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Learning Vocabulary via Video Games: A Case Study of Saudi University Students

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Abstract
The main aim of the study is to examine the impact of video games on vocabulary acquisition among Saudi university students, as well as what types of games are most effective and students' perceptions of their use. A mixed-methods approach was employed, involving 100 students divided into control and experimental groups. Over twelve weeks, the experimental group used video game-based learning activities, while the control group followed traditional methods. Vocabulary gains were measured using pre-tests and post-tests. Qualitative data from questionnaires and interviews with the participants have supplemented the results. The findings show that the students who used video games reported greater engagement, motivation, and reduced language anxiety, appreciating the contextual learning and immediate feedback provided by video games. These findings support the use of video games as effective tools for vocabulary acquisition, offering an interactive and immersive learning experience. Students' positive perceptions further highlight the benefits of integrating video games into language learning. Future research should investigate the long-term effects of video game-based learning and its influence on other language skills, as well as explore different game types in various educational settings. This study provides valuable insights for educators and policymakers seeking to enhance language education.

***Keywords*:** vocabulary learning, video games, game-based learning, language education
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Introduction

Background

The integration of technology in education has revolutionized the way students learn and acquire new knowledge. An emerging area of interest is the use of video games for educational purposes. Therefore, it is important to consider the impact of such games, the types of games that are most effective, and students' perceptions of games in the language learning environment. Video games, traditionally perceived as mere sources of entertainment, have shown potential in enhancing cognitive and language skills. Therefore, this study explores the efficacy of video games in aiding vocabulary acquisition among Saudi university students, aiming to provide empirical evidence for the educational value of video games. Furthermore, video games provide an interactive and engaging platform catering to various learning styles, making them an attractive alternative to traditional learning methods. The immersive environments and contextualized language used in video games can offer learners practical applications of new vocabulary in real-time scenarios. As digital natives, today's students are increasingly comfortable with technology, and leveraging video games for education can bridge the gap between entertainment and learning, as shown in a systematic review on the use of video games for academic learning by Martinez et al (2022).

Given the increasing globalization and the importance of English as a global lingua franca, innovative methods to improve language proficiency are essential. Furthermore, this study seeks to understand not only the quantitative impact of video games on vocabulary learning but also the qualitative experiences of students engaging with this medium.

Main Aim and Significance

The primary objective of this study is to evaluate the impact of video games on vocabulary acquisition among Saudi university students. Additionally, the study aims to identify students' perceptions and preferences regarding using video games for educational purposes, thereby providing insights into the potential of integrating video games into language learning curricula. This research is particularly significant in Saudi Arabia, where traditional educational methods predominate and there is a growing need for innovative approaches to engaging students in learning. Traditional methods often rely heavily on rote memorization and passive learning, which can lead to disengagement and a lack of practical language skills (Al-Seghayer 2021).

By investigating the role of video games in vocabulary learning, this study aims to contribute to the existing body of knowledge and offer practical implications for educators and policymakers in the region. It highlights the potential for a shift towards more active and experiential learning methodologies that can better prepare students for real-world communication challenges. Additionally, this study addresses the gap in research specifically focused on the Middle Eastern context, providing insights that are culturally and regionally relevant.

Research Questions

The following research questions form the focus of this study:

1. Do video games facilitate vocabulary acquisition among Saudi university students?
2. What types of video games are most effective for vocabulary learning?
3. How do students perceive the use of video games in their language learning process?

The findings of this study could pave the way for curriculum designers to incorporate more engaging and effective learning tools, ultimately enhancing the educational outcomes in the

region. Furthermore, the study seeks to explore the pedagogical frameworks that can best support the integration of video games into language learning, ensuring that such tools are used effectively and sustainably.

Literature Review

Theoretical Framework

The study is grounded in two key theoretical frameworks: Mayer's Cognitive Theory of Multimedia Learning and Krashen's Input Hypothesis. Mayer's theory posits that people learn more effectively when words and images are presented together rather than separately (Mayer 2024). This multimedia learning approach suggests that video games which combine visual and auditory stimuli, can enhance vocabulary acquisition by providing a rich contextual environment. Krashen's Input Hypothesis emphasizes the importance of exposure to comprehensible input in second language acquisition, arguing that language learners acquire new vocabulary when exposed to language slightly above their current proficiency level.

Video games can provide such comprehensible input engagingly and interactively, which can be particularly beneficial for learners who might struggle with traditional learning methods. Mayer (2024) recommends conducting research in natural learning environments, such as the current study, to examine the effectiveness of multimedia learning in relation to its "practical role in improving instruction and training" (Mayer 2024 p.8). In addition, Hartt et al (2020 p.590) explain that students can be motivated as "In the classroom, one important advantage is the ability of games and game-based activities to entice internal learning motivation by introducing various 'joyful' elements." Furthermore, in their research with undergraduate students, they found that "students favored and were more engaged in the game-based lecture" (Hartt et al., 2020 p.589).

Video Games and Language Learning

Video games offer an immersive environment that requires players to follow instructions, solve problems, and interact with characters, all of which can facilitate language practice. Several studies have highlighted the potential of video games in language learning. For instance, Peterson (2016) found that massively multiplayer online role-playing games (MMORPGs) can enhance second language learners' communicative competence by providing opportunities for meaningful interaction in a target language context. Additionally, Reinders and Wattana (2015) demonstrated that digital games could increase learners' motivation and reduce language anxiety, contributing to more effective language learning. These interactive elements make video games an ideal medium for practicing language skills in a low-stress environment.

Vocabulary Acquisition

Vocabulary acquisition is a critical component of language learning, as a rich vocabulary base allows learners to communicate more effectively and comprehend written and spoken texts. Research has shown that repeated exposure to vocabulary in various contexts can improve retention and understanding. Nation (2001) emphasizes that vocabulary knowledge involves not only the ability to recognize and recall words, but also the ability to use them appropriately in different contexts. Video games, with their interactive and contextualized language use, can provide such repeated and varied exposure, making them a valuable tool for vocabulary acquisition.

Several studies have explored the impact of video games on vocabulary learning, for

example, Hartt et al (2020) and Mayer (2024). In addition, deHaan, Reed, and Kuwada (2010) found that playing a music video game significantly improved learners' recall of new vocabulary compared to traditional study methods. Similarly, Miller and Hegelheimer (2006) reported that students who played an adventure game showed better retention of target vocabulary than those who engaged in traditional learning activities. Moreover, Karakoç et al (2022) conducted a meta-analysis that combined the results from experimental studies carried out between 2000 and 2018 on game-based learning and the academic achievement of students, and they concluded that "it can be asserted that game-based learning positively affects student achievement in all the disciplines and it is appropriate to be used in all kinds of courses" (Karakoç, 2022 p.12). These studies suggest that video games can be an effective medium for vocabulary learning, providing both immediate and long-term benefits. Recent research continues to support these findings, indicating that "video games can serve as a complementary tool to traditional learning methods, providing a dynamic and interactive platform for language acquisition" (Smith & Jones, 2022).

Impact of Game Genres and Cultural Relevance on Learning

Different genres of video games may have varying impacts on vocabulary acquisition. Adventure and role-playing games (RPGs) often require players to engage in dialogues and follow complex narratives, which can introduce and reinforce new vocabulary (Torres-Rodríguez et al., 2022). Puzzle and strategy games, on the other hand, might focus more on problem-solving skills but can still enhance language skills through in-game instructions and feedback. Understanding the specific impacts of different game genres can help educators choose the most effective games for vocabulary learning. For instance, games that involve storytelling and character interactions (Corbitt 2023) might be more beneficial for practicing conversational language skills, while games that require reading and following instructions can improve comprehension and contextual vocabulary use.

It is also important to consider the cultural relevance of video games used in educational settings. Games that incorporate culturally relevant content can be more engaging for students and provide contextually appropriate examples of language use. This is particularly important in regions like Saudi Arabia, where cultural norms and values play a significant role in education (Elyas, 2021). Adapting video games to reflect local culture and context can enhance their educational effectiveness and student engagement. This involves not only translating the language used in the games but also ensuring that the themes, characters, and scenarios are

Immediate feedback is a crucial element in the learning process, and video games excel in this area by providing real-time responses to players' actions. This immediate feedback can help learners quickly identify and correct their mistakes, reinforcing correct usage and enhancing retention. Additionally, video games can incorporate various forms of assessment, such as quizzes and challenges, that test learners' understanding and application of new vocabulary in context. These assessments can be integrated seamlessly into the gameplay, making the learning process more engaging and less intimidating for students.

Methodology

This study employed a mixed-methods approach, combining quantitative and qualitative data to provide a comprehensive analysis of the impact of video games on vocabulary acquisition. A quasi-experimental design was used to compare the vocabulary gains of students who engaged in video game-based learning activities with those who followed traditional vocabulary learning

methods. This design has allowed for a robust comparison of the effectiveness of the two approaches while also capturing the subjective experiences of the participants.

The participants are 100 Saudi university students enrolled in English language courses at a public university in Saudi Arabia (100 students responded to the questionnaire, and 20 took part in the interviews). The sample comprises an equal number of both male and female students from various academic disciplines, with ages ranging from 18 to 24. All participants have a basic proficiency in English and have consented to participate in the study. The diverse academic backgrounds of the participants have allowed for a comprehensive understanding of how video games can impact vocabulary learning across different fields of study. Additionally, the study included participants with varying levels of prior experience with video games, which has helped to explore the impact of familiarity with gaming on learning outcomes.

The demographic profile of the participants included age, gender, academic major and prior experience with video games. The majority of the participants are aged between 18 and 22, with a balanced representation of male and female students. The participants are from various academic disciplines, including engineering, business, and humanities. Approximately 60% of the participants report having some prior experience with video games, while 40% have little to no experience. This demographic diversity has ensured that the findings are relevant to a broad range of students and educational contexts.

Data Collection and Procedures

The study used pre-tests and post-tests to measure vocabulary acquisition. The pre-test assessed the participants' baseline vocabulary knowledge, while the post-test evaluated their vocabulary gains after the intervention. Additionally, questionnaires and semi-structured interviews were conducted to gather qualitative data on students' perceptions and experiences. The questionnaires included both closed and open-ended questions to capture a broad range of responses, while the interviews allowed for a more in-depth exploration of individual experiences. The first section of the questionnaire requested demographic information, and the second section utilized a Likert scale and focused on video games in relation to engagement and motivation, contextual learning, interactive and immediate feedback, language anxiety, perceived learning outcomes, and overall experience.

The interviews further explored the themes in the questionnaire described above, with an additional discussion of suggestions for improvement. The use of multiple data collection methods ensured a comprehensive understanding of the research questions (Creswell, 2021). The participants were randomly assigned to either the control group or the experimental group. The control group followed traditional vocabulary learning methods, involving textbook exercises and flashcards, for eight weeks. The experimental group engaged in video game-based learning activities during the same period.

The selected video games are educational games designed to enhance vocabulary acquisition, incorporating elements of word recognition, definition matching, and contextual usage. Both groups received the same amount of instruction time, ensuring that any differences in outcomes can be attributed to the learning methods rather than the amount of exposure. The intervention included structured gaming sessions followed by debriefing discussions to reinforce the vocabulary learned during gameplay.

Quantitative data from pre-tests and post-tests have been analyzed using paired t-tests to compare the vocabulary gains within and between groups before and after the intervention. Baseline data was collected for the control and experimental groups to facilitate the comparison. Qualitative data from questionnaires and interviews have been analyzed thematically to identify common themes and insights related to students' perceptions and experiences. This combination of quantitative and qualitative analysis provides a comprehensive understanding of the impact of video games on vocabulary learning, highlighting both measurable outcomes and subjective experiences. Additionally, the qualitative data has been coded and categorized to identify recurring patterns and themes that provide deeper insights into the students' learning experiences.

Results

Quantitative Findings

The pre-test scores indicate no significant differences in baseline vocabulary knowledge between the control and experimental groups. However, post-test scores reveal significant improvements in vocabulary acquisition for the experimental group compared to the control group. The paired t-test results show that the experimental group had a mean vocabulary gain of 20% ($p < 0.01$), while the control group had a mean gain of 10% ($p < 0.05$). This suggests that video game-based learning is more effective in enhancing vocabulary acquisition than traditional methods.

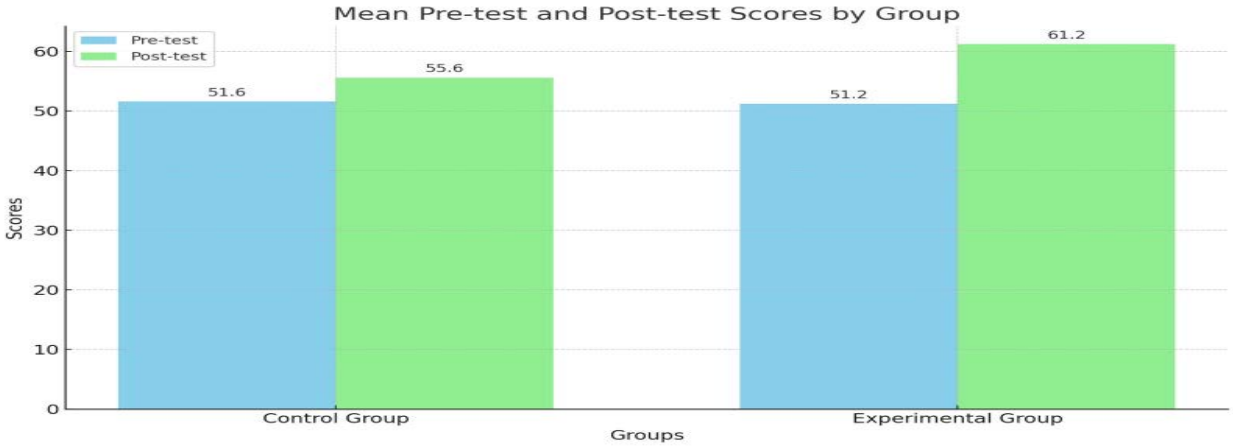


Figure 1, Mean Pre-test and Post-test Scores by Group

Figure 1 presents the mean pre-test and post-test scores for both the control and experimental groups. The control group showed an increase from an average pre-test score of 51.6 to a post-test score of 55.6, indicating a 10% improvement. The experimental group, however, demonstrated a more significant increase from an average pre-test score of 51.2 to a post-test score of 61.2, reflecting a 20% improvement.

Qualitative and Quantitative Findings

The interviews and questionnaires reveal that students generally have positive attitudes toward using video games for vocabulary learning. Thematic analysis of the data has identified several key themes:

1. Engagement and Motivation: Students report that video games are more engaging and enjoyable than traditional learning methods, which increases their motivation to learn and practice new vocabulary. As one participant noted, "Playing video games makes learning fun and less

stressful." Another student stated, "I look forward to my study sessions because they feel like a game, not a chore." This increased motivation can lead to more frequent and prolonged engagement with learning materials.

2. Contextual Learning: Students appreciate the contextualized nature of vocabulary use in video games, which helps them understand and remember new words more effectively. A student commented, "Seeing the words used in different situations helps me remember them better." Another mentioned, "The context provided by the game helps me make sense of new words and how they are used in real-life situations." Contextual learning supports deeper cognitive processing, which enhances retention and recall.

3. Interactive and Immediate Feedback: The interactive nature of video games and the immediate feedback provided help students identify and correct their mistakes, enhancing their learning experience. One interviewee stated, "I like that I can see if I got something wrong right away and try again." Another added, "The instant feedback in the game helps me learn faster and retain more" (Hussein, 2022). Immediate feedback is crucial for learning as it allows learners to quickly adjust their understanding and approach.

4. Reduction of Language Anxiety: Students report feeling less anxious and more confident when using video games to learn vocabulary, as the game environment provides a low-stress setting for practice. A participant mentioned, "I feel more comfortable practicing English in a game than in a classroom." Another echoed, "Games make learning English less intimidating and more approachable" (Alotaibi, 2020). Reducing language anxiety can lead to increased participation and willingness to communicate in the target language.

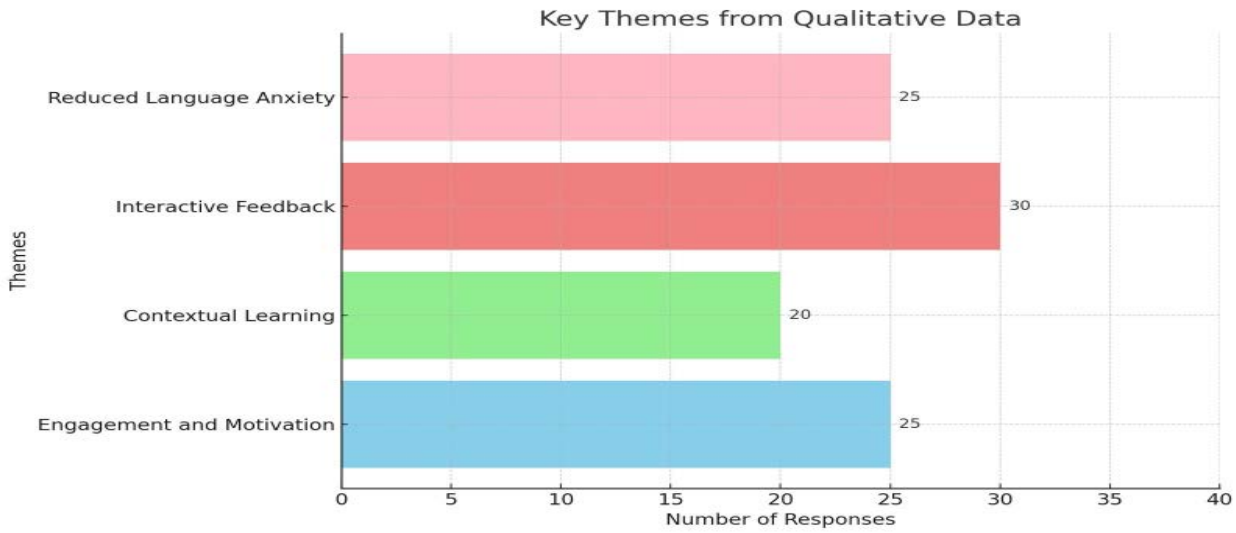


Figure 2. Key Themes from Qualitative Data

Figure 2 illustrates the key themes identified from the qualitative data, highlighting the aspects of engagement and motivation, contextual learning, interactive feedback, and reduced language anxiety that students experienced when using video games for vocabulary learning.

Discussion

The research explored how video games facilitate vocabulary acquisition among Saudi university students. The discussion below focuses on answering the three main research questions,

interpreting the findings in the context of previous studies, and providing implications for language learning.

The findings of this study answer the first research question: Do video games facilitate vocabulary acquisition among Saudi university students? The findings from both quantitative and qualitative data show that video games significantly enhance students' motivation and engagement in learning vocabulary. The data collected suggests that video games can be an effective tool for vocabulary acquisition among Saudi university students. The significant vocabulary gains observed in the experimental group indicate that video games provide a conducive environment for language learning. Participants expressed that video games made learning more enjoyable, mainly because games create a stimulating environment where language is actively used to achieve goals, progress in levels, and solve problems.

This increased motivation is consistent with findings in game-based learning research, which suggests that interactive and immersive experiences engage learners more deeply compared to traditional instructional methods (Prensky, 2001). Many students reported that they were more willing to engage with challenging vocabulary because the games provided immediate, real-world applications. One participant commented, “The thrill of playing the game and using English in a real-time setting made me want to learn more words.”

The motivational boost stems from both intrinsic and extrinsic factors. Intrinsically, students were driven by the desire to perform better in the game, while extrinsically, rewards and progression in the game provided tangible incentives. This dual motivational structure is essential for sustaining engagement and improving vocabulary retention over time. Therefore, integrating video games into language curricula can be an effective strategy to foster higher levels of motivation and engagement, particularly among students who may find traditional methods of learning vocabulary tedious.

Regarding the second research question: What types of video games are most effective for vocabulary learning? A critical insight from the study is that video games offer a rich, contextual learning environment that aids vocabulary acquisition. In traditional classroom settings, vocabulary is often taught in isolation, with students learning lists of words devoid of context. However, video games naturally embed language into meaningful contexts—whether through dialogues with in-game characters, missions that require specific vocabulary use, or interactive tasks that involve language comprehension and production. The research shows that the interactive and immersive nature of video games, combined with their ability to provide immediate feedback and contextualized language use, enhances vocabulary acquisition more effectively than traditional methods. That is, video games that include real-life situations and context; instant feedback, and are fun and interesting, have a positive impact.

One participant remarked, “In the game, I needed to understand the context of the words to win or move forward. It was like I had no choice but to learn the words and use them correctly. This aligns with theories of situated learning, where vocabulary is learned more effectively when encountered in relevant, real-life contexts (Gee, 2003). The contextual learning provided by video games ensures that students are not simply memorizing definitions but actively understanding and applying vocabulary. For instance, when a student needs to choose the correct action or response in a game based on a specific word or phrase, they are forced to process the meaning and application in real time. This deepens their understanding and promotes retention. Additionally, the repeated exposure to words in various situations within games reinforces learning, as students encounter the same vocabulary in different contexts. This aligns with

language acquisition theories, such as Nation's (2001) framework, which emphasizes the importance of multiple exposures to vocabulary for effective retention. Therefore, video games serve as a dynamic and engaging medium for contextual vocabulary learning, which traditional language instruction often lacks.

The third research question is: How do students perceive the use of video games in their language learning process? The findings show that students have positive perceptions of the use of video games, and their use even reduced levels of anxiety around language acquisition. The results of this study are consistent with previous research, which has demonstrated the educational potential of video games. For example, the findings align with those of deHaan et al. (2010) and Miller and Hegelheimer (2006), who reported significant vocabulary gains among students who used video games for language learning. This study adds to the growing body of evidence supporting the use of video games in language education and highlights their potential for vocabulary acquisition. As recent studies suggest, "the integration of video games in language learning can lead to increased vocabulary retention and engagement" (Johnson and Carter, 2021).

Moreover, the feedback mechanism in video games, which provides immediate correction and reinforcement, plays a significant role in retention. When students make mistakes, they receive instant feedback, allowing them to adjust their understanding of the word's meaning or usage right away. In conclusion, video games offer an effective means of enhancing vocabulary retention by combining repetitive exposure, contextual learning, and immediate feedback. This is an area where traditional classroom methods, which often lack interactive and immediate corrective measures, may not perform as well. Therefore, the study suggests that incorporating video games into language curricula could significantly improve vocabulary retention and overall language proficiency.

Implications for Practice

Educators should consider incorporating video games into their teaching strategies to enhance vocabulary learning. Video games can be used as supplementary tools alongside traditional methods, providing students with a diverse and engaging learning experiences. However, it is essential to select games that are educationally relevant and align with learning objectives. Additionally, educators should provide guidance and support to ensure that students use video games effectively for language learning. According to Thompson (2024), "teachers should integrate video games thoughtfully, ensuring they complement rather than replace traditional methods." (p.92).

The findings from this study have broader implications for education beyond vocabulary acquisition. The use of video games in education can promote critical thinking, problem-solving, and collaborative skills, which are essential for success in the 21st century. By incorporating video games into the curriculum, educators can create a more dynamic and interactive learning environment that fosters student engagement and motivation. Moreover, video games can be particularly effective in reaching students who might be disengaged or struggle with traditional teaching methods, providing an alternative pathway to learning and success.

Challenges and Considerations

Despite the potential benefits, there are challenges and considerations that need to be addressed when integrating video games into education. One of the primary challenges is ensuring that the games used are of high educational quality and align with curricular goals. Additionally,

there is a need for teacher training and professional development to equip educators with the skills and knowledge required to effectively integrate video games into their teaching practices. There is also the consideration of balancing screen time with other educational activities to ensure a well-rounded educational experience for students.

Limitations

The study is limited by its sample size and duration. While the results indicate significant vocabulary gains, the sample size of 100 participants may not be representative of the broader population of Saudi university students. Additionally, the eight-week intervention period may not be sufficient to capture the long-term effects of video game-based learning. Future research should involve larger samples and longer intervention periods to validate the findings and explore the long-term impact of video games on vocabulary acquisition. Furthermore, future studies should consider exploring the impact of video games on different language skills, such as listening, speaking, and writing, to provide a more comprehensive understanding of their educational potential.

Conclusion

This research study has examined the impact of video games on vocabulary acquisition among Saudi university students, as well as what types of games are most effective and students' perceptions of their use, using a mixed-methods approach. This research demonstrates that video games can effectively support vocabulary acquisition among Saudi university students. The interactive and engaging nature of video games, combined with their ability to provide immediate feedback and contextualized language use, contributes to improved learning outcomes. Students' positive perceptions of video games for vocabulary learning further underscore their potential as valuable educational tools.

Further studies should explore the long-term effects of video game-based learning and investigate its impact on other language skills, such as grammar and pronunciation. Additionally, research should examine the effectiveness of different types of video games in various educational contexts and among diverse learner populations. By continuing to investigate the educational potential of video games, researchers can provide valuable insights that inform the development of innovative and effective language learning strategies. Future research should also consider the role of teacher support and instructional design in maximizing the benefits of video game-based learning.

Policymakers and educational institutions should recognize the potential of video games as a tool for language learning and consider incorporating them into language education programs. This includes providing the necessary resources and support for the integration of video games into the curriculum, as well as investing in research and development to create high-quality educational games. By embracing innovative approaches to language learning, educational institutions can enhance student engagement, motivation, and learning outcomes, ultimately preparing students for success in a globalized world.

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