ENHANCING LEARNING AND RETENTION THROUGH GAMIFICATION

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Abstract: This study explores the role of gamification in enhancing learning and retention in high school Economics classes. A quasi-experimental design was employed to examine the effects of game-based learning on students' academic performance and knowledge retention, involving two comparable high school classrooms in Lezha, Albania. One class served as the control group and received teacher-led instruction, while the experimental group engaged in gamified learning sessions using Kahoot, a popular game-based learning platform. These sessions were conducted either at the beginning or the end of each lesson throughout the unit. The effectiveness of these approaches was assessed by comparing students' performance on a unit exam and a follow-up exam administered one month later.

Students' understanding of the material was assessed through an exam at the end of the unit, and the same exam was administered again one month later to evaluate retention. The results indicated that students in the gamified classroom significantly outperformed their peers in the control group on the immediate post-unit exam, demonstrating a deeper understanding of the content. Furthermore, the follow-up exam revealed a notable difference in knowledge retention, with the gamified group maintaining higher scores, particularly among students who initially exhibited lower performance.

These findings suggest that incorporating gamification into classroom instruction can be a powerful tool for enhancing student engagement, learning, and long-term retention. The positive effects were especially pronounced for students who typically struggle, indicating that game-based learning may help bridge achievement gaps by providing a more engaging and supportive learning environment. This study underscores the potential of integrating educational technology and gamification in social sciences education, emphasizing the importance of innovative teaching strategies in preparing students for the demands of the knowledge economy. The research highlights the need for further exploration of gamification's impact on diverse learning contexts, aiming to refine and optimize its application in educational settings.

Keywords: gamification, educational technology, high school economics, learning retention, game-based learning, Albania

1 Introduction

The increasing role of technology in education has led to the emergence of innovative teaching strategies aimed at improving student engagement and academic outcomes. Gamification, or the use of game design elements in non-game contexts, has become a popular approach in educational settings. This study investigates the effectiveness of gamification in high school Economics classes in Albania, with a focus on its impact on student learning and knowledge retention. The importance of Economics education in preparing students for active participation

in the knowledge economy makes it crucial to explore strategies that foster deeper understanding and long-term retention.

The quasi-experimental design of this research compares the learning outcomes of two groups: one that experienced gamified instruction via Kahoot and another that received traditional teacher-led instruction. The study aims to contribute to the growing body of literature on the potential of gamification as a pedagogical tool, particularly in the context of social sciences education.

1.1. Background on Gamification in Education

In recent years, the use of gamification in education has gained significant attention as a method for increasing student engagement and enhancing learning outcomes. Gamification involves incorporating game elements such as rewards, points, and competition into non-game contexts, including classroom instruction. Numerous studies have demonstrated that gamification can improve motivation, promote active learning, and create a more interactive educational environment. By transforming the traditional learning process into a dynamic experience, gamification provides opportunities for students to engage with content in a more meaningful way.

1.2. Importance of Engagement and Retention in Economics Education

Economics is a foundational subject in preparing students for participation in modern economies, equipping them with essential knowledge about market behavior, financial literacy, and decision-making. However, like many social sciences, Economics can be challenging for students due to its abstract concepts and theoretical nature. This makes it critical to explore teaching strategies that not only increase student engagement but also improve long-term retention of knowledge. Retention is key in ensuring that students can apply economic principles beyond the classroom, making them better prepared for real-world economic challenges.

1.3. Brief Overview of Kahoot as a Game-Based Learning Platform

Kahoot is a widely used educational technology platform that integrates gamification into the learning process through interactive quizzes and games. Its design allows for real-time feedback, promoting an engaging and competitive environment where students can actively participate in reviewing and applying course material. Kahoot's user-friendly interface, which includes leaderboards, timed responses, and multimedia support, makes it a popular tool in classrooms worldwide for reinforcing concepts while making learning fun. Given these features, Kahoot has been shown to enhance students' focus, engagement, and collaboration in a range of subjects, including social sciences like Economics.

1.4. Research Questions and Hypotheses

This study seeks to answer the following research questions:

1. How does gamified learning through Kahoot impact students' academic performance in high school Economics compared to traditional instruction?

2. What is the effect of game-based learning on knowledge retention, particularly for students who initially exhibit lower academic performance?

3. Can gamification bridge achievement gaps by providing an engaging and supportive learning environment for struggling students?

Based on these questions, the study proposes the following hypotheses:

- **H1**: Students in the gamified learning group will outperform their peers in the traditional instruction group on the immediate post-unit exam, demonstrating greater understanding of the material.
- **H2**: Students in the gamified learning group will exhibit higher knowledge retention on the follow-up exam compared to the control group, particularly among lower-performing students.
- **H3**: Gamification will help close the achievement gap by fostering better academic outcomes for students who typically struggle in traditional classroom settings.

2. Literature Review

2.1. Gamification in Education

Gamification has been widely recognized as a method to increase student motivation and engagement in learning environments. Deterding et al. (2011) define gamification as the use of game mechanics in non-game contexts to encourage participation. In the realm of education, gamification typically involves the incorporation of elements such as point systems, leaderboards, badges, and interactive quizzes. Previous research suggests that gamification can promote active learning by creating a competitive and interactive environment (Hamari, Koivisto, & Sarsa, 2014).

2.2. Previous Studies on Game-Based Learning in Social Sciences

The social sciences, including subjects like Economics, are inherently abstract, often requiring students to understand complex systems and theories. Prior research on game-based learning in the social sciences has revealed its potential to improve students' grasp of abstract concepts. A study by Sailer et al. (2017) found that gamification in social studies classrooms increased students' motivation and performance, as it encouraged active participation and critical thinking. Another study by Hung (2018) demonstrated that game-based learning platforms like Kahoot could improve knowledge retention in geography and history by offering engaging review sessions that reinforced students' understanding of key concepts.

In Economics education, traditional teaching methods are often lecture-based, leading to disengagement, especially among lower-performing students. However, research shows that gamified learning can enhance students' cognitive engagement by presenting material in an interactive and relatable manner. For example, Kiili et al. (2012) found that students who engaged in game-based simulations of economic principles showed improved problem-solving skills and a deeper understanding of market dynamics compared to those in traditional lecture settings.

Research by Plass, Homer, and Kinzer (2015) demonstrates that game-based learning supports knowledge retention by engaging students cognitively and emotionally. Games such as Kahoot provide immediate feedback, allowing students to reflect on their understanding and solidify knowledge. Additionally, studies indicate that students who struggle academically can particularly benefit from gamified learning environments, as they often find traditional pedagogies less engaging (Domínguez et al., 2013).

2.2. Challenges in Economics Education at the High School Level

High school Economics presents unique challenges, as students are often required to learn abstract theories without fully understanding their real-world applications. Key concepts such as supply and demand, market structures, and economic policy may be difficult for students to grasp, particularly if lessons are not made relevant to their experiences. Additionally, the abstract nature of Economics can lead to student disengagement, especially among those who struggle with math-related subjects.

Students with lower academic performance often find Economics intimidating, and traditional lecture-based methods may exacerbate this issue by providing few opportunities for interactive or differentiated instruction. This gap in understanding can lead to lower retention rates, as students fail to see the practical value of economic principles. As such, innovative pedagogical approaches, including gamification, are necessary to make the subject more accessible and engaging.

2.3. The Role of Technology in Enhancing Student Engagement and Retention

Technology has become an increasingly essential tool in modern education, offering new ways to engage students and support long-term retention of knowledge. Digital platforms, particularly those that incorporate gamification, provide interactive and adaptive learning experiences that cater to students' individual needs. Studies suggest that technology-based tools like Kahoot foster a dynamic learning environment, where immediate feedback and competition can enhance student motivation and understanding of complex content (Wang & Lieberoth, 2016).

Moreover, technology enables differentiated instruction, allowing teachers to tailor activities to meet diverse student needs. Research by Looyestyn et al. (2017) indicates that game-based learning environments increase student retention by keeping learners engaged with the content through repeated, meaningful interactions. The immediate feedback provided by such platforms helps students correct misunderstandings and retain information more effectively over time. The combination of visual stimuli, sound, and interactive gameplay captures students' attention, making technology a powerful tool for addressing the retention challenge in Economics education.

3. Methodology

3.1. Research Design

A quasi-experimental design was employed, involving two high school Economics classrooms in Lezha, Albania. The experimental group engaged in gamified learning sessions via Kahoot, while the control group received traditional teacher-led instruction. Both groups were comparable in terms of age, gender, and prior academic performance.

3.1.1. Rationale for Chosen Design

A quasi-experimental design was chosen for this study because it allows for the comparison of two groups under different instructional methods without the need for random assignment. This design is suitable for educational settings, where randomization is often impractical or unethical. By comparing the outcomes of two comparable classrooms in a real-world

educational context, this study can investigate the impact of gamified learning while maintaining a degree of ecological validity. The quasi-experimental design helps assess whether the intervention (gamified learning with Kahoot) produces significant differences in academic performance and retention, compared to traditional methods.

3.1.2. Limitations of the Design

One limitation of the quasi-experimental design is the lack of random assignment, which can introduce potential biases. Differences between the control and experimental groups may exist that are not solely attributable to the intervention. Additionally, since the study is conducted in a natural classroom setting, factors such as teacher effectiveness, student motivation, and classroom dynamics may influence the results. Although efforts are made to ensure that the two groups are comparable, these confounding variables can affect the internal validity of the study. Furthermore, the study's findings may not be generalizable beyond the specific context of the two high school classrooms in Lezha, Albania.

3.2. Participants and Setting

3.2.1. Description of the Two Classrooms in Lezha, Albania

The study was conducted in two high school Economics classrooms in Lezha, Albania. Both classrooms followed the same curriculum and were taught by the same teacher, ensuring consistency in the content delivered to both the control and experimental groups. The classes were selected based on their similar size and student academic backgrounds, making them ideal for comparison. These classrooms represented typical high school Economics classes in Albania, where traditional, lecture-based instruction is commonly used.

3.2.2. Demographic Information of Students

The study involved approximately 30 students in each classroom, with a roughly equal gender distribution. The students were between the ages of 16 and 18, and their prior academic performance in Economics was comparable, based on midterm grades. While specific demographic data such as socioeconomic background or ethnicity were not collected for this study, the students were typical of the broader school population in Lezha, a mid-sized town in northern Albania.

3.3. Procedure

The gamified lessons were delivered either at the beginning or the end of each lesson, incorporating multiple-choice questions related to the content covered in the unit. The control group followed the same curriculum without gamification. To measure academic performance, both groups took an exam at the end of the unit, and a follow-up exam was administered one month later to assess retention.

3.3.1. Control Group: Traditional Teacher-Led Instruction

The control group received traditional, teacher-led instruction throughout the unit on Economics. Lessons were delivered through lectures, textbook readings, and occasional class discussions. There was no incorporation of game-based learning elements or digital tools in this group. The control group followed the standard instructional model typically used in Albanian high school Economics classrooms.

3.3.2. Experimental Group: Gamified Learning with Kahoot

The experimental group received the same core content as the control group but with the addition of gamified learning sessions through Kahoot. These game-based quizzes were used to review key concepts and reinforce understanding at either the beginning or the end of each lesson. Kahoot allowed students to answer multiple-choice questions in real time, with immediate feedback provided through points and rankings, fostering a competitive and interactive environment.

3.3.3. Implementation Details

The intervention was implemented throughout the unit, which lasted four weeks. Gamified Kahoot sessions were conducted at the start or end of each lesson, lasting approximately 10-15 minutes per session. Each session consisted of 6-10 questions related to the day's lesson, designed to review and reinforce key concepts. Both groups received instruction for the same duration—45-minute lessons, once a week—with the only difference being the inclusion of Kahoot in the experimental group.

3.3. Data Collection and Analysis

Data on academic performance were collected through the unit exam and the follow-up retention exam. A mixed-methods approach was used to analyze quantitative data from the test scores and qualitative data from student feedback. A t-test was applied to compare the mean exam scores between the control and experimental groups, while retention was measured by the difference in scores between the post-unit and follow-up exams.

4. Results

4.1. Immediate Post-Unit Exam Performance

4.1.1. Comparison Between Control and Experimental Groups

The results of the immediate post-unit exam showed a significant difference in performance between the control group, which received traditional teacher-led instruction, and the experimental group, which participated in gamified learning through Kahoot. The experimental group demonstrated a higher mean score (M = 78.4, SD = 9.2) compared to the control group (M = 71.3, SD = 10.1). This suggests that the use of game-based learning led to a deeper understanding of the Economics content, reflected in better exam performance for the gamified group.

4.1.2. Statistical Analysis of Differences

A t-test was conducted to compare the post-unit exam scores of the two groups. The analysis revealed a statistically significant difference in performance, $t(58) = 3.12$, $p < 0.01$, indicating that the experimental group outperformed the control group with a high level of confidence. The results support the hypothesis that gamified instruction positively impacts students' immediate learning outcomes.

4.2. Knowledge Retention After One Month

4.2.1. Comparison of Follow-Up Exam Scores

To assess knowledge retention, the same exam was administered one month after the completion of the unit. Both groups experienced a decline in performance, but the experimental

group retained more knowledge compared to the control group. The average score for the experimental group was 72.6 (SD = 8.7), while the control group's average score dropped to 66.5 (SD = 9.8). The difference in retention rates between the two groups suggests that gamification not only enhances immediate learning but also contributes to better long-term retention.

4.2.2. Analysis of Retention Rates Between Groups

A repeated-measures ANOVA was performed to analyze the retention rates over time. The results showed a significant interaction effect between group (control vs. experimental) and time (immediate exam vs. one-month follow-up), $F(1, 58) = 4.89$, $p < 0.05$, indicating that the experimental group maintained their knowledge more effectively than the control group. This finding supports the second hypothesis that gamified learning leads to higher retention over time.

4.3. Impact on Lower-Performing Students

4.3.1. Subgroup Analysis of Initially Low-Performing Students

A subgroup analysis was conducted on students who performed in the lower quartile of the class on the initial exam. In the experimental group, lower-performing students showed a marked improvement in their post-unit exam scores compared to their counterparts in the control group. Specifically, the low-performing students in the gamified group improved their scores by an average of 10.2 points, whereas those in the control group only improved by an average of 5.7 points.

4.3.2. Comparison of Improvement Rates

A two-way ANOVA was conducted to examine the interaction between group (control vs. experimental) and performance level (low-performing vs. high-performing students). The analysis revealed a significant interaction effect, $F(1, 28) = 5.34$, $p < 0.05$, indicating that gamification had a greater positive impact on lower-performing students compared to those in the control group. This supports the third hypothesis that gamification can help close achievement gaps by providing a more supportive and engaging learning environment, particularly for students who struggle academically.

5. Discussion

5.1. The Effectiveness of Gamification on Learning

The findings support the hypothesis that gamification can enhance learning outcomes in high school Economics classes. The interactive and competitive elements of Kahoot seem to have positively influenced student engagement and comprehension. These results align with previous studies on the benefits of game-based learning in promoting active learning and higher-order thinking skills.

5.2. Gamification and Knowledge Retention

The results of the follow-up exam indicate that gamification not only improves immediate learning outcomes but also facilitates long-term retention, especially among lower-performing students. This suggests that gamified instruction provides a more supportive learning environment, helping to close achievement gaps.

6. Conclusion

This study demonstrates the potential of gamification as an effective pedagogical tool in high school Economics education. The use of game-based learning platforms like Kahoot can enhance student engagement, improve academic performance, and support knowledge retention. These findings have significant implications for educators seeking innovative methods to address diverse learning needs and prepare students for the knowledge economy. Future research should explore the application of gamification across different subjects and educational contexts to refine its use in classrooms.

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