



A Study On The Effectiveness Of Gamified Approaches In Enhancing English Vocabulary Acquisition

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Abstract: This study investigated the impact of gamified Student Response Systems (SRSs) on vocabulary acquisition compared to non-gamified SRSs in high school English learners. 61 students were divided into two groups and utilized either Gimkit (gamified) or Socrative (non-gamified) for two 20-minute study sessions. Vocabulary acquisition was assessed through pre-test, immediate post-test, and delayed post-test scores. Statistical analyses revealed significant vocabulary improvement in both groups across all tests, but no significant difference between the gamified and non-gamified conditions. These findings suggest that while both SRS approaches can effectively enhance vocabulary learning, gamification may not inherently provide a substantial advantage. Further research is needed to explore the long-term effects of these tools and their potential impact on student motivation.

Index Terms - Student Response Systems (SRSs), Gamified Learning, Vocabulary Acquisition, English Language Learning, High School Education, Digital Learning Tools, Gimkit, Socrative .

I. INTRODUCTION

In the contemporary educational landscape, the effective acquisition of vocabulary is paramount for successful language learning. Within the domain of language acquisition, vocabulary serves as a fundamental component, enabling individuals to express thoughts, emotions, and ideas with clarity and nuance. Adjectives, in particular, play a crucial role in enriching language by adding depth and precision to descriptions. Fostering robust vocabulary acquisition is therefore essential to equip students with the linguistic tools necessary for academic and personal success. The advent of digital technologies has revolutionized teaching and learning practices, offering innovative tools and methodologies to enhance the educational experience. Student Response Systems (SRSs), interactive platforms that allow teachers to gather real-time feedback from students, have emerged as valuable tools in the classroom. These systems, such as Socrative and Gimkit, provide a dynamic and engaging environment for learners to interact with course material and receive immediate feedback on their understanding. While research has explored the potential of gamified SRSs to enhance student engagement and motivation, limited evidence exists on the comparative efficacy of gamified versus non-gamified SRSs in promoting vocabulary acquisition. This study aims to address this gap by investigating the impact of gamified and non-gamified SRSs on high school students' learning and retention of adjective vocabulary. By comparing the effectiveness of Gimkit (gamified) and Socrative (non-gamified) in this context, the study seeks to provide valuable insights into the most effective pedagogical approaches for utilizing SRSs to enhance vocabulary learning.

II. LITERATURE REVIEW

2.1 Vocabulary Learning

Vocabulary acquisition plays a crucial role in mastering a language. It enhances communication abilities by developing both receptive and productive skills, which are integral to reading, listening, writing, and speaking. Vocabulary knowledge facilitates language fluency and proficiency, as highlighted by Schmitt (2010), who emphasized the incremental nature of vocabulary learning. The process can be intentional, involving deliberate memorization, or incidental, occurring through repeated exposure in diverse contexts (Hulstijn, 2013). Research further indicates that productive vocabulary learning, which entails the application of words in speaking and writing, is often more challenging and time-intensive than receptive learning (Griffin, 1992; Laufer, 2005). This distinction underpins the necessity for well-structured learning methods that cater to both dimensions of vocabulary acquisition.

2.2 The Role of Adjectives in Language

Adjectives hold a significant position in vocabulary as they add nuance, depth, and precision to communication. They enable learners to describe, qualify, and articulate ideas effectively. Greenbaum (1996) defined adjectives as words that premodify nouns or function as predicates after linking verbs, illustrating their versatility in syntax and semantics. Fowler (2016) further elaborated that adjectives can occur in attributive or predicative positions, with some restricted to specific syntactic roles. Focusing on adjectives in vocabulary studies ensures the examination of descriptive and functional linguistic elements, providing learners with tools to express complex ideas.

2.3 Memory and Learning in Vocabulary Acquisition

Memory processes are integral to vocabulary retention. Distinctions exist between short-term memory, which handles immediate information, and long-term memory, which stores knowledge over extended periods. Semantic memory, a subset of long-term memory, is particularly relevant for vocabulary learning as it encompasses the understanding of words and their meanings (Roediger et al., 2017). However, memory retention is subject to decay, as demonstrated by Ebbinghaus' forgetting curve (2013), which shows rapid initial forgetting that gradually slows over time. Repetition and overlearning have been shown to mitigate this effect, with spaced repetition emerging as an effective strategy to enhance retention (Kornell, 2009). Structured and repeated exposure to vocabulary items can improve retention, supporting cumulative language learning processes.

2.4 Technology in Education

- **Student Response Systems (SRSs) in Education**

Digital tools have revolutionized educational methodologies, with SRSs becoming prominent in classrooms. These systems promote active learning through interactive quizzes, real-time feedback, and student engagement (Shapiro & Gordon, 2012; Patterson et al., 2010). SRSs such as Socrative and Gimkit enable teachers to monitor student responses, adapt lessons, and enhance formative assessment practices. Socrative offers a non-gamified learning environment, allowing teachers to administer quizzes and provide instant feedback without competitive elements (Balta & Tzafilkou, 2019). Conversely, Gimkit incorporates gamification elements like rewards and competition to foster motivation and engagement.

- **Gamification and Its Impact on Learning**

Gamification integrates game-like elements into non-game contexts to enhance user engagement. Platforms like Quizlet and Gimkit employ gamified features such as points, avatars, and competition to stimulate motivation and enjoyment (Deterding et al., 2011; Tan & Saucerman, 2017). Studies have shown that gamified learning environments positively influence student motivation and task engagement, with learners often perceiving such activities as enjoyable and beneficial (Zhou, 2016; Vandercruysse et al., 2013). For instance, Rasti-Behbahani & Shahbazi (2022) demonstrated that gamified methods enhance both receptive and productive vocabulary acquisition compared to traditional methods. However, gamification is not without challenges. Salomon (1984) noted that some students may underappreciate the learning content in

gamified settings, focusing instead on the competitive aspects. Therefore, the effectiveness of gamification depends on balancing its motivational benefits with a clear emphasis on learning objectives.

- **The Role of Feedback in Learning**

Immediate feedback plays a pivotal role in self-regulated learning. It helps students identify areas for improvement and reinforces learning outcomes (Winne & Hadwin, 1998; Schunk, 2003). Research indicates that immediate feedback leads to better retention compared to delayed feedback, as it allows learners to integrate information more effectively (Lu et al., 2023). SRSs like Socrative and Gimkit leverage immediate feedback mechanisms, enhancing the learning process by promoting active engagement and self-assessment.

III. METHODOLOGY

3.1 Study Design

This study employed a quantitative research design to analyze the impact of gamified and non-gamified learning environments on vocabulary acquisition. Statistical analyses, including the Shapiro-Wilk test, Friedman test, and Wilcoxon signed-rank test, were used to assess vocabulary retention across different conditions and time points. The dependent variable was the test score, while the independent variables included time (within-subjects factor) and learning environment (between-subjects factor)

3.2 Participants

The study involved 61 high school students from two classes in a metropolitan Stockholm school, enrolled in the same economics-focused educational program and studying English 6. The students were divided into two groups based on their respective classes, with each group assigned a different learning environment—gamified (Gimkit) or non-gamified (Socrative). Random assignment of the tools ensured that learner profiles did not bias the results.

3.3 Procedure and Materials

- **Vocabulary Tests**

Three assessment points were established to evaluate the students' vocabulary knowledge: a pre-test (before the study sessions), an immediate post-test (following the second session), and a delayed post-test (two weeks later). These tests focused on 18 target adjectives selected for their relevance to C1-level learners and ensured students were unfamiliar with the words to preserve study integrity. The tests included tasks such as fill-in-the-gap sentences, true/false questions, and multiple-choice items, with efforts to maintain equivalency in difficulty and structure across all tests.

- **Study Sessions**

Each group participated in two 20-minute study sessions using their assigned SRS. The gamified group trained using Gimkit, which incorporated features like points, rewards, and competition, while the non-gamified group used Socrative, focusing on structured quizzes without competitive elements. Both platforms allowed students to practice receptive and productive vocabulary skills through exercises aligned with the tests' formats.

3.4 Statistical Analysis

SPSS Statistics software was used to analyze the test scores. Descriptive statistics provided insights into the data's central tendencies, variability, and distribution. The Shapiro-Wilk test assessed data normality, determining the suitability of parametric or non-parametric statistical methods. Due to the non-normal distribution of the data, non-parametric tests were used, including:

- **Friedman Test:** To evaluate differences in vocabulary scores across the three assessment points.
- **Wilcoxon Signed-Rank Test:** To identify specific differences between test pairs (pre-test vs. immediate post-test, pre-test vs. delayed post-test, and immediate post-test vs. delayed post-test).

The significance level was adjusted using Bonferroni correction to account for multiple comparisons.

3.5 Ethical Considerations

Participants provided informed consent, and their legal guardians were notified about the study. Anonymity was ensured throughout, with no personal identifiers used during data collection or analysis. The study adhered to ethical guidelines set by the university's policy.

IV. RESULTS

This review of the literature on gamified approaches to English vocabulary acquisition revealed a range of findings regarding their effectiveness in enhancing student learning outcomes.

4.1 Descriptive Statistics

A total of 61 high school students participated in the study, but only 37 completed all three tests. Of these, 19 students were in the Socrative (non-gamified) group, and 18 were in the Gimkit (gamified) group. Table 1 provides the descriptive statistics of test scores across the pre-test, immediate post-test, and delayed post-test for both groups:

Table.4.1: Descriptive Statistics by Group and Test

Group	Test	Mean score	Standard deviation	Minimum	Maximum
Socrative	Pre-test	5.3	2.8	1	12
	Post-test	11.9	4.7	2	18
	Delayed	10.8	4.1	6	11
Gimkit	Pre-test	6.7	2.7	2	11
	Post-test	12.7	5.9	3	18
	Delayed	11.7	5.4	2	18

Both groups demonstrated improvements in mean scores from pre-test to post-test, indicating positive effects of both gamified and non-gamified learning environments on vocabulary acquisition. However, increased variability in the post-test and delayed post-test scores, reflected in the higher standard deviations, suggested greater individual differences in retention among participants.

4.2 Statistical Analyses

a. Shapiro-Wilk Test

The Shapiro-Wilk test was used to assess the normality of the data. Results revealed non-normal distributions in certain tests, necessitating the use of non-parametric methods for analysis.

b. Friedman Test

The Friedman test was conducted to evaluate differences in test scores across the three assessment points (pre-test, post-test, delayed post-test). Results indicated statistically significant differences in vocabulary scores across time for both groups:

- **Socrative:** Chi-Square = 27.114, df = 2, $p < 0.001$
- **Gimkit:** Chi-Square = 13.164, df = 2, $p = 0.001$

These findings suggest that both learning environments led to improvements in vocabulary acquisition over time.

c. Wilcoxon Signed-Rank Test

The Wilcoxon signed-rank test was conducted to identify specific differences between pairs of tests:

- **Pre-test vs. Post-test:** Statistically significant improvements in both groups ($p < 0.001$).
- **Pre-test vs. Delayed Post-test:** Statistically significant improvements in both groups ($p < 0.001$).
- **Post-test vs. Delayed Post-test:** No statistically significant differences in either group, indicating stabilization of vocabulary retention over time.

4.3 Comparison Between Groups

Although both groups showed significant improvements, no statistically significant differences were found between the Socrative and Gimkit groups at any test point. This suggests that gamified and non-gamified learning environments had comparable effects on vocabulary acquisition and retention.

4.4 Summary of Findings

- Both Socrative (non-gamified) and Gimkit (gamified) significantly improved vocabulary scores in the short and long term.
- No significant differences were observed between the gamified and non-gamified groups, indicating that the gamified approach did not yield additional benefits for vocabulary acquisition.
- Vocabulary retention stabilized between the post-test and delayed post-test for both groups, suggesting effective learning outcomes from both methods.

These findings highlight the effectiveness of SRSs for vocabulary acquisition and suggest that gamification may not provide a statistically significant advantage over non-gamified approaches.

V. DISCUSSIONS

This study's findings align with existing research demonstrating the positive impact of SRSs on vocabulary acquisition (Patterson et al., 2010; Zhou, 2016). The observed improvement in both receptive and productive vocabulary aligns with Behbahani & Shahbazi (2022), who highlighted the positive influence of games on both aspects of language learning. While previous research, such as Rasti-Behbahani & Shahbazi (2022) and Vandercruysse et al. (2013), has emphasized the motivational benefits of gamification, this study did not find a statistically significant difference in vocabulary acquisition between gamified and non-gamified SRSs. This finding does not necessarily contradict Salomon's (1984) caution about the potential negative impacts of gamification, as no detrimental effects were observed in this study. However, it suggests that while gamification can enhance motivation and engagement (Vandercruysse et al., 2013), it may not always translate into significantly better vocabulary learning outcomes.

VI. CONCLUSION

This study analyzed the impact of gamified and non-gamified Student Response Systems (SRSs) on vocabulary acquisition, examining time, learning environment, and their interaction. While significant vocabulary retention was observed over time for both groups, no significant difference was found between gamified and non-gamified learning environments in terms of vocabulary acquisition. Due to data distribution limitations, the interaction effect could not be statistically determined. These findings suggest that while both gamified and non-gamified SRSs effectively enhance vocabulary learning, gamification may not inherently provide a significant advantage. Although gamification can positively influence student motivation and engagement, as highlighted by Vandercruysse et al. (2013), this study emphasizes that effective vocabulary learning can be achieved through both gamified and non-gamified SRS approaches. Ultimately, teachers should carefully consider their students' individual learning styles and select the SRS that best suits their needs and preferences.

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