

The Impact of Gamification on Motivation and Retention in Language Learning: An Experimental Study Using a Gamified Language Learning Application

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Abstract

This study investigates the effects of gamification elements such as points, levels, and badges on motivation and retention in language learning. An experimental design was employed, observing two groups of learners over a 10-week period. One group engaged with a gamified version of a language learning app, while the control group used the app without these features. Key variables, including time spent on the app, lesson progression, and motivation levels, were analysed through surveys and usage data. Results indicated a significant increase in both motivation and retention within the gamified group, providing empirical support for integrating game mechanics into language learning.

Keywords

Gamification, Motivation, Retention, Language Learning, Educational Technology.

Introduction

Language learning is an essential component of education in today's globalized world. Proficiency in a second language enables individuals to engage with diverse cultures, access broader opportunities, and participate in international communication. The advent of digital technology has significantly reshaped language education, with mobile-based applications offering a convenient and flexible platform for learners to engage with language content at their own pace. These apps incorporate interactive exercises, real-time feedback, and personalized learning pathways, addressing certain limitations of traditional classroom environments (Godwin-Jones, 2014). However, a common challenge facing educators and app developers is sustaining learner motivation and ensuring long-term engagement. Research indicates that while many users show initial enthusiasm, they often discontinue language learning apps due to a lack of sustained motivation (Pilli & Aksu, 2013). This trend raises a key question: how can language learning apps maintain consistent engagement over time?

One potential solution lies in gamification, a strategy that applies game-like elements such as points, levels, and rewards to non-game settings, with the goal of increasing user engagement (Deterding et al., 2011). In education, gamification has gained attention for its ability to enhance motivation, engagement, and performance by drawing on principles from game design, like competition, achievement, and social interaction, which create a more

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interactive learning experience (Kapp, 2012). In language learning, gamification transforms repetitive practice into an engaging process by providing learners with incentives such as points, badges, and levels. These elements tap into intrinsic and extrinsic motivational drivers like mastery, autonomy, and recognition, which are foundational to Self-Determination Theory (Deci & Ryan, 1985). Despite gamification's potential, limited research exists on its effectiveness in language learning apps, and it remains unclear whether these game-like elements contribute to sustained engagement or simply offer a temporary boost in motivation. This study seeks to address this gap by investigating whether the integration of gamification in language learning apps can improve learner motivation, retention, and learning outcomes. Specifically, it will examine whether gamified features lead to increased usage, higher retention rates, and faster lesson completion compared to non-gamified versions of the app. The study's findings could provide valuable insights for language educators, app developers, and policymakers looking to enhance digital learning tools. Additionally, the research contributes to the broader field of educational technology by exploring how gamification strategies may improve learning outcomes across various domains.

Review of literature

The foundation of this study is based on Self-Determination Theory (SDT) by Deci and Ryan (1985), which highlights three psychological needs: autonomy, competence, and relatedness. These needs drive intrinsic motivation, which enhances engagement and persistence, essential in language learning contexts where motivated learners are more likely to succeed (Dörnyei, 2001). Gamification, integrating elements like points, badges, and leaderboards, aligns well with SDT by fulfilling these needs; progress tracking boosts competence, optional challenges foster autonomy, and social leaderboards build relatedness (Ryan & Deci, 2000). By transforming traditional learning environments into engaging, interactive experiences, gamification offers a compelling solution to sustain motivation over time (Kapp, 2012). In educational fields like math and science, gamification has shown promising results in motivation and performance, yet its specific impact on language learning remains underexplored (Goehle, 2013; Ibáñez et al., 2014). Studies on gamification in language learning indicate increased motivation, engagement, and vocabulary retention (Werbach & Hunter, 2012; Sánchez et al., 2015; Muntean, 2011). Game elements such as points, badges, and leaderboards enhance retention and continued app usage by fostering competition and progression (Zichermann & Cunningham, 2011). Moreover, these elements cultivate a flow state where learners are fully engaged, a mental state beneficial for language acquisition as it promotes attention and cognitive engagement (Csikszentmihalyi, 1990).

Although gamification in digital language platforms has shown promise for retaining learners, there are concerns about over-reliance on extrinsic rewards, which may detract from intrinsic motivation (Nicholson, 2015). Not all learners respond equally to gamification; some may feel discouraged by competition, while others may find rewards trivial (Biro, 2013). Furthermore, while short-term studies suggest positive effects, more longitudinal research is needed to assess the sustainability of these benefits (Dicheva et al., 2015). Overall, gamification holds potential for enhancing motivation and retention in language learning; however, it must be designed to support intrinsic motivation and consider individual learner differences to maximize effectiveness. This study employs a rigorous data collection procedure to assess the impact of gamification on learner motivation, retention, and progression in a language learning app. The quasi-experimental design includes pre-tests, post-tests, and ongoing monitoring of app usage.

Methodology and Data collection procedure

This study aims to assess the impact of gamification on language learning through a quasi-experimental design involving 100 participants divided into two groups: one using a gamified app and the other using a non-gamified version. Participants will be matched based on proficiency, age, gender, and background to ensure comparability. Before the intervention, all participants will take a pre-test to establish baseline language proficiency and complete a motivation survey to gauge their initial motivation levels. Over six weeks, participants will use the app for at least 30 minutes daily. The experimental group will engage with gamified features such as points, badges, levels, and leaderboards, while the control group will use the standard version without these elements. App usage data will be collected to monitor time spent, lessons completed, and engagement metrics. Additionally, motivation surveys will be conducted at the midpoint and end of the intervention, along with a retention survey to assess participants' willingness to continue using the app.

At the end of the six weeks, all participants will take a post-test to evaluate improvements in language proficiency, allowing for comparisons between the two groups. To gain deeper insights into user experiences, selected participants will also join focus group interviews. The study will combine quantitative and qualitative data to validate findings and provide a comprehensive analysis of the influence of gamification on language learning. Informed consent will be obtained from all participants, ensuring their rights to withdraw and maintaining data anonymity to protect privacy.

Data Analysis and Evaluation

- **Quantitative Data Analysis:** Quantitative data will be sourced from pre-test and post-test results, app usage data, and motivation/retention surveys, analysed using SPSS or R statistical software.
- **Pre-Test and Post-Test Analysis:** Assess improvements in language proficiency between the experimental (gamified app) and control (non-gamified app) groups.
- **Statistical Tests:** Paired-samples t-test for within-group comparisons, Independent-samples t-test for between-group comparisons
- **Hypotheses:** Null Hypothesis (H0): No significant difference in proficiency gains between Groups. Alternative Hypothesis (H1): The gamified group shows greater proficiency gains.

Table 1: Descriptive Statistics of Pre-Test and Post-Test Scores

Group	N	Pre-Test Mean	Pre-Test SD	Post-Test Mean	Post-Test SD	Mean Difference	p-value (t-test)
Experimental	50	60.5	8.2	80.4	9.1	19.9	< 0.05
Control	50	60.8	8.3	70.1	7.8	9.3	< 0.05

The table summarizes the pre-test and post-test scores for the experimental and control groups, each with 50 participants. The experimental group showed a significant improvement (mean difference of 19.9, $p < 0.05$), while the control group demonstrated a smaller but also

significant gain (mean difference of 9.3, $p < 0.05$). Overall, the experimental group outperformed the control group in language proficiency improvement.

a. App Usage Data Analysis

Table 2: Descriptive Statistics of App Usage (Time Spent and Lessons Completed)

Group	N	Average Time Spent (hours)	SD	Average Lessons Completed	SD	p-value (t-test)
Experimental	50	25.3	4.8	30	3.2	< 0.05
Control	50	15.6	5.1	22	4.1	< 0.05

The table compares app usage between the experimental and control groups, each with 50 participants. The experimental group averaged 25.3 hours of usage (SD = 4.8) and completed 30 lessons (SD = 3.2). In contrast, the control group averaged 15.6 hours (SD = 5.1) and completed 22 lessons (SD = 4.1). The p-values for both metrics are less than 0.05, indicating statistically significant differences. This suggests that the experimental group engaged more with the app than the control group.

b. Motivation and Retention Surveys: The motivation and retention surveys assess changes in learner motivation at three stages: pre-test, midpoint, and post-test, as well as the likelihood of continued app usage. The survey data will be analysed using descriptive statistics and ANOVA to identify differences between groups over time.

Group	N	Pre-Test Motivation	Midpoint Motivation	Post-Test Motivation	p-value (ANOVA)
Experimental	50	3.5	4.2	4.8	< 0.05
Control	50	3.6	3.7	3.8	< 0.05

Table 3: Motivation Survey Results (Mean Scores)

The table presents motivation levels for both groups. The experimental group increased from a pre-test score of 3.5 to 4.8 by the post-test. In contrast, the control group showed a slight increase from 3.6 to 3.8. The p-value (< 0.05) indicates statistically significant changes in motivation over time, with the experimental group showing a substantially greater improvement compared to the control group.

c. Qualitative Data Analysis

i. Motivation and Engagement

The first table compares the pre-test and post-test performance of two groups: the experimental group (gamified) and the control group (non-gamified). The experimental group showed a mean difference of 19.9 in post-test performance, compared to 9.3 in the control group, indicating significant improvement due to gamification. The p-value (< 0.05) confirms this enhancement is statistically significant. Gamification satisfies intrinsic needs such as curiosity, autonomy, and mastery, leading to increased motivation. Elements like points and rewards provide immediate feedback and a sense of accomplishment, keeping learners engaged. Additionally, extrinsic motivators, such as badges and leaderboard rankings, further

drive commitment to language-learning goals. This combination fosters sustained interest and increased engagement, evident in the experimental group's significant performance gains.

ii. Retention and Continuous App Usage

The second table examines how gamification affects time spent and lessons completed. The experimental group averaged 25.3 hours on the app and completed 30 lessons, compared to the control group's 15.6 hours and 22 lessons. These findings demonstrate that the gamified environment enhances retention and encourages consistent usage. Gamification promotes ongoing engagement, which is critical for language mastery. By creating a habit of learning, gamified systems reinforce positive behaviour's through rewards, progression tracking, and interactive features, combating learner fatigue and enhancing long-term retention.

iii. Motivation over Time

The third table tracks motivation levels at three intervals: pre-test, midpoint, and post-test. The experimental group's motivation rose from 3.5 to 4.8, while the control group saw a minimal increase from 3.6 to 3.8. The significant difference in motivational growth between the two groups, supported by a p-value (< 0.05) from ANOVA, underscores gamification's role in sustaining learner motivation. The overall analysis suggests that gamification significantly enhances language learning experiences by improving motivation, retention, and progression. Integrating game-like elements fosters a structured and engaging environment, encouraging consistent practice and deeper engagement with the material. Consequently, gamified learning apps hold great potential for revolutionizing language education, making learning rewarding and effective.

Conclusion

This study underscores the significant potential of gamification as an effective strategy to enhance motivation, engagement, and retention in language learning. Grounded in Self-Determination Theory (SDT), gamification effectively addresses learners' psychological needs for autonomy, competence, and relatedness. By incorporating game mechanics such as points, badges, levels, and leaderboards, language learning can be transformed into a dynamic and rewarding experience. This transformation is particularly vital in language acquisition, where sustained motivation and consistent practice are essential for success. The research indicates that gamification not only fosters intrinsic motivation but also enhances extrinsic motivation, leading to increased learner engagement and improved performance compared to non-gamified environments. However, it is crucial to recognize the limitations of gamification, particularly concerning its long-term sustainability. There is a risk that learners may prioritize earning points and badges over genuine language mastery, and not all students may respond positively to gamified approaches. Despite these challenges, the existing literature affirms that gamification can be a valuable tool in the language learning process, especially when thoughtfully designed to align with learners' individual needs and intrinsic motivations. Moving forward, future research particularly longitudinal studies will be essential to evaluate the sustained effectiveness of gamification in language education. Additionally, it is important to explore strategies that balance extrinsic rewards with more meaningful, deeper learning

outcomes, ensuring that gamification serves not just as a temporary boost but as a lasting catalyst for language mastery.

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