación más frecuente, colaboración entre pares y uso de palabras meta durante las tareas, aunque las limitaciones de conectividad y acceso a dispositivos interrumpieron algunas sesiones. Los hallazgos son compatibles con la literatura que relaciona los juegos digitales y los entornos inmersivos con la exposición contextualizada y el compromiso, pero no demuestran que Roblox haya causado las mejoras. El tamaño muestral reducido, la ausencia de un grupo de comparación, la prueba breve elaborada por el investigador, los posibles efectos de práctica y novedad y la falta de una medición diferida limitan sustancialmente las inferencias. Roblox debe entenderse como un entorno complementario potencialmente útil cuando las actividades se seleccionan con cuidado, se estructuran pedagógicamente y se moderan de forma segura.

Palabras clave: adolescentes aprendices de inglés; aprendizaje de lenguas basado en juegos digitales; Ecuador; Roblox; vocabulario; entornos virtuales.

ABSTRACT

Sustained attention is still developing in early childhood and is sensitive to the design of learning activities and environments. This study examined changes in observed attention during a three-month sensory-play intervention embedded in English lessons at a private school in Pedernales, Ecuador. A one-group pre-experimental design was used with six children aged 5-6 years. The intervention incorporated plasticine, paint, flour, and materials with contrasting textures into teacher-guided language activities. Participant-level attention durations were obtained from the manuscript's embedded pre/post chart, and classroom logbook entries and teacher interview notes were used to interpret patterns of participation, motivation, and self-regulation. Mean observed attention increased from 2.50 minutes (SD = 0.55) before the intervention to 6.50 minutes (SD = 1.05) afterward; all six children improved, with a mean gain of 4.00 minutes. An exact Wilcoxon signed-rank test indicated a pre/post difference ($T = 0$, $p = .031$). Qualitative records described fewer interruptions, more active material exploration, greater willingness to participate, and more orderly transitions. These findings are consistent with research linking play, choice, embodied activity, and multisensory materials to engagement. Nevertheless, the small sample, absence of a comparison group, non-standardized attention measure, and possible novelty and observer effects prevent causal attribution. Structured sensory play should therefore be treated as a promising supplementary practice whose intensity, materials, and degree of choice require careful adaptation to individual children and classroom conditions.

Keywords: sensory play; sustained attention; early childhood education; English language learning; multisensory learning; Ecuador.

INTRODUCTION

Vocabulary knowledge is central to learners' ability to comprehend and produce a second or foreign language and involves knowledge of word form, meaning, and use across different contexts. Because this knowledge develops incrementally, vocabulary learning generally requires repeated encounters with words and opportunities to retrieve and use them meaningfully (Nation, 2022; Schmitt & Schmitt, 2020). Digital game-based language learning has attracted attention because games can combine repeated encounters with words, immediate goals, multimodal cues, and opportunities to use language while acting. Reviews of this field report generally positive vocabulary, language, affective, and participation outcomes, while also showing that results depend on game design, learner characteristics,

instructional support, and the duration and quality of exposure (Acquah & Katz, 2020; Hung et al., 2018; Zou et al., 2021).

A recent review of digital game-based and game-enhanced language learning similarly emphasizes that educational outcomes depend on pedagogical integration, game design, teacher preparation, and the characteristics of the learners and instructional context (Reinhardt & Bain, 2026). These findings support cautious experimentation with games in EFL classrooms, but they do not imply that any popular commercial platform will automatically produce learning.

Roblox is especially relevant to this discussion because it is not a single game or a standardized educational program. It is a user-generated platform containing a large and heterogeneous collection of experiences. Research on 1,301 Roblox fighting games shows that users' choices and the popularity of content are influenced by creator-level signals, illustrating how strongly experiences can vary across the platform (Kang et al., 2024). A systematic review of 40 studies on Roblox in learning similarly found potential benefits for social and collaborative learning, cognitive and noncognitive outcomes, and virtual practice, while identifying inadequate instructional design, cybersecurity, and cyberbullying as persistent concerns (Han et al., 2023). Consequently, educational claims should be attached to specific, curated activities and teaching arrangements, not to the Roblox brand in the abstract.

The broader educational metaverse literature reaches a comparable conclusion. Systematic and narrative reviews describe immersive environments as potentially valuable for experiential, interactive, and flexible learning, but they also emphasize uneven evidence, technical barriers, privacy risks, and the need to connect technology to explicit pedagogical purposes (Braguez et al., 2023; De Felice et al., 2023). Braguez et al. (2023), in particular, recommend using metaverse technologies as a complement when justified rather than treating them as a full-time replacement for established instruction. This distinction is important for small schools and settings where internet connectivity and device access can determine whether an otherwise promising activity is feasible.

Evidence from language education is promising but mixed. A systematic review of metaverse-based blended English learning links immersive environments to engagement and academic outcomes while identifying digital literacy and institutional support as necessary conditions (Li & Yu, 2023). In a Chinese open-university course, a curriculum-aligned virtual-reality model supported English performance and authentic practice, although the adult and open-education setting limits direct transfer to adolescents (Yuan et al., 2023). With high-school EFL learners, Çelik and Baturay (2024) found stronger vocabulary learning and retention,

engagement, presence, and community feeling in metaverse-based instruction, although the difference in social presence was not statistically significant. In a larger study of 336 seventh-grade students, Lee and Ko (2025) found a more differentiated pattern: face-to-face instruction was superior for speaking, textbook instruction was superior for listening, vocabulary gains were similar across instructional modes, and metaverse classes appeared particularly useful for reducing peer pressure and engaging self-conscious learners. The current evidence therefore supports affordance-specific arguments rather than a claim of general technological superiority.

Learners' willingness and capacity to use immersive environments also matter. Xie et al. (2026) found that self-efficacy, perceived usefulness, hedonic motivation, ease of use, social influence, and facilitating conditions shaped Generation Z students' adoption of metaverse-based English learning. These factors suggest that engagement can arise from both pedagogical value and enjoyment, but actual use still depends on access, confidence, and support. With minors, safety must be treated as part of instructional design. Tunca's (2026) analysis of parental discussions about Roblox identified concerns related to digital safety, screen time, emotional well-being, financial exposure, and social interaction, reinforcing the need for adult mediation, protected settings, and explicit boundaries during school use.

Despite the growth of research, the literature remains geographically concentrated. Reviews of digital game-based L2 learning show that much of the empirical work has been conducted in East Asia and the Middle East, with fewer classroom studies involving school-age learners in Latin American EFL contexts (Acquah & Katz, 2020; Hung et al., 2018). The present study contributes a small-scale case from Pedernales, Manabí, Ecuador. Its purpose is not to establish the causal effectiveness of Roblox, which the design cannot support, but to document score changes and classroom patterns during a structured intervention. Therefore, the study addressed two questions: (1) How did participants' scores on a 10-item target-vocabulary measure change from pre-test to post-test? and (2) What patterns of participation, collaboration, vocabulary use, and implementation difficulty were documented in the classroom logbook?

Theoretical Framing: From Platform Affordances to Structured Vocabulary Practice

The relevant learning mechanism in this study is contextualized practice rather than immersion by itself. Digital games can place words within goals, objects, actions, visual cues, feedback, and peer interaction. Reviews of digital game-based vocabulary learning identify repeated exposure, motivation, reduced anxiety, and interaction as recurring benefits, while emphasizing that task design and the match between game features and learning objectives remain decisive (Acquah &

Katz, 2020; Hung et al., 2018; Zou et al., 2021). For vocabulary learning, a platform is pedagogically useful when it makes target words necessary or helpful for understanding instructions, describing events, coordinating actions, and completing tasks.

This distinction also helps explain why evidence from Roblox and other metaverse applications varies. Payonpak et al. (2025) designed a Roblox simulation around lean-process standards and reported gains in workers' analytical thinking after participants engaged with realistic, task-specific scenarios. Although the population and content differ from adolescent EFL learning, the study illustrates the importance of aligning a virtual experience with defined outcomes. Sangamuang et al. (2026) likewise found that a Roblox library orientation generated greater intrinsic reward, whereas a traditional tour produced stronger focused attention and perceived usability; both formats improved knowledge and reduced anxiety. These results suggest that immersive environments may be particularly effective for motivation or affective access while conventional instruction can remain stronger for other outcomes.

Accordingly, this study treats Roblox as a supplementary activity system with four relevant features: multimodal representation, goal-directed exposure, social coordination, and affective engagement. The model is conditional. The platform may support vocabulary learning when teachers curate appropriate experiences, connect words to tasks, guide interaction, and provide sufficient access. It may be ineffective or unsafe when students enter unmoderated experiences, when language use is incidental to the learning goal, or when technical problems consume instructional time (Han et al., 2023; Tunca, 2026).

METHODS

Design and Setting

The study used a one-group pre-test-post-test pre-experimental design with an embedded qualitative observation component. It was conducted in a private school in Pedernales, Manabí, Ecuador. The design permits a description of within-group change during the intervention but cannot rule out alternative explanations such as repeated testing, maturation, teacher effects, concurrent learning, or novelty. For that reason, the revised report consistently uses the terms change, gain, and association rather than causal effect.

Participants

The broader school population described in the source manuscript comprised 39 students and teachers. The analytic sample consisted of 13 adolescent EFL learners aged 12-17. Participants were selected through a nonprobability process based on availability and interest in digital

environments. The small, context-specific sample was suitable for exploratory classroom work but was not intended to represent adolescents in Ecuador or EFL learners more broadly.

Intervention

The intervention consisted of ten two-hour instructional sessions delivered over three months (20 instructional hours in total). Students participated in selected Roblox simulations, social experiences, and survival challenges. The activities were integrated into English lessons so that learners encountered and used target vocabulary while following instructions, describing in-game events, collaborating with classmates, and solving tasks. The source manuscript identifies earthquake, transportation, development, permission, discovery, and calamity among the target words that appeared repeatedly during the sessions. Because Roblox contains user-generated and highly variable content, the findings apply to the curated experiences and teacher-guided tasks used in this intervention, not to the platform as a whole (Kang et al., 2024).

Data Sources

Vocabulary performance was measured with a researcher-developed 10-item pre-test and a parallel 10-item post-test based on the vocabulary addressed in the intervention. The source material did not provide evidence of external validation, item difficulty, reliability, or equivalence beyond the shared instructional content. The classroom logbook recorded participation, motivation, collaboration, and observed use of English vocabulary during the ten sessions. Teacher interviews were listed in the original data-collection plan; however, no transcripts, coding procedures, quotations, or distinct interview findings were supplied. To avoid inventing evidence, the revised results rely on the vocabulary scores and classroom logbook only.

Table 1. *Data Sources and Their Analytic Role*

Data source	Indicator	Analytic use	Evidence boundary
10-item pre-test	Baseline recognition/use of target words	Descriptive baseline and paired comparison	Researcher-developed; validation evidence not supplied
10-item post-test	Recognition/use of target words after ten sessions	Descriptive outcome and paired comparison	Immediate post-test only; no delayed retention measure
Classroom logbook	Participation, collaboration, motivation, and vocabulary use	Descriptive organization of recurring observations	No independent observer or formal coding reliability
Teacher interviews	Teacher perceptions	Not used in revised findings	Transcripts, analytic procedures, and reportable results unavailable

Note. The table distinguishes evidence retained in the revised manuscript from material that was mentioned but not sufficiently documented for analysis.

Data Analysis

Pre-test and post-test scores were summarized using means, standard deviations, ranges, and individual change scores. A paired-samples t test and a 95% confidence interval for the mean difference were calculated as exploratory within-sample statistics. Because the measure was

brief and researcher-developed and the sample was small and uncontrolled, statistical significance should not be interpreted as evidence that Roblox caused the observed change. Logbook summaries were organized descriptively around recurring patterns of contextualized vocabulary use, participation and collaboration, and implementation constraints. No claims were added beyond the evidence reported in the source manuscript.

RESULTS AND DISCUSSION

Vocabulary Scores

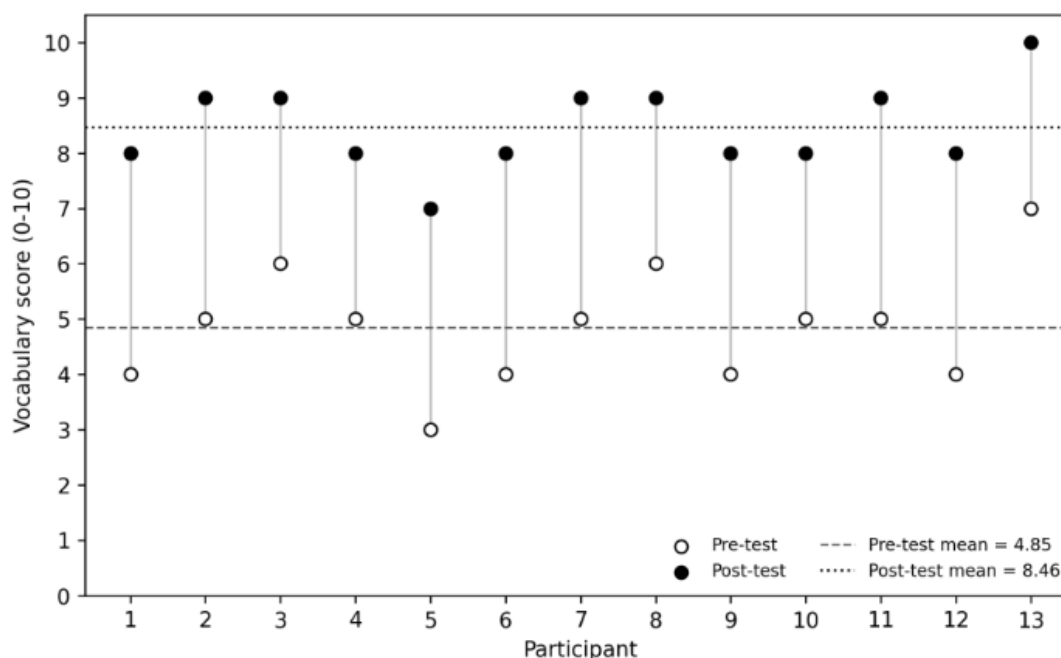
All 13 participants obtained a higher post-test score than pre-test score. Pre-test scores ranged from 3 to 7 and averaged 4.85 (SD = 1.07). Post-test scores ranged from 7 to 10 and averaged 8.46 (SD = 0.78). The mean gain was 3.62 points (SD = 0.51), with individual gains of three or four points. The 95% confidence interval for the mean gain was [3.31, 3.92]. An exploratory paired-samples analysis indicated a statistically reliable within-group difference, $t(12) = 25.74$, $p < .001$. Figure 1 displays each participant's paired scores.

Table 2. Descriptive Statistics for Vocabulary Scores

Measure	n	M	SD	Minimum	Maximum
Pre-test	13	4.85	1.07	3	7
Post-test	13	8.46	0.78	7	10
Change score	13	3.62	0.51	3	4

Note. Scores were measured on a 0-10 scale. Change score = post-test minus pre-test.

Figure 1. Individual Pre-Test and Post-Test Vocabulary Scores



Note. Each vertical line connects one participant's pre-test and post-test scores. Dashed and dotted horizontal lines indicate the respective group means.

Classroom Logbook Patterns

The logbook summaries documented three recurring patterns. First, target words were used in context as students described virtual situations, interpreted instructions, and completed tasks. The listed examples -earthquake, transportation, development, permission, discovery, and calamity -were connected to visible objects, events, and actions in the selected experiences. This pattern is consistent with the intervention's aim of moving vocabulary practice beyond isolated memorization.

This distinction is important because language-learning motivation is dynamic and context-sensitive; increased participation during particular activities should not automatically be interpreted as evidence of a stable motivational change (Dörnyei, 2020).

Second, the observations described increased willingness to participate during speaking and group activities. Students collaborated with classmates, described in-game events, and used new vocabulary while coordinating actions. These observations indicate that the sessions created occasions for language use and peer interaction. They do not, however, establish that motivation or communicative confidence increased beyond the observed sessions because no validated affective measure was administered.

Third, implementation was uneven. Poor internet connectivity and restricted device access made it difficult to complete some planned Roblox activities. These constraints are analytically important because they qualify for the apparent engagement benefits: the learning environment depended on facilitating conditions that were not consistently available.

Table 3. *Summary of Qualitative Observation Patterns*

Pattern	Documented classroom evidence	Cautious interpretation
Contextualized vocabulary use	Students used target words while describing events, interpreting situations, and completing tasks.	Selected activities created occasions to connect words with actions and visual cues.
Participation and collaboration	Students appeared more willing to speak, work with peers, and describe in-game scenarios.	Engagement was observed during sessions, but no validated motivation or anxiety scale was used.
Implementation constraints	Connectivity and device limitations interrupted some planned activities.	Access and technical support were conditions of successful implementation, not peripheral issues.

Note. The table reports descriptive patterns from the classroom logbook. It does not present interview findings or claim thematic saturation.

Discussion

The study documented a substantial increase in scores on the 10-item target-vocabulary measure after ten Roblox-supported sessions. The result is consistent with systematic reviews showing that digital games can support vocabulary learning through contextualized exposure, interaction, feedback, and engagement (Acquah & Katz, 2020; Hung et al., 2018; Zou et al., 2021). It also aligns with Çelik and Baturay's (2024) controlled study, which reported improved vocabulary learning and retention among high-school learners in a metaverse-based condition. In the present classroom, words were tied to visible situations and goal-directed actions, and all students improved by three or four points. This uniform change is noteworthy within the sample but should be interpreted in relation to the immediate, instruction-aligned test.

Earlier research also found that participation in digital gameplay could lower affective barriers and increase learners' willingness to communicate in English, although that evidence came from a

small university-level sample and should not be generalized directly to adolescents (Reinders & Wattana, 2015).

The findings do not show that Roblox is inherently more effective than conventional teaching. Lee and Ko (2025) found similar vocabulary gains across metaverse, face-to-face, and textbook conditions, even as the modes differed for speaking, listening, peer pressure, and engagement. Their study suggests that adequate exposure and instructional focus may matter more for vocabulary than the delivery platform itself. The current study cannot separate the contribution of Roblox from repeated teaching, teacher guidance, practice with the same vocabulary domain, or the motivational novelty of the intervention. The most defensible conclusion is that the selected Roblox activities functioned as a workable context for a period of structured vocabulary practice.

This interpretation is reinforced by studies outside language education. Payonpak et al. (2025) reported gains after a Roblox simulation was deliberately designed around industrial quality-testing tasks, demonstrating that platform-based learning benefits are linked to task alignment. Sangamuang et al. (2026) found a trade-off in library orientation: Roblox produced greater intrinsic reward, whereas the traditional format yielded stronger focused attention and usability. Together, these studies caution against treating engagement and knowledge acquisition as interchangeable. In the Ecuadorian intervention, increased classroom participation may have supported practice, but engagement alone cannot validate the accuracy, depth, or durability of vocabulary knowledge.

Roblox's user-generated structure makes curation especially important. Kang et al. (2024) show that game selection on Roblox is shaped by creator and popularity signals, while Han et al. (2023) emphasize that the platform's educational value coexists with inconsistent design and safety risks. Therefore, the unit of pedagogical analysis should be the selected experience plus the teacher-designed activity, not Roblox as a single intervention. Teachers need to examine whether an experience elicits the target language, whether its rules and visual demands are age-appropriate, and whether participation can occur in a protected and manageable setting.

The observed participation patterns are compatible with the wider language-metaverse literature. Yuan et al. (2023) link curriculum-aligned virtual practice to authentic experience and English performance, and Li and Yu (2023) identify engagement as a central pathway while stressing the need for digital literacy and institutional support. Xie et al. (2026) similarly show that

self-efficacy, usefulness, enjoyment, ease of use, social influence, and facilitating conditions shape adoption. The connectivity and device problems recorded in Pedernales are therefore not minor logistical details. They may determine who can participate, how much instructional time remains available, and whether the activity reduces or reproduces educational inequalities.

A balanced implementation must also address minors' safety and well-being. Tunca (2026) found that parents' Roblox discussions combine concerns about safety, screen time, emotional well-being, financial exposure, and social interaction. Han et al. (2023) likewise identify cyberbullying and cybersecurity as educational challenges. School use should therefore include age-appropriate accounts, private or tightly controlled participation where possible, disabled or restricted transactions, explicit rules for communication and personal information, active adult supervision, and a clear procedure for reporting inappropriate content. These safeguards are part of the pedagogy because insecurity or unregulated interaction can undermine participation and learning.

The study's setting adds contextual value. Reviews have noted the concentration of digital game-based language research in a limited set of regions and the need for more evidence with school-age learners and varied infrastructures (Acquah & Katz, 2020; Hung et al., 2018). A small study from coastal Ecuador cannot close that gap, but it shows how an internationally popular platform interacts with local classroom conditions. The gains and engagement were accompanied by device and connectivity constraints, illustrating why educational technology studies should report both learning indicators and the material conditions that make participation possible.

The findings support a supplementary, hybrid approach. Braguez et al. (2023) argue that metaverse applications should complement established learning when pedagogically justified, and De Felice et al. (2023) similarly frame immersive education in terms of both opportunities and risks. Roblox activities can be used for guided practice, simulation, and collaborative description, while explicit teaching, feedback, reading, writing, and assessment remain necessary. The practical contribution of the intervention is therefore a design principle: begin with a vocabulary objective, choose or build a safe experience that makes the words functional, structure interaction, and assess learning independently of game completion.

Limitations and Directions for Future Research

Some limitations may constrain the conclusions. First, the study included only 13 students from one private school and used a nonprobability sample. Second, the one-group design had no control or comparison condition, so the score increase cannot be attributed specifically to Roblox. Third, the 10-item test was researcher-developed and closely aligned with the intervention; information about reliability, validity, item equivalence, and scoring procedures was unavailable. The post-test was immediate, leaving retention unknown. Repeated testing and familiarity with the target words may also have contributed to the gains.

Fourth, the qualitative evidence consisted of summarized classroom observations. No independent observer, formal coding protocol, intercoder agreement, participant quotations, or interview corpus was available. The apparent increase in motivation was not measured on a validated scale. Fifth, the age range was broad, and the manuscript did not provide proficiency levels, prior Roblox experience, gender distribution, socioeconomic information, or individual patterns of attendance. Sixth, technical constraints affected intervention fidelity, but the number and duration of disrupted sessions were not recorded.

Future studies should use larger samples, validated receptive and productive vocabulary measures, a comparison group, delayed post-tests, and a clear record of exposure and attendance. Designs should distinguish between learning attributable to explicit instruction, game-mediated practice, and general time on task. Qualitative work should include interview protocols, systematic coding, and student perspectives, particularly from learners who do not enjoy gaming or have limited digital access. Researchers should also report on the exact Roblox experiences, privacy and moderation settings, instructional prompts, target vocabulary, and technical requirements so that the intervention can be evaluated and replicated.

CONCLUSIONS

During a 20-hour, teacher-guided Roblox intervention, 13 adolescent EFL learners in Ecuador improved their scores on a 10-item target-vocabulary measure and displayed more classroom participation, collaboration, and contextual use of selected words. These results make Roblox a plausible supplementary environment for structured vocabulary practice in this setting. They do not demonstrate causal effectiveness or superiority over conventional instruction. The strongest educational case for Roblox rests on careful curation, explicit language objectives, guided interaction, adequate technical access, and robust safeguards

for minors. Future controlled and longitudinal research is needed before broader claims can be made about vocabulary retention or generalizable learning benefits.

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