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Enhancing Vocabulary Acquisition in Pakistani ESL Learners through Video Games: An Experimental Study

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ABSTRACT

This study explores video games' effectiveness for vocabulary acquisition among Pakistani ESL learners versus traditional methods, aligning with UN SDG 4: Quality Education to promote innovative, inclusive learning. A quasi-experimental design was utilized, involving second-semester undergraduate students who were divided into control and experimental groups. A pre-test was administered to assess participants' baseline vocabulary knowledge, followed by a post-test after a two-week intervention. During this period, the control group was taught vocabulary using traditional methods, while the experimental group engaged with the immersive video game Atlantis Odyssey: Adventure. The experimental group showed significant improvement in the vocabulary scores, with a large effect size, suggesting that video games can effectively enhance vocabulary retention and student engagement. Additionally, qualitative data gathered through semi-structured interviews highlighted themes such as immersive engagement, contextual learning, and the potential benefits of combining gaming with traditional instructional methods. The participants reported that the acquisition of natural language was enhanced, and their confidence in using new vocabulary was stronger because of the enjoyable nature of video games. These judgments suggest that gamified learning strategies may offer an effective and engaging alternative to traditional vocabulary instruction in ESL education. The long-term effects of learning through video games should be

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examined as future research, and if so, whether the language skills learned this way can be generalized to other language domains.

Keywords: Quality Education; Vocabulary Acquisition; Contextual Learning; Gamified Learning Strategies; English as Second Language; Effectiveness

1. Introduction

In the modern era of technology, traditional methods of learning and teaching are being abandoned, and modern technology is taking over. Video games are part of this modern-day technological advancement. According to Baltezarević et al.[1], the gaming industry generated 18 million USD in 2018 with an expected annual increase of 5.6% and a market volume of 18 million USD by 2022. This industry has been growing day by day. These games are being played by many students in different scenarios and have a powerful impact on their learning. Many studies have concluded that video games have a significant effect on students' acquisition by providing an immense interactive environment[2–4]. The usage of video games for L2 learning has been studied in many different ways. Sitdikova found out that the improvement of foreign language proficiency can benefit from playing particular types of computer games[5].

It has been demonstrated that playing video games helps students interactively acquire vocabulary words. Arnold-Stein and Hortobagyi investigated that video games' immersive characteristics make it possible to learn language both implicitly and explicitly[6], which facilitates vocabulary expansion. Vocabulary learned without any intention, in contextualized methods stay in mind for a longer time. Playing video games can lead to unintentional vocabulary acquisition, in which users pick up novel words from the game and apply them to real-world scenarios. Asari investigated and found that playing video games can result in unintentional vocabulary acquisition[7], in which users pick up novel words from the game and apply them to real-world scenarios. Furthermore, the study of Charlebois found that multimodal features for vocabulary learning are provided by video games[8], which combine visual, textual, and procedural modes to facilitate spoken discourse and improve vocabulary acquisition.

In education, vocabulary learning through games is very important, as it enables students to use English more flexibly and communicatively and provides real world context inside the classroom. However, it is mandatory to accurately choose a game that provides an interactive way of learning and catchy graphics that keep the students engaged and help them learn the vocabulary with entertainment. This paper investigates the potential usefulness of a particular video in the improvement of the vocabulary of students by providing them with an engaging interface.

2. Literature Review

2.1. Vocabulary in ESL learning

A language is the mode of communication for people through which they share their thoughts, feelings, and information. English is a widely used language and is spoken in almost 86 countries, with almost 2 billion people in the world. Vocabulary is the total number of words used by a language, group, person, particular work, or a body of knowledge in a certain field.

Vocabulary has been a neglected element of language learning for over 50 years, as is argued by Alqahtani[9]. Lack of interest in vocabulary learning leads to hurdles in the effective learning of foreign languages. Learning vocabulary has never been so easy at any level of education because it involves more than just memorizing the words and their meanings. Vocabulary must be taught in context so that students can easily learn and understand it. Pakistan is a multilingual country where more than 86 languages are spoken, and English is a co-official language. English is used in educational institutions as the medium of instruction, and many students face problems while learning English to fulfil their academic requirements. They face numerous problems in learning grammar, pronunciation, and vocabulary. Vocabulary learning is considered very challenging for Pakistani ESL learners. It is not taught as a subject in institutes, and no particular attention is given to vocabulary teaching. Pakistani ESL learners learn vocabulary through traditional methods

as they learn vocabulary passively with the help of explanations of their teachers, when scholars ask the teacher to define various unfamiliar terms that they come across in a text and then to explain how to use them.

According to Harmer[10], memorizing the word list is one of the more frequent methods for learners to develop vocabulary. This method has a few benefits, but it cannot ensure that students completely comprehend the terms. In contrast, decontextualized methods are considered more beneficial compared to traditional methods of learning vocabulary as it is the process of learning vocabulary through its use in context. According to the findings of Fengyu[11], conventional techniques such as flashcards and rote memorization provide a basis for vocabulary knowledge but fail to promote its complete application in different situations. Conversely, learning in context, methods assisted by technological aids and multimodal resources utilization enable vocabulary application via the presentation of realistic situations, interesting activities, and a complete learning environment.

Recent research on Pakistani ESL learners has examined pragmatic competence in communication, such as politeness strategies in disagreement[12]. Building on such sociolinguistic insights, this study investigates how interactive methods, like video games, can enhance vocabulary acquisition in a similar learner demographic.

Watching English cartoons significantly influences preschoolers in Dhaka City, enhancing their English language skills, particularly in vocabulary and comprehension, while also raising concerns about exposure to violent content, and its behavioral implications[13].

2.2. Learning Vocabulary Through Games

Language learning through digital platforms is becoming more common, and students are taking more interest in digital learning instead of sitting in the classroom and learning and practicing language through traditional methods.

Traditional methods are not effective in vocabulary learning, as these methods do not have the application of vocabulary in real-life contexts. The old-school method of learning and teaching vocabulary has become much more boring for most students. According to Nation and Chung[14], teaching and learning vocabulary with the decontextualized method is a waste of time and effort, as most of the students forget the learned words if they don't use them in context

without practicing them. Vocabulary that is being learned and practiced in context remains in memory for a long time. So, for this purpose, innovative methods are used for learning and teaching vocabulary. The use of digital learning is changing education in really new and different ways. With the emergence of the internet and other digital sources, learning has become a much more advanced and feasible activity. In his seminal work, Levy discussed Computer Assisted Language Learning (CALL) as "the study and application of computer programs for language teaching and learning"[15], which is used nowadays in acquiring and imparting the knowledge of a language.

With the emergence of modern technologies, digital learning is developing rapidly. Digital Gaming-Based Language Learning (DGBLL) is emerging in the technology language learning field. In a Bayesian meta-analysis of 19 studies, the study indicated that integration of engaging video games into educational contexts can result in notable student learning gains and that video-game-based learning can have a notable impact on English language learning. The application of DGBLL to assist learners of English as a foreign language (EFL) and as a second language (ESL) is an innovative approach to investigating how educational technology could promote language learning.

Afzal found that in Saudi Arabia, English majors at Prince Sattam bin Abdulaziz University struggle with several different vocabulary problems[16], including remembering and accurately spelling new words, pronouncing them correctly, and understanding their meanings. This study contributes by highlighting the value of acquiring the English language vocabulary, bringing it to students' attention, highlighting the issues they face, and increasing vocabulary awareness.

With the emergence of CALL, students also started learning L2 vocabulary through digital sources. According to Donmus[17], people play video games for a long period simply as a strategy to escape from the boredom of their everyday lives. Since the introduction of computers into our lives, games on computers and later the internet have become increasingly popular as a way to make our lives more thrilling and engaging. In his study, Baierschmidt finds that there is a growing interest in the use of games in education, especially for language learning[18]. The information gathered demonstrates that students participated fully in the lesson

and believed it was beneficial for their English studies.

Vocabulary learning is one of the skills that is learned through video games by ESL learners. In most cases, vocabulary is taught out of context, and students forget it after some time. However, video games provide an interactive and repetitive environment to practice and recall the learned vocabulary as learners play the games again and again. Playing games has an effective impact on the vocabulary of ESL learners, as Engqvist found that there is a correlation between English vocabulary proficiency and video games [19], and before this study, Sylvén and Sundqvist also found this correlation [20]. Al-Sofi conducted research among non-majoring Saudi students to find out that game-based learning (GBL) activities are effective in enhancing L2 vocabulary acquisition through engaging tasks like crossword puzzles and matching exercises from textbooks [21]. The study highlights improvements in students' vocabulary exam scores and positive perceptions of GBL, fostering a motivating classroom environment. It also establishes a link between academic success and vocabulary acquisition, emphasizing GBL's role in meeting learning goals. Using a mixed-methods approach, the research concludes that GBL significantly improves vocabulary acquisition, student engagement, and performance.

The purpose of this current study is to determine whether video games can be an effective tool in learning vocabulary in place of traditional learning tools in a Pakistani context. By examining the potential advantages of interactive and immersive gaming environments, this research seeks to determine whether video games offer measurable improvements in vocabulary retention and learner engagement, thereby contributing to a deeper understanding of innovative approaches to language learning.

3. Research Methodology

3.1. Research Design

The current study intends to investigate the effectiveness of incorporating video games into vocabulary learning in classroom settings while also obtaining insightful input and recommendations from students. The study uses a quasi-experimental design and a mixed-methods approach to ascertain whether, and in what way, vocabulary acquisition is affected by video game play by investigating the causal relationship between video games and learners' vocab-

ulary skills and precise feedback from participants (**Figure 1**) [22, 23]. Classroom participants are first assessed with a pre-test, and then they are grouped and randomly assigned into control and experimental groups.
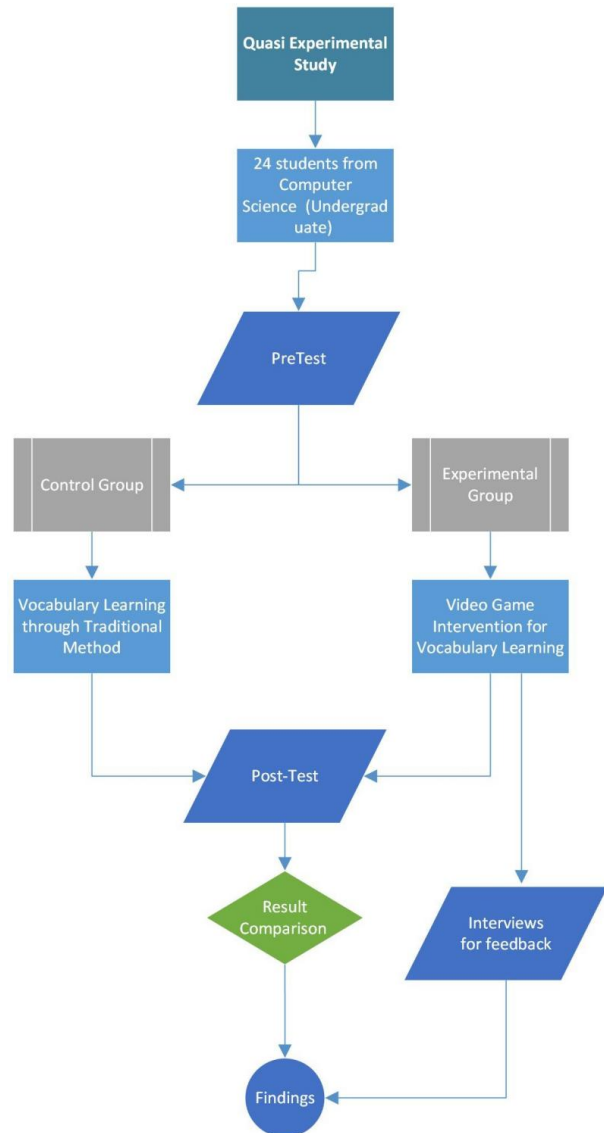

Figure 1. Research Design.

3.2. Participants

The participants in this study comprise second-semester undergraduate BSCS students enrolled at the University of Central Punjab, Lahore. These students are enrolled in session 2023–27 and undergoing instruction in an English II course as a minor subject, aimed at refining their communication skills at an advanced level. The study sample encompasses 24 students of diverse gender identities, with ages

ranging between 17 and 20 years. Through random assignments, participants are allocated into either the control or experimental group.

3.3. Variables

This study attempts to explore how video games influence vocabulary acquisition in ESL learners by determining and making operational relevant variables. The video game intervention is the independent variable that is being examined. This variable includes using video games as tools for instruction to help ESL students learn language. Video games can be categorized into educational or entertainment genres. The specific game mechanics, level of interactivity, and duration of gameplay are also important factors to consider.

The dependent variable is vocabulary acquisition in the study, which measures the effectiveness of the video game intervention in enhancing ESL learners' vocabulary knowledge. This variable is assessed through pre- and post-vocabulary tests, used to determine the proficiency levels of the subjects, both before and after they engage with the video game intervention.

3.4. Tools

A varied set of instruments is used in the study to examine the usefulness of blending video games into undergraduate students' vocabulary learning. Assessments such as pre-tests and post-tests are used to determine initial vocabulary expertise and track further development. A questionnaire is also used to get feedback and suggestions from participants about their experiences with the methodology used. In-depth semi-interviews are also carried out to extract intricate information and investigate participants' opinions and recommendations for improving the teaching methodology. All tools were validated by the experts.

3.4.1. Pre-Test

During the early stage of the research, each participant was given a proficiency pre-test to gauge their baseline vocabulary knowledge. The test was developed from the vocabulary extracted from the game and consisted of approximately more than 70 words. These game-specified words were novel for undergraduate level students due to low

frequency. With ten multiple-choice questions covering synonyms and antonyms and five matching-answer questions, the exam provided a thorough assessment of participants' lexical knowledge. The level of difficulty of the test was basic, especially for undergraduate-level students. The test was discussed with the English language teacher and then brought in its final state. The researcher observed the test for a period of 20 minutes.

3.4.2. Intervention of Game Teaching

After completing the pre-test phase, the participants assigned to the experimental group were given a briefing about the game. They received basic instructions on how to play the game and were familiar with the game's user interface. The subjects for the study were then asked to play the game for one hour daily for two weeks. As the assignment progressed, participants were gradually given more instructions. They continued to play the game for one hour daily for two weeks.

The control group was given self-learning tasks to learn vocabulary using the traditional pen-and-paper method for a period of two weeks.

3.4.3. Atlantis Odyssey: Adventure

Atlantis Odyssey: Adventure is a thrilling adventure video available on multiple platforms that takes the players on the adventurous journey of the island. This game provides an interactive user interface and graphics to catch their attention for a long while, and players play the game for hours to solve the puzzles and mysteries and discover the secrets of ancient civilization on the island. This game was released by VIZOR APPS LTD in 2020. This game has more than 5 million downloads with a 4.3 star rating on the Google Play Store.

3.4.4. The Story

In Atlantis Odyssey, players assume the role of a young adventurer captivated by the legendof Atlantis, the fabled city believed to have vanished beneath the ocean's depths millennia ago. Motivated by an insatiable curiosity to unravel the enigma surrounding this ancient city, the protagonist embarks on a quest to locate Atlantis and unveil its secrets.

Throughout the journey, the adventurer encounters a diverse array of puzzles and challenges, each demanding a strategic solution. From navigating treacherous traps to

overcoming obstacles and hazards, the path to Atlantis is fraught with peril (**Figure 2**). Fortunately, the protagonist is equipped with a repertoire of tools and gadgets, including a reliable compass guiding the way to the destination, a versatile grappling hook facilitating traversal across gaps and walls, and an assortment of other tools essential for navigating the hazardous terrain. The player must utilize these resources wisely to navigate the mysterious and dangerous journey in search of Atlantis. The purpose of selecting this game for the study was that it is an interactive and engaging game for young players (**Figure 3**). The characters of the game communicate with each other, and their conversation is written on the lower side of the screen. These phenomena force the players to read the whole talk and to understand it to solve the mission or puzzle. This game includes several novel words that are unfamiliar to most learners. In this way, the player learns the new vocabulary words from the game in context.

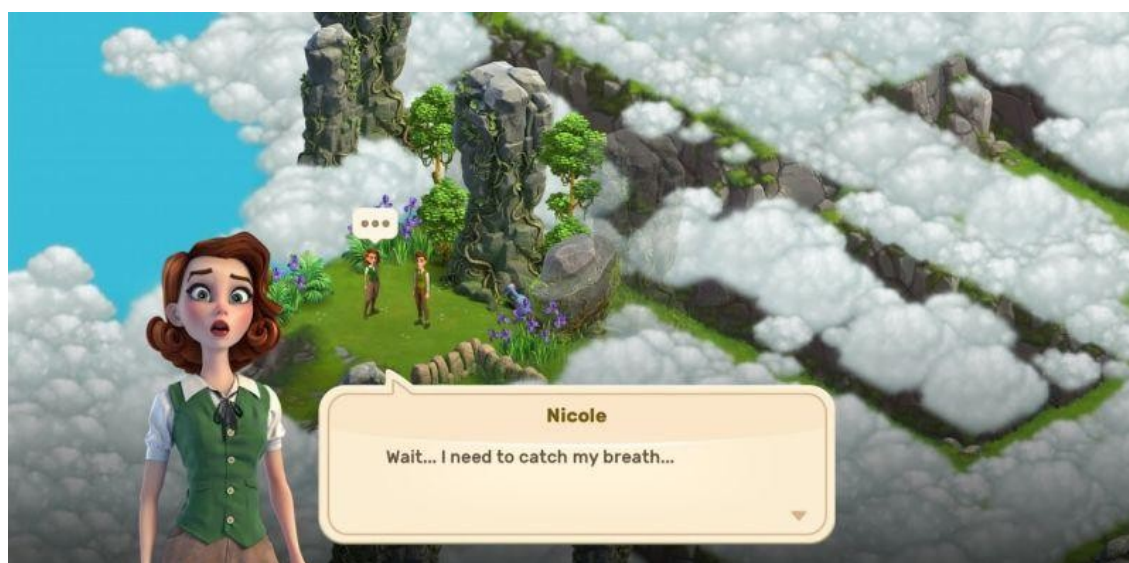**Figure 2.** Gameplay Interface of Atlantis Odyssey: Adventure.

Figure 3. Game Character Interacting (Shown in Subtitle).

3.4.5. Post-Test

An achievement post-test was created by the researcher using a similar pattern as the pre-test, with no repeated questions. The post-test was conducted in 30 minutes, similar to the pre-test.

3.4.6. Post-Test

Ten semi-structured interviews were conducted, each lasting 15–20 minutes. A total of 5–7 questions were asked during the interview from a total of 5 participants. The interviews were audio-recorded, transcribed word for word, and made anonymous to protect confidentiality. The transcribed data was then imported into NVivo for analysis. Using an inductive approach, the transcripts were carefully analyzed line by line, and open coding was applied to identify key concepts and patterns. After coding, the data was grouped into broader themes, and each theme was analyzed in detail to understand its significance.

4. Data Analysis

IBM Statistical Package for the Social Sciences (SPSS) version 26 was utilized for the analysis of the data collected from the pre-test and post-test. The different scores acquired from both control and experimental groups were compared using an independent sample t-test. For the interview data, NVIVO 14 was utilized to conduct a thematic analysis of the descriptive data to identify relevant themes.

4.1. Pre-Test Analysis

Pre-test results indicate that the mean scores of the control group, 5.50 (SD=3.06), are slightly higher than the mean score of the experimental group, 5.83 (SD = 2.79). Statistical significance of difference between two groups is assessed by a t-test resulting in a t-value of 0.279. The 95% confidence interval (CI) for mean difference did not indicate a statistically significant difference between the groups (from −2.81 to 2.14). Moreover, since the effect size for two groups is measured using Cohn's d, it is 0.11, which means that there is a negligible difference between the two groups. We find that, prior to the intervention, the control and experimental groups are similar in terms of initial performance, thus offering a defensible foundation from which to gauge the effect of treatment on posttest outcome.

4.2. Post-Test Analysis

Upon completing the intervention, a post-test was conducted in order to assess the learning level of the participants. To ensure uniformity and provide a clear comparison of pre- and post-intervention results, the same evaluation instruments utilized in the pre-test phase were employed for the post-test. The data was analyzed using the same method that was utilized for pre-test analysis (**Table 1**).

Table 1. Statistics of Post-Test Analysis.

	Control		Experimental		95% CI			
Variables	M	SD	M	SD	T	LL	UL	**Cohn's d**
Scores	6.25	1.13	8.16	1.02	4.32	0.99	2.83	**1.76**

Post-test results indicate that the mean score and standard deviation (SD) for the control group are 6.25 (SD = 1.13) and 8.16 (SD = 1.02) for the experimental group. For statistical difference of the two groups, this leads to a t-value equal to 4.32. A statistically significant difference in favor of the experimental group is indicated by the 95% confidence interval (CI) for the difference in the intervention mean ranging from 0.99 to 2.83. Moreover, the effect size is 1.76 size of a large effect, according to Cohen's d. As such, these findings indicate the intervention that was used for the experimental group is very effective in improving performance above that of the control group.

4.3. Groups Score Comparison

Pre- and post-test scores for both the control and experimental groups show different trends. According to scores in the pre-test (**Table 2**), the control group had a mean of 5.50 (SD = 3.06), which was slightly higher in the post-test; the mean was 6.25 (SD = 1.13), suggesting little improvement. On the other hand, the experimental group starts with a mean score of 5.83 (SD = 2.79) in the pre-test and this figure

increases markedly to 8.16 (SD = 1.02) in the post-test. Analyses with the pre-test using the t-test reveal no significant group difference between the groups (t = −0.279, 95% CI [−2.81, 2.14], Cohn's d = 0.11), indicating their similarity at baseline. The post-test analysis finds statistical significance in the difference of scores between the control and the experimental groups (t = 4.32, 95% CI [0.99, 2.83], Cohn's d = 1.76), but the effect size is considerable. Based on these results, we observe that while the control group improves slightly, the experimental group improves much more substantially, from which we conclude that the intervention is indeed effective.

Table 2. Statistics of Pre-Test Analysis.

	Control		Experimental		95% CI			
Variables	M	SD	M	SD	T	LL	UL	**Cohn's d**
Scores	5.50	3.06	5.83	2.79	−0.279	−2.81	2.14	**0.11**

4.4. Interviews

A thematic analysis was conducted on the five interviews to explore participants' perceptions and experiences with the utilization of video games for vocabulary acquisition (**Figure 4**). The analysis follows the Recursive Thematic Analysis (RTA) method, examining recurring patterns across responses to identify themes that illustrate key insights into the effectiveness of video games as a learning tool.
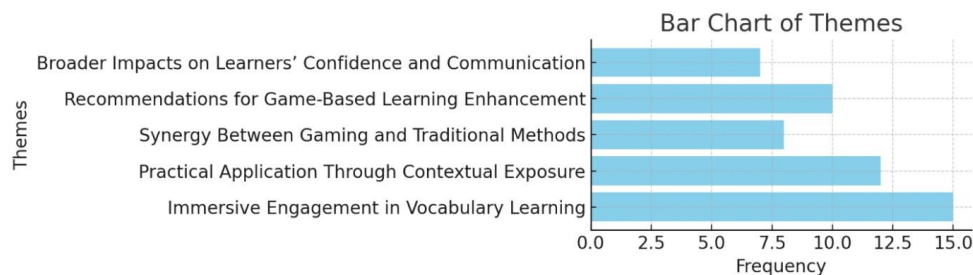

Figure 4. Bar Chart Showing the Frequency of Themes.

4.4.1. Theme 1: Immersive Engagement in Vocabulary Learning

All participants repeatedly underscored the immersive and captivating aspect of video games as a vocabulary learning method. This theme reflects the ability of video games to create captivating environments that facilitate natural language acquisition. Respondent 1 highlighted the immersive nature of the intervention, stating, "The games I played were rich in narrative, dialogue, and problem-solving tasks that required me to understand and use new vocabulary." Similarly, Respondent 3 described their experience as "fascinating" and "educational," emphasizing the way diverse narratives broadened their perspective and improved their communication skills.

Engagement through storylines and interactive tasks emerged as a crucial factor. For instance, Respondent 4 noted that games such as *Atlantis Odyssey* demanded attention to dialogues and provided an interactive environment conducive to learning. These immersive experiences contrasted sharply with traditional vocabulary methods, which were often described as "boring" or "forced" (Respondents 1 and 5). This theme underscores the potential of video games to sustain learners' attention and motivate them through enjoyable and contextually rich activities.

4.4.2. Theme 2: Practical Application Through Contextual Exposure

A major advantage of video games identified in the interviews was their ability to provide contextual learning opportunities. This theme captures how participants perceived the integration of vocabulary into gameplay scenarios as a key factor in improving retention and application. Respondent 1 explained, "If I encounter a new word during gameplay, I often need to understand it to progress, which reinforces learning in a practical way." This connection between vocabulary and gameplay not only enhanced retention

but also enabled participants to see the relevance of new words in meaningful contexts.

Respondent 2 echoed this sentiment, noting that subtitles and engaging scenarios helped them "retrieve vocabulary" and "memorize spellings." Additionally, Respondent 5 highlighted the benefit of encountering words in dialogues and quests, describing the process as "feeling more like an adventure than a traditional learning activity." This theme highlights how video games enable learners to move beyond rote memorization by embedding vocabulary in interactive and memorable experiences.

4.4.3. Theme 3: Synergy Between Gaming and Traditional Methods

Although video games were widely praised for their innovative approach, participants also recognized the value of integrating them with traditional vocabulary learning methods. This theme represents the complementary nature of the two approaches. Respondent 5 suggested that video games work best "when combined with traditional methods for reinforcement." For example, reflective activities such as journaling about words encountered during gameplay or engaging in discussions with peers were proposed by Respondent 1 as effective ways to bridge the gap between gaming and traditional study techniques.

Respondent 4 further suggested incorporating video games into educational curricula, stating, "Teachers should use games in teaching and make it a part of the syllabus to enhance the students' capability of learning the language." These insights demonstrate a recognition of the potential for synergy, where video games serve as a motivating and engaging supplement to more structured vocabulary instruction.

4.4.4. Theme 4: Recommendations for Game-Based Learning Enhancement

Participants provided several suggestions for enhancing the effectiveness of video games as tools for vocabulary acquisition. This theme reflects a desire for more tailored and purposeful game design to maximize educational outcomes. Respondent 5 recommended "adding pop-up definitions or explanations for new words in the game" to help learners understand unfamiliar terms without breaking immersion. Similarly, Respondent 3 proposed integrating "mini-games focused on word usage" and "multiplayer feedback systems" to reinforce learning.

The importance of customizable difficulty levels was highlighted by multiple participants. Respondent 1 suggested that games should allow players to adjust language difficulty to cater to varying proficiency levels, while Respondent 2 encouraged developers to create games rich in interaction and vocabulary. Additionally, Respondent 4 emphasized the need for parental and teacher involvement in introducing these tools to children at an early age, advocating for greater adoption of video games in formal education settings.

4.4.5. Theme 5: Broader Impacts on Learners' Confidence and Communication

The transformative impact of video games on learners' confidence and communication skills emerged as a recurring theme. Respondent 5 noted that their vocabulary skills had "room for improvement" but expressed greater confidence in using a wider range of words, especially in casual conversations. Respondent 4 attributed their increased confidence to the interactive nature of video games, stating, "I also got my confidence in English while listening to their conversation."

Beyond vocabulary, video games were seen as fostering critical skills such as problem-solving, adaptability, and collaboration. Respondent 3 reflected on the broader educational value of gaming, describing it as a "fascinating reflection of human nature and experience." This theme highlights how video games can not only boost language proficiency but also foster comprehensive personal growth.

Five interrelated themes surfaced from the analysis of these interviews, which shed light on the potential video games' utilization for vocabulary acquisition. Participants valued video games for their immersive and engaging nature, the opportunities for contextual exposure, and the ability for the methods to work in concert with traditional methods. Recommendations for enhancement focused on tailored game design and integration into formal education. Finally, the broader impacts on learners' confidence and communication skills underline the transformative potential of this approach. These findings indicate that video games can have a meaningful impact on contemporary language learning, offering an enjoyable and effective alternative to conventional methods.

5. Conclusions

Video games have been shown to be a powerful tool for improving vocabulary acquisition in this research over tradi-

tional methods of learning. Analysis on the control and experimental groups using pre- and post-tests demonstrated that there was no significant difference in the control group before the intervention, while the experimental group improved significantly, and a large effect size showed that using video games for learning vocabulary had a positive effect. The immersive engagement, pragmatic use in contextual exposures, and the affordances of video games together with more traditional methods were also highlighted by interviews with participants. In addition, participants suggested enhancing the game with customizable difficulty levels and designing it for more meaningful learning. Also, video games were also found to increase the confidence as well as communication skills in learners, highlighting their complete advantages. In general, the results from this research support the possibility of video games being used as an engaging and dynamic tool for vocabulary acquisition and language learning.

These results are aligned with prior research emphasizing the effectiveness of interactive learning approaches for language acquisition. For instance, previous works demonstrated that gamified learning environments enhance language skills by fostering engagement and contextual understanding[24, 25]. Similar to the current study, their work highlighted the multimodal nature of video games as pivotal for retention and real-world application of vocabulary. Moreover, findings from DeHaan et al. support the idea that interactivity and repetition in digital contexts improve memory recall and facilitate deep learning, comparable to the effects observed here[26].

The significant gains in the experimental group advocate for broader adoption of interactive, multimedia-based teaching strategies for vocabulary learning. Future investigations could explore the long-term effects of these methods on retention, assess their efficacy across diverse learner profiles, and extend their application to other language acquisition domains, such as grammar or speaking skills, further enriching our understanding of technology-enhanced education.

Author Contributions

The contributions of the authors are as follows: M.H.R. conceptualized the study, developed the methodology and analytical approach, and supervised the research execution and data interpretation. A.T. contributed to the methodology, investigation, formal analysis, and wrote the initial draft. K.A. assisted in refining the methodology, performed data analysis and interpretation, and improved manuscript preparation. R.B. was involved in writing, reviewing, and editing the manuscript, while S.A. focused on review, editing, and formatting. R.S.A. provided additional support in editing, and formatting. All authors have read and approved the final manuscript.

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Institutional Review Board Statement

The ethical review committee/Institutional Review Board approval was not required to collect data. However, the department permission was taken by the researcher.

Informed Consent Statement

Before starting the research process, a written consent form containing details of the study was shared with the students. The study was conducted on those participants who voluntarily agreed with signed consent forms.

Data Availability Statement

There is no corpus of data or data web link created for this study however data is available with the researcher.

Acknowledgments

Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication

of this article.

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