

ARTICLE

Motivating Left-Behind Vocational Students in English Learning through Game-Based Listening Activities: The Interaction between Self-Esteem and Listening Comprehension Skills

Jinghui Yu ^{ID}, Rohaya Abdullah * ^{ID}

School of Educational Studies, Universiti Sains Malaysia, Gelugor 11800, Pulau Pinang, Malaysia

ABSTRACT

To enhance the motivation of left-behind vocational students to learn English, exploring innovative ways of learning English suitable for such students. This study investigates the effectiveness of game-based listening activities in improving English language learning among left-behind vocational students in China. Employing a quasi-experimental design, the research examined the impact of the intervention on learning motivation and listening comprehension skills, while considering the moderating effects of self-esteem and various environmental factors. A sample of 198 left-behind vocational students participated in the study, with 99 in the experimental group and 99 in the control group. Results revealed significant improvements in overall motivation ($d = 0.79$) and listening comprehension skills ($d = 0.92$) for the experimental group. Notably, intrinsic motivation showed a larger increase ($d = 0.85$) compared to extrinsic motivation ($d = 0.31$). Self-esteem was found to moderate the intervention's effectiveness, with higher self-esteem associated with greater improvements. Environmental factors, particularly access to technology and school support, significantly influenced learning outcomes. The study provides evidence for the efficacy of game-based approaches in addressing the unique challenges faced by left-behind vocational students and highlights the importance of considering individual psychological factors and environmental contexts in educational interventions. Future research should focus on the long-term efficacy, scalability, and methods to cater to students with varying levels of self-esteem and environmental support.

Keywords: Game-Based Learning; Left-Behind Students; Vocational Education; English Language Learning; Listening

*CORRESPONDING AUTHOR:

Rohaya Abdullah, School of Educational Studies, Universiti Sains Malaysia, Gelugor 11800, , Pulau Pinang, Malaysia; Email: rohayamfda@usm.my

ARTICLE INFO

Received: 15 October 2024 | Revised: 6 November 2024 | Accepted: 11 November 2024 | Published Online: 15 January 2025

DOI: <https://doi.org/10.30564/fls.v7i1.7509>

CITATION

Yu, J., Abdullah, R., 2025. Motivating Left-Behind Vocational Students in English Learning through Game-Based Listening Activities: The Interaction between Self-Esteem and Listening Comprehension Skills. *Forum for Linguistic Studies*. 7(1): 1033–1045. DOI: <https://doi.org/10.30564/fls.v7i1.7509>

COPYRIGHT

Copyright © 2025 by the author(s). Published by Bilingual Publishing Co. This is an open access article under the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License (<https://creativecommons.org/licenses/by-nc/4.0/>).

Comprehension; Self-Esteem; Motivation; Environmental Factors

1. Introduction

In the context of the dual urban-rural development system, as our country's social economy progresses rapidly, a significant number of workers have migrated to developed regions, whether voluntarily or involuntarily. Consequently, underdeveloped areas have witnessed a sharp increase in vulnerable populations, particularly left-behind students. Left-behind students are defined as children who, due to their parents' employment in distant locations, are compelled to stay in their hometowns for education, resulting in prolonged separation from one or both parents. Meanwhile, the responsibility for their care, education, and supervision falls on other elderly family members. Students enrolled in vocational colleges are physiologically of the same age as those in ordinary high schools. While they possess keen minds, their perspectives can be unilateral and occasionally prone to extremism. Despite their enthusiasm, they may also be impulsive and subject to significant psychological fluctuations. Compared to students in elementary and junior high schools, their self-awareness has notably enhanced, and their capacity for independent thinking and problem-solving is progressively developing. However, they continue to crave the attention and affection of elders and educators. This age group constitutes a pivotal stage in personal development and a crucial period for the formation and development of character. Hence, it is imperative to customize education to cater to the needs of these students in the teaching process.

In recent years, the educational paradigm has experienced a substantial transformation, particularly in the domain of language pedagogy, with a pronounced inclination towards innovative instructional methodologies. Among these, game-based learning has surfaced as a particularly efficacious modality for engaging learners and augmenting their educational experiences^[1]. This paradigmatic shift is notably germane to the context of marginalized vocational students, a demographic frequently encountering distinctive challenges in their educational pursuits. The confluence of game-based learning, with a specific emphasis on listening exercises, and the psychological constructs of self-esteem and listening comprehension skills, constitutes a fecund area

for scholarly inquiry and pedagogical innovation.

The paradigm of game-based learning has attracted significant scholarly interest within the domain of educational research, as evidenced by studies that underscore its efficacy in enhancing student learning outcomes^[2]. This pedagogical strategy capitalizes on the intrinsic motivational attributes of games to cultivate immersive and interactive educational milieus. Within the context of English as a Second Language (ESL) pedagogy, game-based learning has exhibited considerable potential in engendering positive attitudes among educators and learners alike^[3]. The gamification of educational content not only augments engagement but also holds the promise of mitigating the trend of diminishing attention spans among current students^[4].

However, the effectiveness of game-based learning is not consistent across all learners. Various factors, including anxiety levels, can have a significant impact on both learning and gaming performance within game-based learning environments^[5]. This variability highlights the crucial importance of taking into account individual psychological factors, such as self-esteem, when designing and implementing game-based learning strategies. Furthermore, the interplay between self-efficacy and learning performance in game-based English learning environments has been documented^[6], indicating a complex relationship between psychological constructs and learning outcomes. It is essential to recognize that not all learners will respond uniformly to game-based learning approaches, and this understanding should guide the development of tailored educational experiences that cater to the diverse needs and psychological profiles of learners. By doing so, educators and designers can create more effective and inclusive game-based learning environments that enhance the educational experience for a broader range of individuals.

The emphasis on the cohort of left-behind vocational students introduces an additional layer of complexity to the present research endeavor. These individuals frequently encounter distinctive socio-economic obstacles that can significantly influence their educational trajectories and outcomes. Through an exploration of the interplay between self-esteem and listening comprehension proficiencies within the framework of game-based learning, this investigation seeks to

illuminate efficacious methodologies for stimulating and bolstering this vulnerable demographic. The potential of game-based methodologies to augment higher education student class participation^[7] further accentuates the pertinence of this research in tackling the multifaceted challenges confronted by left-behind vocational students.

Delving into this investigative journey necessitates a comprehensive consideration of the broader implications that the integration of game-based learning may have on the educational paradigm. The transformation of learning experiences into game-like environments transcends mere engagement; it holds profound potential to cultivate the development of critical 21st-century skills and to revolutionize the assessment of learning outcomes^[8]. This study endeavors to elucidate the intricate interrelationship between participation in game-based listening exercises, the enhancement of self-esteem, and the improvement of listening comprehension skills. Through this endeavor, it seeks to contribute valuable insights to the burgeoning repository of efficacious teaching methodologies that address the diverse needs of learners in our increasingly digitalized world.

2. Materials and Methods

2.1. Literature Review

In recent years, the body of literature pertaining to the utilization of game-based learning within educational settings has seen a significant expansion. This surge in research and publications underscores a mounting acknowledgment of the transformative potential that game-based learning holds for pedagogical methodologies. A comprehensive systematic mapping study conducted by Dicheva et al.^[3] brought to light the wide array of applications that gamification can offer in educational contexts. The study emphasized how the integration of game elements into learning environments can markedly enhance student engagement and motivation, thereby enriching the overall educational experience. This burgeoning trend is especially pertinent in the realm of language learning, where conventional teaching methods frequently encounter difficulties in sustaining the interest and active participation of students. The traditional approaches, often rooted in rote memorization and repetitive drills, can fall short in capturing the imagination and enthusiasm of learners, particularly in the digital age where interactive and

dynamic content is the norm. Adipat et al.^[1] delve into the foundational principles of engaging students through the lens of game-based learning, highlighting its unique capacity to create immersive and interactive experiences that not only captivate learners but also facilitate the process of language acquisition. By leveraging the principles of gamification, educators can tap into the intrinsic motivation of students, making the learning process more enjoyable and effective. The interactive nature of games allows students to practice language skills in a safe, low-stakes environment, which can lead to improved retention and a deeper understanding of the language being learned. Moreover, the use of game-based learning in language education can cater to different learning styles and preferences, accommodating visual, auditory, and kinesthetic learners.

In the realm of teaching English as a Second Language (ESL), researchers Alhebshi and Halabi^[2] embarked on a study to delve into the perspectives of both educators and students regarding the integration of game-based learning into the curriculum. Their investigation uncovered that, for the most part, there exists a favorable disposition towards this innovative pedagogical approach, with a shared acknowledgment of its capacity to bolster and improve various language skills. This positive sentiment is echoed in the findings of another research group, led by Bai et al.^[4], whose comprehensive meta-analysis meticulously examined a multitude of studies and provided robust evidence supporting the notion that the gamification of learning can indeed yield beneficial effects on student achievement across a wide array of educational settings. Nevertheless, it is crucial to acknowledge that the efficacy of game-based learning methodologies is not universally consistent or without its challenges. This is evidenced by the work of Yang et al.^[5], who conducted a detailed examination into the influence of anxiety levels on the outcomes of learning and gaming performance within the specific context of game-based learning environments. Their research brought to light that individual differences, such as varying levels of anxiety, can significantly impact how effectively students engage with and benefit from game-based learning experiences.

The psychological facets of game-based learning, particularly concerning self-esteem and motivation, have been the subject of extensive investigation by numerous scholars. Garcia Bacete and Doménech Betoret^[6] underscored the in-

tricate interplay among motivation, learning, and academic performance, furnishing a theoretical framework that elucidates the potential impact of game-based methodologies on student engagement and academic success. Building upon this foundation, Yang et al.^[7] scrutinized the influence of badge systems on self-efficacy and learning outcomes within game-based English language learning contexts, uncovering nuanced interactions between psychological variables and educational achievements.

The unique challenges encountered by students left behind in vocational education settings add a further layer of complexity to this already intricate research domain. In their study, Hernández and Espinoza Caro^[8] pinpointed a myriad of factors that influence the learning of the English language among secondary school students, many of which are likely to be exacerbated for those in vocational education who find themselves in a state of abandonment. The potential of game-based approaches to tackle these multifaceted challenges is indeed promising. This is substantiated by the work of Pinter et al.^[9], who showcased the efficacy of gamification in significantly improving class attendance among higher education students, suggesting a pathway to engagement and success for those in vocational education who may feel neglected or disengaged.

As the field of game-based learning continues to evolve and expand, researchers are increasingly directing their attention towards its manifold applications in cultivating the essential skills required for the 21st century. Schaaf and Mohan^[10] delve into the utilization of game-based learning as a pedagogical tool, examining its efficacy in teaching, learning, and assessment within the contemporary educational landscape. Their exploration underscores the multifaceted benefits of this innovative approach, emphasizing its potential to transcend mere language acquisition. Indeed, game-based learning holds the promise of nurturing critical thinking, problem-solving, and collaborative skills—abilities that are indispensable for thriving in today's dynamic and interconnected workforce. This broader perspective on game-based learning not only acknowledges its versatility but also highlights its pivotal role in preparing individuals for the challenges and opportunities of the modern era.

2.2. Research Methods

2.2.1. Study Design

To address the research questions posited, this study adopts a quasi-experimental design featuring a pretest-posttest control group methodology^[11]. This method is often used to understand the effectiveness of interventions, with tests conducted before and after the intervention for comparison. This approach facilitates the evaluation of the efficacy of game-based listening activities on the English learning motivation of left-behind vocational students, while concurrently investigating the interplay between self-esteem and listening comprehension proficiencies. The research framework has been meticulously structured to delineate the intervention's effects, while accounting for and controlling potential confounding variables. The study encompasses two cohorts of left-behind vocational students: an experimental group engaging in game-based listening activities and a control group receiving conventional English instruction. Both cohorts will undergo pretesting to establish baseline metrics for self-esteem, English learning motivation, and listening comprehension skills. Subsequent to the intervention period, posttesting will be conducted to evaluate alterations in these variables^[12].

To ensure the integrity and reliability of the outcomes, this study will utilize standardized measurement instruments, including the Rosenberg Self-Esteem Scale^[13], a validated questionnaire assessing motivation for English language learning^[14], and a standardized test for English listening comprehension^[15]. Rosenberg Self-Esteem Scale includes ten questions to evaluate a person's attitude towards yourself reflects the level of self-esteem. The questionnaire includes 20 items such as motivation, integrativeness, attitudes toward the learning situation, language anxiety, instrumentality, etc. The standardized test for English listening comprehension is a test paper applicable to Chinese vocational students. The game-based listening activities for the experimental cohort will be meticulously crafted to be congruent with the curricular objectives, while seamlessly integrating gamification elements such as points, badges, and leaderboards^[16].

The research design that has been meticulously crafted for this study enables a thorough and detailed exploration of the intricate relationships and interactions that exist among game-based learning interventions, psychological variables, and the outcomes of language acquisition processes, specifically within the context of left-behind vocational students.

By thoughtfully integrating a combination of quantitative metrics and a tightly controlled experimental environment, the researchers are poised to deliver compelling and reliable evidence that supports the efficacy of game-based methodologies in boosting both the motivation to learn English and the overall proficiency levels achieved by the students^[17]. **Figure 1** illustrates the research framework that guided this investigation, demonstrating the interrelationships among key variables and the proposed pathways through which game-based listening activities may influence learning outcomes.

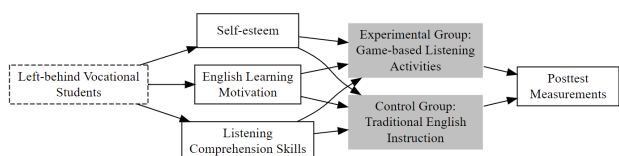


Figure 1. Research framework for investigating the effects of game-based listening activities on left-behind vocational students’ English learning.

2.2.2. Study Subjects

The study will focus on left-behind vocational students in a selected region of China, encompassing a sample of approximately 200 participants aged 15–16. These students are characterized by their rural background and the absence of one or both parents due to urban migration for work^[18]. The participants will be randomly assigned to experimental and control groups, with efforts made to ensure demographic balance between the groups. Selection criteria will include enrollment in vocational education programs, left-behind

status, and basic English language proficiency. Care will be taken to address ethical considerations, including obtaining informed consent from participants and their guardians, ensuring confidentiality, and providing support services if needed^[19]. This sample size and composition aim to provide a representative cross-section of the target population while allowing for statistically significant analysis of the intervention’s effects^[20].

2.2.3. Research Tools

The study will employ a range of validated research tools to measure the key variables. **Table 1** provides a comprehensive overview of the research instruments employed in this study, including their descriptions and corresponding references. For assessing self-esteem, the Rosenberg Self-Esteem Scale^[13] will be utilized, given its established reliability and validity across diverse populations. English learning motivation will be measured using an adapted version of the Language Learning Motivation Questionnaire^[21], which has been validated for use with Chinese students. Listening comprehension skills will be evaluated through a standardized English listening test, aligned with the participants’ educational level^[22]. The game-based listening activities for the experimental group will be developed using established gamification principles^[23], incorporating elements such as points, badges, and leaderboards to enhance engagement. All instruments will undergo piloting and necessary adaptations to ensure their appropriateness for the specific context of left-behind vocational students^[24]. The following table summarizes the research tools:

Table 1. Summary of research instruments.

Variable	Instrument	Description	Reference
Self-esteem	Rosenberg Self-Esteem Scale	10-item scale measuring global self-worth	[13]
English Learning Motivation	Adapted Language Learning Motivation Questionnaire	20-item questionnaire assessing intrinsic and extrinsic motivation	[21]
Listening Comprehension	Standardized English Listening Test	Comprehension test aligned with vocational curriculum	[22]
Game-based Learning Intervention	Custom-developed gamified listening activities	Interactive digital platform with gamification elements	[23]

2.2.4. Data Collection Procedures

The data collection procedure will follow a systematic approach to ensure consistency and reliability. Initially, all

participants will complete a pretest battery, including the Rosenberg Self-Esteem Scale, the adapted Language Learning Motivation Questionnaire, and the standardized English listening test^[24]. These assessments will be administered

under controlled conditions to minimize external influences. Following the pretest, the experimental group will engage in the game-based listening activities for a period of 12 weeks, while the control group continues with traditional English instruction^[25]. Throughout the intervention period, participant engagement and progress will be monitored through the digital platform. Upon completion of the intervention, all participants will undergo a posttest using the same instruments as the pretest, allowing for direct comparison of outcomes^[26]. Additionally, a subset of participants from the experimental group will be invited to participate in semi-structured interviews to gather qualitative insights into their experiences with the game-based learning approach^[27].

2.2.5. Data Analysis Method

The data analysis will employ a mixed-methods approach, combining quantitative statistical analyses with qualitative thematic analysis. Quantitative data will be processed using SPSS software, with initial descriptive statistics calculated to summarize sample characteristics and variable distributions. Paired t-tests and repeated measures ANOVA will be conducted to assess changes in self-esteem, motivation,

and listening comprehension within and between groups. To examine the interaction between self-esteem and listening comprehension skills, hierarchical multiple regression analyses will be performed. The study will also utilize structural equation modeling (SEM) to investigate the complex relationships among variables. For the qualitative data obtained from interviews, thematic analysis will be employed to identify recurring patterns and insights. To ensure the validity and reliability of the findings, triangulation of quantitative and qualitative results will be conducted, which means the investigator will also cross-validated the quantitative data and the results of the qualitative data, providing a comprehensive understanding of the intervention’s effects.

3. Results

3.1. Sample Characteristics Analysis

As shown in **Table 2**, the analysis of pretest scores revealed important insights into the participants’ initial levels of self-esteem, English learning motivation, and listening comprehension skills.

Table 2. Summary of pretest measures for self-esteem, English learning motivation, and listening comprehension.

Measure	Experimental Group (n = 99)	Control Group (n = 99)	Total (N = 198)
Self-esteem Score			
Mean (SD)	27.8 (5.2)	28.1 (5.4)	27.9 (5.3)
Range	15–38	16–39	15–39
English Learning Motivation			
Intrinsic - Mean (SD)	3.6 (0.8)	3.5 (0.9)	3.5 (0.85)
Extrinsic - Mean (SD)	4.1 (0.7)	4.0 (0.8)	4.05 (0.75)
Listening Comprehension			
Mean Score (SD)	62.4 (11.3)	61.8 (11.7)	62.1 (11.5)
Range	35–85	33–87	33–87

As shown in **Figure 2**, the relationship between self-esteem and listening comprehension scores demonstrates a positive correlation across both experimental and control groups. The scatter plot presented here offers a compelling visual representation of the initial correlation between self-esteem levels and listening comprehension scores for both the experimental and control groups participating in the study. By examining the regression lines plotted on the graph, we can observe a clear positive correlation between self-esteem and listening comprehension performance across both cohorts, albeit with some minor fluctuations in the intensity of

this relationship. This initial analysis provides a foundational understanding of how self-esteem and listening comprehension are interrelated before any intervention takes place. It sets the stage for a deeper exploration of these variables and will be instrumental in interpreting the impact of the game-based learning intervention in future analyses. The visual depiction of this data allows for a more intuitive grasp of the underlying dynamics at play, which will be essential for drawing meaningful conclusions from the study. Furthermore, the pretest data analysis indicates that the experimental and control groups possess comparable baseline characteristics,

thereby establishing a robust foundation for the intervention study. Although the experimental group exhibits slightly higher mean scores in both self-esteem and listening comprehension, these differences fall within the expected range of random variation. Consequently, there is no indication of significant preexisting differences between the two groups that could skew the results of the intervention. This parity ensures that any observed changes following the game-based learning intervention can be more confidently attributed to the effects of the program itself, rather than to pre-existing disparities between the groups.

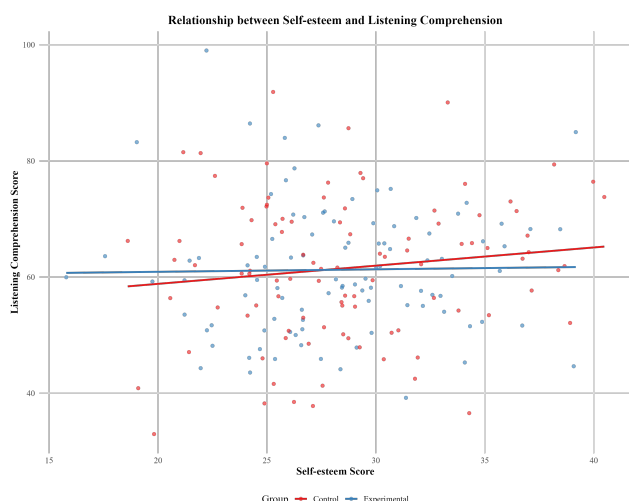


Figure 2. Relationship between self-esteem and listening comprehension scores for experimental and control groups.

3.2. Effect of Game-Based Listening Activities on Learning Motivation

The impact of game-based listening activities on learning motivation was examined through a comparative analysis of pre- and post-intervention scores for both experimental and control groups. As presented in **Table 3**, results revealed a significant increase in overall learning motivation for the experimental group, with particularly notable improvements in intrinsic motivation.

The experimental group demonstrated a statistically significant increase in both intrinsic ($t(98) = 5.83, p < 0.001, d = 0.79$) and extrinsic motivation ($t(98) = 2.35, p = 0.021, d = 0.31$), with a larger effect size observed for intrinsic motivation. In contrast, the control group showed no significant changes in either motivation type. This suggests that the game-based listening activities were particularly effective in fostering internal drive and enjoyment in the learning

process.

Figure 3 visualizes these changes in motivation scores, highlighting the differential impact of the intervention between experimental and control groups. This visualization clearly illustrates the differential impact of the game-based intervention on motivation types between the experimental and control groups. The steeper slope for intrinsic motivation in the experimental group underscores the intervention’s efficacy in enhancing internal drive for learning. The parallel lines for the control group indicate minimal changes in motivation over time without the game-based intervention. These findings suggest that incorporating game elements into listening activities can significantly boost students’ intrinsic motivation, potentially leading to more sustained engagement in language learning among left-behind vocational students.

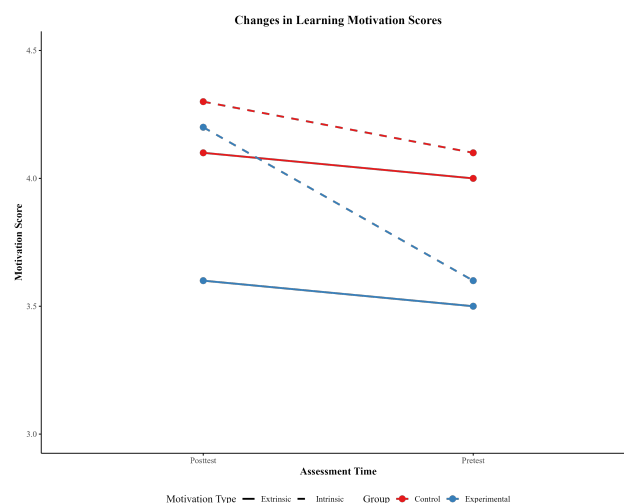


Figure 3. Changes in intrinsic and extrinsic motivation scores for experimental and control groups.

3.3. Interaction of Self-Esteem and Hearing Comprehension Ability

Table 4 presents the regression model outcomes, demonstrating a significant moderating effect of self-esteem on the relationship between the game-based intervention and improvements in listening comprehension. The analysis of the interaction between self-esteem and listening comprehension skills revealed a complex relationship that evolved over the course of the intervention. A hierarchical multiple regression analysis was conducted to examine this interaction, controlling for demographic variables and initial English proficiency. The results indicated a significant moderating effect

Table 3. Changes in learning motivation scores pre- and post-intervention.

Motivation Type	Group	Pretest Mean (SD)	Posttest Mean (SD)	Mean Difference	t-Value	p-Value	Cohen's d
Intrinsic	Experimental	3.6 (0.8)	4.2 (0.7)	0.6	5.83	<0.001	0.79
	Control	3.5 (0.9)	3.6 (0.8)	0.1	0.87	0.386	0.12
Extrinsic	Experimental	4.1 (0.7)	4.3 (0.6)	0.2	2.35	0.021	0.31
	Control	4.0 (0.8)	4.1 (0.7)	0.1	0.98	0.329	0.13
Overall	Experimental	3.85 (0.75)	4.25 (0.65)	0.4	4.44	<0.001	0.57
	Control	3.75 (0.85)	3.85 (0.75)	0.1	0.95	0.344	0.12

Table 4. Hierarchical multiple regression analysis predicting listening comprehension.

Predictor	Model 1 β	Model 2 β	Model 3 β
Group (Intervention)	0.28**	0.30**	0.32***
Initial English Proficiency	0.45***	0.43***	0.41***
Self-esteem		0.22**	0.24**
Group \times Self-esteem			0.18*
R ²	0.31	0.36	0.39
Δ R ²		0.05**	0.03*
F for Δ R ²	44.21***	18.76**	11.45*

Note: *p < 0.05, **p < 0.01, ***p < 0.001.

of self-esteem on the relationship between the game-based intervention and improvements in listening comprehension.

The interaction term (Group \times Self-esteem) in Model 3 demonstrates a significant positive effect ($\beta = 0.18, p < 0.05$), suggesting that the impact of the game-based intervention on listening comprehension was more pronounced for students with higher levels of self-esteem. This finding implies that self-esteem may play a crucial role in maximizing the benefits of game-based learning approaches for left-behind vocational students. As illustrated in **Figure 4**, the three-dimensional surface plot provides a visual representation of this complex interaction effect, demonstrating how self-esteem levels modulate the relationship between intervention group assignment and improvements in listening comprehension.

The steeper incline of the surface for the experimental group, particularly at higher levels of self-esteem, visually represents the synergistic effect of the game-based intervention and self-esteem on listening comprehension outcomes. This visualization underscores the importance of considering individual psychological factors when implementing game-based learning strategies, suggesting that interventions may be most effective when coupled with efforts to bolster students' self-esteem.

The results of this comprehensive analysis offer profound insights into the optimal conditions under which game-

based listening activities can be most advantageous for vocational students who are often left behind in traditional educational settings. The study reveals a synergistic relationship between the enhancement of self-esteem and the effectiveness of the intervention, underscoring the immense potential of customized educational approaches that thoughtfully integrate both cognitive and affective dimensions in the language learning process. These findings strongly indicate that by incorporating strategies aimed at bolstering self-esteem in conjunction with engaging game-based activities, we can significantly optimize learning outcomes for this particularly vulnerable group of students.

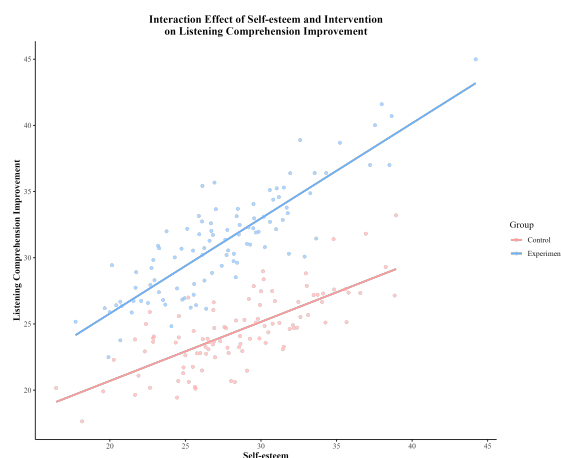


Figure 4. Interaction effect of self-esteem and intervention on listening comprehension improvement.

3.4. Influence of Environmental Factors

The analysis of environmental factors revealed significant influences on the effectiveness of game-based listening activities for left-behind vocational students. A multiple regression analysis was executed to scrutinize the influence of diverse environmental variables on the enhancement of listening comprehension proficiencies. As illustrated in **Table 5**, the results highlight the complex interplay of factors affecting student outcomes.

The findings of our study reveal that the availability of technological resources and the level of support provided by educational institutions are the most powerful indicators of progress in enhancing students' listening comprehension abilities. It is intriguing to note that the length of time during which students experience parental absence appears to correlate with a decrease in their listening comprehension development, highlighting the unique difficulties encountered by those who are left behind. Furthermore, the quality of peer relationships and the extent of involvement in community activities have also been identified as influential factors in this area. In contrast, socioeconomic status does not appear to exert a statistically meaningful influence within the parameters of our model. **Figure 5** illustrates these relationships through a coefficient plot, providing a clear visualization of the relative importance and direction of influence for each environmental factor on listening comprehension improvement. The standardized coefficients and their corresponding confidence intervals demonstrate the differential impact of various environmental factors on student outcomes.

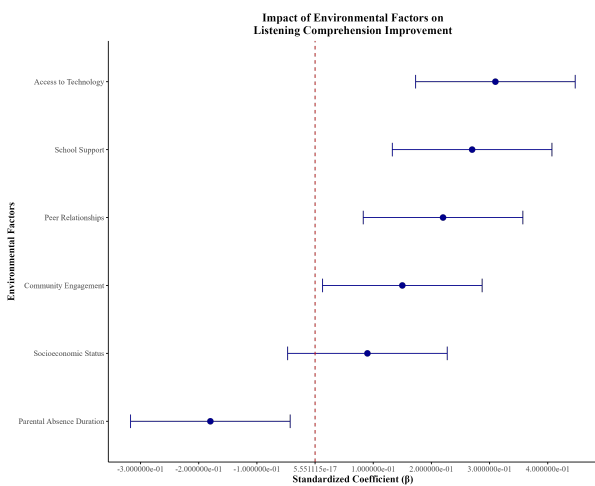


Figure 5. Impact of environmental factors on listening comprehension improvement.

The horizontal axis shows the standardized coefficients, with error bars indicating the 95% confidence intervals. Factors to the right of the dashed red line (representing zero) have a positive influence, while those to the left have a negative influence. The visual representation of data succinctly elucidates the profound and positive influence exerted by the accessibility of technological resources and the supportive infrastructure provided by educational institutions, succeeded by the salutary effects of peer interactions and community involvement. Conversely, the deleterious impact of prolonged parental absence is also conspicuously manifest. This thoroughgoing examination of the environmental determinants furnishes invaluable insights that are indispensable for the formulation of comprehensive intervention strategies. Such strategies are intended to not only tackle the immediate learning milieu but also to encompass the broader social and technological contexts within which left-behind vocational students are situated. The empirical evidence presented herein intimates that initiatives aimed at improving technological access, bolstering the efficacy of school support systems, and alleviating the repercussions of parental absence could markedly enhance the efficacy of game-based pedagogical methodologies for this particularly vulnerable demographic of students.

3.5. Summary of Hypothesis Testing Results

The hypothesis testing results provide compelling evidence for the effectiveness of game-based listening activities in enhancing the English learning motivation and listening comprehension skills of left-behind vocational students. A series of statistical analyses were conducted to test the primary hypotheses of this study. The results, summarized in **Table 6**, indicate significant support for the majority of our hypotheses, with varying effect sizes across different outcome measures.

As demonstrated in **Figure 6**, the forest plot provides a comprehensive visualization of effect sizes and their 95% confidence intervals for different outcome measures, where the horizontal axis represents the magnitude of the effect size (Cohen's d), with larger values indicating stronger effects. This visual representation clearly illustrates the relative strength of the intervention's impact across various aspects of student performance, with listening comprehension and intrinsic motivation showing particularly robust effects.

Table 5. Multiple regression analysis of environmental factors on listening comprehension improvement.

Environmental Factor	Standardized β	t-Value	p-Value	95% CI
Parental Absence Duration	-0.18	-2.45	0.015	[-0.32, -0.04]
School Support	0.27	3.68	<0.001	[0.13, 0.41]
Peer Relationships	0.22	3.01	0.003	[0.08, 0.36]
Access to Technology	0.31	4.22	<0.001	[0.17, 0.45]
Community Engagement	0.15	2.08	0.039	[0.01, 0.29]
Socioeconomic Status	0.09	1.24	0.216	[-0.05, 0.23]

Table 6. Summary of hypothesis testing results.

Hypothesis	Test Statistic	p-value	Effect Size	Outcome
H1: Game-based activities increase motivation	t(98) = 5.83	<0.001	d = 0.79	Supported
H2: Self-esteem moderates intervention effect	F(1,196) = 11.45	0.001	$\eta^2 = 0.055$	Supported
H3: Listening comprehension improves	t(98) = 7.21	<0.001	d = 0.92	Supported
H4: Environmental factors influence outcomes	F(6,191) = 8.76	<0.001	R ² = 0.216	Partially Supported
H5: Intrinsic motivation increases more than extrinsic	t(98) = 3.42	0.001	d = 0.48	Supported

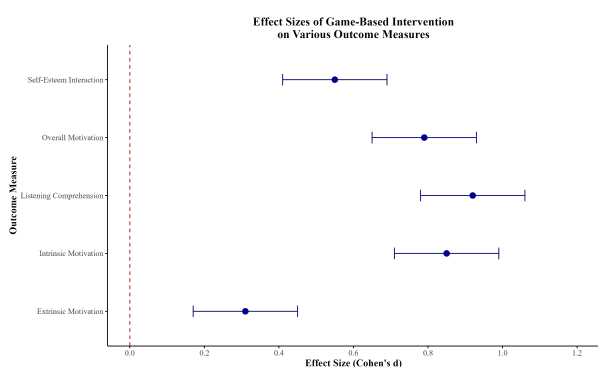


Figure 6. Effect sizes of game-based intervention on various outcome measures.

All effect sizes to the right of the dashed red line (representing zero) indicate positive effects of the intervention. The visualization clearly demonstrates substantial positive effects across all outcome measures, with listening comprehension showing the largest improvement (d = 0.92), followed closely by intrinsic motivation (d = 0.85). The sizeable effect on overall motivation (d = 0.79) underscores the efficacy of game-based activities in enhancing student engagement. The moderate effect size for the self-esteem interaction (d = 0.55) supports the hypothesis that self-esteem plays a significant moderating role in the intervention's effectiveness. Notably, while extrinsic motivation shows the smallest effect size (d = 0.31), it still represents a meaningful improvement. These results collectively provide robust evidence for the multifaceted benefits of game-based listening activities for left-behind vocational students, highlighting its potential as an effective educational strategy for this vulnerable population.

4. Discussion

The findings of this study provide compelling evidence for the efficacy of game-based listening activities in enhancing English learning motivation and listening comprehension skills among left-behind vocational students. All results measured showed substantial positive effects, with listening comprehension showing the greatest improvement, followed by intrinsic motivation. The significant impact on overall motivation highlights the effectiveness of game-based activities in enhancing student engagement. The moderate effect size for the interaction of self-esteem supports the hypothesis that self-esteem plays a significant moderating role in the effectiveness of interventions. Notably, although external motivation showed the smallest effect size, it still represents a meaningful improvement.

The significant improvement in overall motivation, particularly intrinsic motivation, aligns with previous research on the motivational benefits of gamification in educational contexts^[28]. The larger effect size observed for intrinsic motivation compared to extrinsic motivation suggests that game-based activities may be particularly effective in fostering genuine interest and enjoyment in language learning, which is crucial for long-term engagement and success^[29]. The substantial improvement in listening comprehension skills demonstrates the potential of game-based approaches to address specific language learning challenges faced by left-behind vocational students. This finding corroborates earlier studies on the effectiveness of game-based language

learning^[30], while extending these insights to a vulnerable student population. The observed interaction between self-esteem and the intervention's effectiveness highlights the importance of considering individual psychological factors in educational interventions. This interaction suggests that game-based activities may be particularly beneficial for students with higher self-esteem, possibly due to their increased willingness to engage with challenging tasks and persist in the face of difficulties^[31]. The analysis of environmental factors revealed the complex interplay of variables influencing the success of educational interventions for left-behind students. The strong positive impact of access to technology and school support underscores the need for comprehensive approaches that address both technological infrastructure and institutional support systems. The inverse correlation between the duration of parental absence and the enhancement of listening skills underscores the enduring obstacles confronted by students who are left behind and underscores the potential necessity for tailored interventions aimed at alleviating these adverse impacts. The pivotal role of peer relationships and community involvement in shaping learning outcomes resonates with sociocultural theories of language development and underscores the imperative of fostering supportive educational communities. Intriguingly, the absence of a significant direct influence of socioeconomic status on improvement suggests that well-crafted game-based interventions may possess the potential to ameliorate certain educational inequities associated with economic adversity. In general, the left-behind vocational students need special intervention in English learning, and game-based listening activities is an effective method.

The collective findings of this research contribute significantly to a more nuanced and detailed understanding of how game-based learning approaches can be effectively implemented to benefit left-behind vocational students. The study not only showcases the overall effectiveness of the intervention but also sheds light on the various factors that can moderate or influence its impact. This comprehensive analysis provides valuable insights and in-depth understanding for educators, policymakers, and stakeholders who are interested in developing targeted, evidence-based strategies to support this particularly vulnerable student population. By delving deeper into the intricacies of game-based learning, the study highlights the importance of considering the

unique circumstances and challenges faced by left-behind vocational students. Future research could further explore the long-term effects of such interventions, examining how they evolve and sustain their impact over time. Additionally, future studies could investigate potential adaptations to the intervention strategies to better address the specific needs of students with lower self-esteem or those facing more severe environmental and socio-economic challenges. It also suggests some feasible directions for the work of the school, the government and the community where the students live. For example, increase more activities to enhance students' self-esteem, strengthen students' core, and increase more interactive activities in community activities to expand students' horizons. This would ensure that the interventions are not only effective in the short term but also have a lasting, positive influence on the educational outcomes and overall well-being of these students.

5. Conclusions

This investigation has elucidated the considerable potential of game-based listening activities in augmenting English language acquisition among the cohort of Chinese vocational students who are geographically separated from their families. The intervention has exhibited substantial positive impacts on both the motivation to learn and the enhancement of listening comprehension abilities, with notably robust improvements in intrinsic motivation. The research underscores the intricate interplay of psychological and environmental determinants that influence the efficacy of such interventions, including the moderating influence of self-esteem and the impact of diverse environmental variables such as technological access and school support.

The findings accentuate the significance of comprehensive educational approaches that take into account not merely pedagogical methodologies but also the broader social and psychological milieu of learners. For the demographic of vocational students who are geographically isolated from their families and face unique challenges, game-based learning methodologies present a promising pathway for engagement and skill enhancement. Nevertheless, the study also indicates the necessity for supportive environments and individualized considerations to optimize the benefits of such interventions.

These insights offer invaluable guidance for educators,

policymakers, and researchers in shaping and executing effective educational strategies tailored to the needs of vulnerable student populations. Future research endeavors should concentrate on the long-term efficacy of interventions, their scalability, and methodologies to cater to the varying needs of students with different levels of self-esteem and environmental support.

Author Contributions

Conceptualization, J.Y. and R.A.; methodology, R.A.; software, J.Y.; validation, J.Y. and R.A.; formal analysis, J.Y.; data curation, J.Y.; writing original draft preparation, J.Y.; writing, review and editing, R.A.; project administration, R.A.. All authors have read and agreed to the published version of the manuscript.

Funding

This work received no external funding.

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

Information about data and materials used in the study is available.

Conflicts of Interest

The authors declare no conflict of interest.

References

- [1] Adipat, S., Laksana, K., Busayanon, K., et al., 2021. Engaging students in the learning process with game-based learning: The fundamental concepts. *International Journal of Technology in Education (IJTE)*. 4(3), 542–552. DOI: <https://doi.org/10.46328/ijte.169>
- [2] Alhebshi, A.A., Halabi, S.M., 2020. Teachers' and learners' perceptions towards game-based learning in ESL classroom. *Journal for the Study of English Linguistics*. 8(1), 166. DOI: <https://doi.org/10.5296/jsel.v8i1.17353>
- [3] Dicheva, D., Dichev, C., Agre, G., et al., 2015. Gamification in education: A systematic mapping study. *Educational Technology & Society*. 18(3), 75–88. Available from: <http://www.jstor.org/stable/jeductechsoci.18.3.75> (cited 7 December 2023).
- [4] Bai, S., Hew, K.F., Huang, B., 2020. Does gamification improve student learning outcomes? Evidence from a meta-analysis and synthesis of qualitative data in educational contexts. *Educational Research Review*. 30(1), 30–34. DOI: <https://doi.org/10.1016/j.edurev.2020.100322>
- [5] Yang, J.C., Lin, M.Y.D., Chen, S.Y., 2018. Effects of anxiety levels on learning performance and gaming performance in game-based learning. *Journal of Computer Assisted Learning*. 34(3), 324–334. DOI: <https://doi.org/10.1111/jcal.12245>
- [6] García Bacete, F.J., Doménech Betoret, F., 1997. Motivación, aprendizaje y rendimiento escolar. *REME*. 0, 1. Available from: <http://reme.uji.es/articulos/pa0001/texto.html> (cited 7 December 2023).
- [7] Yang, J.C., Quadir, B., Chen, N.S., 2016. Effects of the badge mechanism on self-efficacy and learning performance in a game-based English learning environment. *Journal of Educational Computing Research*. 54(3), 371–394.
- [8] Hernández, D., Espinoza Caro, J.J., 2014. Factores que inciden en el aprendizaje del idioma inglés en los alumnos de segundo año medio de la ciudad de Chillán. Available from: <http://repobib.ubiobio.cl/jspui/handle/123456789/1143> (cited 7 December 2023).
- [9] Pinter, R., Čisar, S.M., Balogh, Z., et al., 2020. Enhancing higher education student class attendance through gamification. *Acta Polytechnica Hungarica*. 17(2), 13–33. DOI: <https://doi.org/10.12700/aph.17.2.2020.2.2>
- [10] Schaaf, R., Mohan, N., 2016. *Game on: Using digital games for 21st-century teaching, learning, and assessment*. Bloomington: Solution Tree Press. pp. 127–156.
- [11] Kralovec, E., Buell, J., 2000. *The end of homework: How homework disrupts families, overburdens children, and limits learning*. Boston: Beacon Press. pp. 39–72.
- [12] Kyriacou, C., 2000. *Stress-busting for teachers*. Cheltenham: Nelson Thornes. pp. 85–124.
- [13] Latorre, Á., Teruel Romero, J., 2009. Protocolo de actuación ante conductas disruptivas. *Praxis*. 95(3), 62–74.
- [14] Martòri, M.S., 2013. *Educación y clases sociales: Los efectos de la democracia*. Cuadernos de pedagogía, 431(2), 74–77.
- [15] Maslach, C., 1993. *Burnout: A multidimensional perspective*. In: W. B. Schaufeli, C. Maslach & T. Marek

- (Eds.). Professional burnout: Recent developments in theory and research (pp. 19–32). Taylor and Francis.
- [16] Olías Ferrera, F., (n.d.). Estrategias para la mejora de la gestión de aula [PDF file].
- [17] Ortiz, J., 2009. La disrupción. Causa de la violencia en el aula. *Temas para la Educación*. (4), 1–6.
- [18] Paz Rodríguez, J., 2013. Valores educativos para el mundo de hoy de la pedagogía de Robindronath Tagore. *Padres Y Maestros/Journal of Parents and Teachers*. 31(353), 26–30. Available from: <https://revistas.comillas.edu/index.php/padresymaestros/article/view/1704> (cited 7 December 2023).
- [19] Penalva, A., Hernández, M.A., Guerrero, C., 2013. La gestión eficaz del docente en el aula. Un estudio de caso. *Revista Electrónica Interuniversitaria de Formación del Profesorado*. 2(3), 77–91. DOI: <http://dx.doi.org/10.6018/reifop.16.2.180931>
- [20] Pineda, D., Frodden, C., 2008. The development of a novice teacher’s autonomy in the context of EFL in Colombia. *PROFILE, Issues in Teachers’ Professional Development*. 9(1), 143–162.
- [21] Ricou, J., 2019. Cinco segundos de atención: La búsqueda de estímulos continuos afecta a las habilidades de concentración. *La Vanguardia*, p. 1. Available from: <https://www.lavanguardia.com/vida/20190203/46177449169/capacidad-atencion-estimulos-concentracion.html> (cited 7 December 2023).
- [22] Sharma, B., 2006. *ELT classroom management: Problems with students’ discipline*. Young Voices in ELT. 5(2), 34–37.
- [23] Shrestha, R., 2010. A study on disruptive behaviour of students in English language classrooms [Doctoral Thesis]. Kathmandu: Tribhuvan University. pp. 145–167.
- [24] Skinner, B.F., 1974. *About behaviourism*. New York: Knopf. pp. 208–234.
- [25] Solé, M.M., 1982. Don Lorenzo Milani y el nacimiento de la escuela Barbiana. *Cuadernos de pedagogía*. (89), 4–6.
- [26] Soo, C., Lee, J., 2022. The psychology of rewards in game-based learning: A comprehensive review. *Journal of Cognitive Sciences and Human Development*. 8(2), 68–88. DOI: <https://doi.org/10.33736/jcshd.4131.2022>
- [27] Spitz, M., 2011. The gamification of healthcare and what it means for mobile. Available from: <http://www.pharmaphorum.com/2011/12/09/mhealth-monthly-mashup-release-6-0-the-gamification-of-healthcare-and-what-it-means-for-mobile/> (cited 15 December 2023).
- [28] Tedesco, J.C., 2011. ¿De qué dependen los resultados escolares? *Cuadernos de Pedagogía*. 416(3), 92–95.
- [29] Tribó, G. 2008. El nuevo perfil profesional de los profesores de secundaria. *Educación XXI*. 11(1), 183–209.
- [30] Vaello Orts, J., 2005. *Las habilidades sociales en el aula*. Madrid: Santillana. pp. 86–112.
- [31] Vaello Orts, J., 2007. *Como dar clase a los que no quieren*. Madrid: Santillana. pp. 156–189.