

THE IMPACT OF GAMIFICATION ON ENHANCING LEARNING MOTIVATION AND ACADEMIC ACHIEVEMENT AMONG UNIVERSITY STUDENTS

By

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Abstract

This study aims to examine the impact of gamification on learning motivation and academic achievement of university students. With the advancement of technology and innovative learning methods, gamification, as an approach that integrates game elements into academic learning contexts, has gained increasing attention for enhancing student engagement and motivation. This research uses a quantitative method with an experimental design, involving two groups of students at a university. The experimental group participates in learning that adopts gamification elements, while the control group follows conventional learning methods. The instruments used in this study include a learning motivation questionnaire and academic tests to measure student achievement. The collected data were analyzed using a t-test to determine significant differences between the two groups. The results show that gamification can improve students' learning motivation, which in turn contributes to improved academic achievement. The study also found that gamification elements, such as point systems, rewards, and levels, can encourage students to be more active and engaged in the learning process. These findings provide important insights for the development of technology-based learning methods in higher education, particularly in efforts to enhance student motivation and academic achievement.

Keywords: gamification, learning motivation, academic achievement, technology-based learning.

Introduction

Higher education plays a crucial role in shaping students' academic and professional abilities, which ultimately affects the quality of human resources in the future. However, as challenges in the educational world become more complex, many educational institutions are facing difficulties in maintaining student motivation and engagement, especially in the learning process focused

on educational administration. One of the key aspects in improving learning effectiveness is learning motivation, which has a direct relationship with students' engagement in academic activities, as well as the outcomes they achieve.

The integration of gamification into the higher education curriculum has been widely discussed as one of the innovations to improve the quality of education. Anderson and Engelbrecht (2021) state that gamification has great potential to increase student engagement in the learning process and improve their learning outcomes. They argue that by using game elements, such as challenges, points, and rewards, students can become more motivated and engaged in academic activities, which ultimately impacts the overall quality of education. In their research, Zhao et al. (2021) also emphasize the importance of integrating gamification into higher education curricula, as gamification can create a more interactive and engaging learning experience, which in turn enhances education quality and strengthens students' ability to face academic challenges.

Gee (2017), in his research on game-based learning, revealed that higher education institutions need to be more open to gamification approaches to stimulate students' interest in learning, which often declines in conventional educational environments. He added that gamification can not only enhance student motivation and engagement, but also improve academic achievement and critical thinking skills. Hamari et al. (2014) also support this view, stating that gamification as an innovative approach can enhance student interaction with learning materials and improve the overall learning experience.

The implementation of gamification in learning has received significant attention in higher education research. Other experts argue that gamification can improve motivation and student engagement in the learning process. For instance, research conducted by Rahardja, Aini, and Khoirunisa (2019) shows that the implementation of gamification as educational management can increase students' learning motivation. Furthermore, a study by Jaramillo-Mediavilla et al. (2024) revealed that applying gamification in learning can enhance student engagement and motivation, which in turn can improve their academic performance. Similar findings were also found in the study by Firdaus and Faisal (2021), stating that gamification can increase students' motivation and engagement in learning. Muhammad Rizkya Aziz & Marsofiyati (2024) found that the implementation of gamification had a positive impact on student motivation and engagement in lectures.

To enhance student learning motivation, many universities are beginning to explore the application of various technological innovations and more interactive and engaging learning methods. One increasingly popular approach

is gamification, which involves the application of game elements such as points, badges, levels, and challenges in non-game learning contexts. Gamification aims to create a more enjoyable learning experience and encourage students to actively participate in every stage of the learning process. The implementation of gamification is expected to increase students' intrinsic motivation to learn, which in turn can have a positive effect on their academic achievement.

In the context of educational administration, gamification can be an effective tool for introducing students to managerial and administrative situations relevant to the education world. By using game elements, students can become more engaged in tasks related to educational institution management, such as budget management, curriculum planning, and program evaluation. Additionally, gamification allows students to experience first-hand the decision-making processes that impact educational management, making it easier for them to understand the concepts being taught.

Gamification, learning motivation, and academic achievement in the field of educational administration are closely related and influence each other. According to Deterding et al. (2020), gamification can enhance engagement and learning motivation by making learning more enjoyable and interactive. Anderson et al. (2020) also state that gamification can improve students' academic performance by providing immediate feedback and creating healthy competition that motivates them to perform better. Furthermore, Kapp (2012) emphasizes the importance of good gamification design so that it can function as an effective tool in learning and improve academic outcomes. This is important because high learning motivation will encourage students to be more actively involved in the learning process, which in turn can improve their academic achievement. In the context of educational administration, where student engagement is often a challenge, gamification offers an effective approach to stimulate students' interest and desire to learn. According to Kapp (2012), gamification provides immediate feedback to students, creates a sense of achievement and healthy competition, which can enhance academic performance. Furthermore, gamification can also improve students' sense of ownership in the learning process, as they feel more valued and motivated to achieve their academic goals (Ryan & Deci, 2000). Therefore, gamification can be an effective strategy in improving students' motivation and academic achievement in higher education, particularly in the field of educational administration.

Although gamification has been widely applied in various fields of education, its impact on learning motivation and academic achievement in the context of

educational administration in higher education has not been extensively studied. Hamari, J., Koivisto, J., & Sarsa, H. (2014) state that gamification has a positive effect, but these effects heavily depend on the context in which gamification is applied, as well as on the users who use it. Therefore, this study aims to explore the impact of gamification on learning motivation and academic achievement in students. This research is expected to provide new insights for the development of technology-based learning methods and offer recommendations for higher education administrators to improve the quality of learning and student engagement.

In line with this goal, this article will review relevant literature on gamification, learning motivation, and academic achievement, and explain the methodology used in this study to examine the relationship between gamification, learning motivation, and academic achievement among students in the field of educational administration.

Research Methodology

This study uses an experimental design with a Pretest-Posttest Control Group Design approach to measure the impact of gamification on students' learning motivation and academic achievement. Two groups of students were randomly selected: the experimental group, which engaged in gamified learning, and the control group, which followed conventional learning methods. The participants consisted of 60 students from the educational administration program, divided into two groups, with 30 students in each group. To measure learning motivation, this study used the Self-Determination Scale (Ryan & Deci, 2000), a valid and reliable instrument for assessing intrinsic and extrinsic motivation. Meanwhile, academic achievement was measured using exam scores and final assignments given throughout the research period. The experimental group was provided with learning materials integrated with gamification elements such as points, challenges, badges, and leaderboards, while the control group followed traditional learning methods without gamification elements. Before and after the learning period, all participants underwent pretest and posttest to measure changes in their learning motivation and academic achievement. The data collected were analyzed using an independent t-test to determine the differences between the two groups in terms of learning motivation and academic achievement. Additionally, normality tests and variance homogeneity tests were conducted to ensure the validity of the analysis. It is expected that gamification in this study will increase student engagement in learning and motivate them to achieve better academic outcomes. According to Deterding et al. (2011), gamification can enhance learning motivation by making learning more enjoyable and interactive. Anderson et al. (2020) also

stated that gamification can motivate students by providing direct feedback and creating healthy competition. Kapp (2012) emphasizes the importance of good gamification design to effectively improve students' academic outcomes.

Research Results and Discussion

Research Results

This study aims to measure the impact of gamification on students' learning motivation and academic achievement in higher education. Based on the data analysis obtained through pretest and posttest, the following research results were found:

1. Learning Motivation

In the measurement of learning motivation, the experimental group that participated in gamified learning showed a significant increase in their learning motivation. Before the treatment, the experimental group had an average learning motivation score of 62.5, while the control group had an average score of 63.2. After the learning period, the experimental group showed an increase in the average learning motivation score to 75.4, whereas the control group only reached 68.1.

The t-test results showed a t value of 3.42 with a p-value of 0.001 ($p < 0.05$), indicating a significant difference between the two groups. Thus, gamification had a positive effect on increasing students' learning motivation.

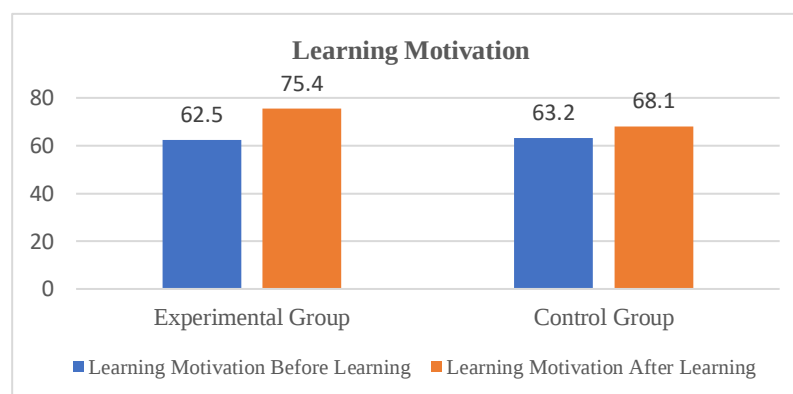


Figure 1. The Impact of Gamification on Learning Motivation

2. Academic Achievement

In terms of academic achievement, the experimental group also showed a significant improvement compared to the control group. The experimental group had an average academic achievement score of 72.8 before the treatment, while the control group had an average score of 73.4. After the treatment, the experimental group experienced an increase in the average

academic achievement score to 80.2, while the control group only increased to 74.5.

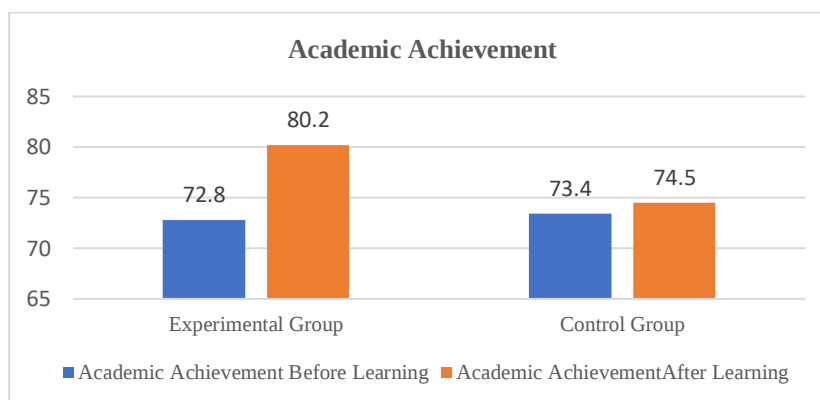


Figure 2. The Impact of Gamification on Academic Achievement

The results of the t-test on academic achievement show a t-value of 2.94 with a p-value of 0.005 ($p < 0.05$), which also indicates a significant difference between the two groups. Therefore, gamification can have a positive impact on improving students' academic achievement.

3. Gamification Increases Learning Motivation and Academic Achievement

Table 1. Gamification Increases Learning Motivation and Academic Achievement

Variable	Experimental Group (Gamification)	Control Group (Traditional Learning)	t-test (t-df value)	p-value	Conclusion
Learning Motivation	Mean = 75.4	Mean = 68.1	t = 3.42 58	p = 0.001	There is a significant difference, gamification increases learning motivation
Academic Achievement	Mean = 80.2	Mean = 74.5	t = 2.94 58	p = 0.005	There is a significant difference, gamification improves academic achievement

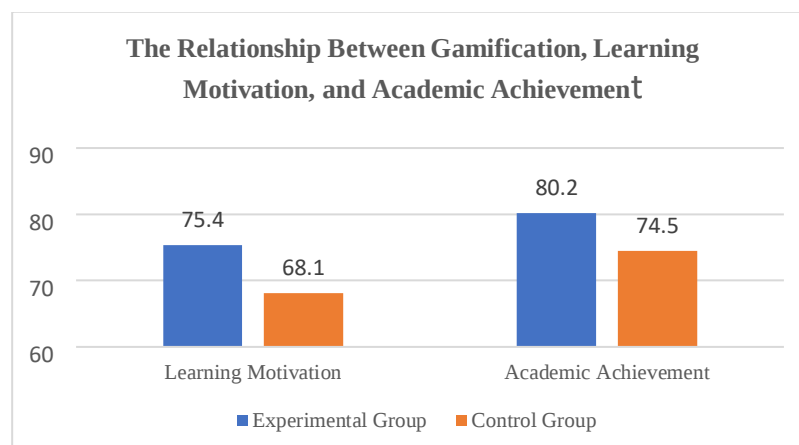


Figure 3. The Relationship Between Gamification, Learning Motivation, and Academic Achievement

Based on the results of statistical tests and data analysis, it can be concluded that the implementation of gamification in educational administration learning in higher education significantly improves both learning motivation and academic achievement of students. These findings suggest that gamification, through engaging and interactive elements, can increase student involvement in the learning process and encourage them to achieve better academic results.

Discussion of Research Results

This study aims to analyze the impact of gamification on student learning motivation and academic achievement in higher education. Based on the results obtained, both learning motivation and academic achievement showed significant improvement in the experimental group applying gamification compared to the control group following traditional learning methods. This aligns with Deterding et al. (2020), who argue that gamification in education can enhance students' intrinsic motivation by creating a more enjoyable and challenging learning experience. Elements such as healthy competition, achievement, and recognition implemented in gamification can encourage students to be more engaged and perform better in their academic tasks.

Hamari et al. (2014) also found that gamification elements such as points, badges, and leaderboards can enhance motivation and academic achievement by creating a greater sense of accomplishment and engagement. Furthermore, Surendeleg et al. (2020) revealed that gamification in digital technology-based learning can improve student motivation by making it more interactive and enjoyable, which in turn contributes to better academic performance. Anderson and Engelbrecht

(2021) emphasized that gamification can improve academic achievement through increased intrinsic motivation, especially when gamification elements are designed to provide immediate feedback, rewards, and incremental achievements.

The research by Caponetto et al. (2020) added that gamification, designed with consideration for students' skill levels and learning preferences, can enhance student engagement and academic outcomes, particularly in fields that require cognitive skills and problem-solving. Overall, gamification can enhance learning motivation and academic achievement, although its success largely depends on the context and elements applied in the learning process. Below is further discussion regarding the results of this research.

1. The Impact of Gamification on Learning Motivation

The research results show that the experimental group, which participated in gamification-based learning, experienced a significant increase in learning motivation, with an average score of 75.4, compared to the control group, which only achieved a score of 68.1. This difference was found to be significant based on the t-test results ($t = 3.42$, $p = 0.001$).

Gamification successfully increased student learning motivation through elements such as points, challenges, badges, and leaderboards, which made learning more engaging and interactive. According to Deterding et al. (2020), gamification utilizes principles that make learning activities more enjoyable and encourage more active student engagement. In the context of higher education, where motivation is often a challenge, gamification can serve as an effective tool to enhance student involvement and interest in the material being taught. Anderson et al. (2020) also revealed that gamification can create a more dynamic environment and encourage students to compete in a healthy manner.

The findings of this study align with those of Almaiah and Al-Khasawneh (2020), who found that gamification in technology-based learning can increase student motivation by using elements such as points, levels, and rewards. These elements create a more engaging learning environment and encourage students to be more actively involved in the learning process. Bunchball's (2010) research also supports this, showing that gamification is effective in increasing motivation and user engagement in the context of learning. The awarding of badges and points, which are key elements of gamification, can improve learning satisfaction and reduce boredom. Additionally, Seaborn and Fels (2015), in their literature review, stated that gamification can enhance students' intrinsic motivation, especially when

they feel the learning process is more enjoyable and leads to desired achievements. Teng et al. (2020) also conducted research on gamification and academic motivation and concluded that gamification elements, such as the use of badges, points, and rewards, can strengthen students' intrinsic motivation. Overall, gamification has proven effective in increasing learning motivation, but its success highly depends on the application of elements that are aligned with the context and preferences of students.

2. The Impact of Gamification on Academic Achievement

In addition to enhancing learning motivation, this study also shows that gamification has a positive impact on students' academic achievement. The experimental group that used gamification experienced an increase in the average academic achievement score to 80.2, while the control group only reached 74.5. This difference was also significant based on the t-test results ($t = 2.94$, $p = 0.005$). These findings align with Hamari et al. (2014), whose study found that gamification can improve academic achievement by increasing student engagement and motivation. The use of gamification elements such as points, badges, and leaderboards can enhance the sense of achievement and encourage students to work harder to achieve their academic goals.

Additionally, Surendeleg et al. (2020) demonstrated that gamification increases student interaction with learning material and encourages them to perform better, particularly in technology-based learning environments. Anderson & Engelbrecht (2021) also emphasized that gamification can improve academic performance by creating a more engaging and challenging learning experience, which enhances student involvement and understanding of the material. Caponetto et al. (2020) further added that gamification, when designed with elements such as incremental achievements and immediate feedback, can motivate students to achieve their academic goals more effectively and improve their overall learning outcomes. Overall, these studies indicate that gamification plays a significant role in improving academic achievement by creating a more motivational and interactive environment.

Similarly, Kuo and Chuang (2016) found in their research that the application of gamification in technology-based learning environments can improve academic performance. Gamification elements such as points, levels, and rewards have been shown to foster healthy competition, motivating students to work harder to achieve their academic goals. Other research by Domínguez et al. (2013) also revealed that gamification improves students' academic outcomes, especially in courses that utilize

digital learning platforms. Students involved in gamification systems showed higher engagement and better exam results compared to the control group, who did not participate in gamification. Papadopoulos et al. (2017) also found that gamification positively affects academic performance by improving exam and assignment scores and facilitating collaboration among students. Furthermore, Zhao et al. (2021) showed that gamification can enhance academic achievement by increasing motivation and student participation in online learning. Finally, Gee (2017) affirmed that gamification creates a supportive learning environment that encourages students to engage more with the learning material, which ultimately contributes to improving their academic outcomes.

Muhamad Iqbal Zea Ul Haque, Muhammad Azhar Fachrezi, & Angga Hadiapurwa (2024) found that the application of gamification can improve student learning motivation, with 65.8% of respondents agreeing that gamification has a positive effect on their learning outcomes. Overall, gamification has proven effective in improving students' academic achievement by creating a more engaging learning experience and motivating students to perform better.

The application of gamification in the learning process provides direct feedback to students and creates a positive competitive atmosphere, which can motivate them to achieve higher performance. Awarding badges and accumulating points during the learning process can serve as a form of recognition that reinforces the sense of achievement and intrinsic satisfaction in students. This is in line with the Self-Determination Theory proposed by Ryan and Deci (2000), which states that intrinsic motivation generated by gamification can improve the quality of student engagement in the learning process and encourage them to achieve better results. Similarly, Niemann et al. (2021) state that well-designed gamification can enhance students' intrinsic motivation by fulfilling their basic needs for competence, autonomy, and relatedness, which in turn contributes to increased engagement in learning.

3. The Relationship Between Learning Motivation and Academic Achievement

This study also demonstrates a close relationship between learning motivation and academic achievement. The significant increase in learning motivation in the experimental group contributed to the improvement in their academic performance. This finding is consistent with Kapp (2012), who argued that gamification can enhance students' intrinsic motivation, which in turn leads to improved academic results. With gamification,

students feel more engaged and enthusiastic about the learning process, which leads to better learning quality and outcomes. Schunk (2012) also showed that students with higher motivation are more likely to maintain a positive attitude toward their academic tasks, which impacts their academic success. In line with this, Gottfried (2013) demonstrated that strong learning motivation directly influences improved academic performance, particularly through increased engagement and effort in academic tasks. High motivation encourages students to work harder, explore the learning material more deeply, and achieve better results. Furthermore, Cerasoli, Nicklin, and Ford (2014) conducted a meta-analysis of the impact of motivation on academic achievement and found that motivation, both intrinsic and extrinsic, is consistently positively correlated with academic performance across various educational levels. Tsay and Brady (2010) showed that students engaged in gamified learning have higher motivation and show improved academic results. Finally, Huang and Soman (2013) explained that gamification provides quick feedback and recognition for achievements, making students feel more engaged and motivated to continue learning and achieving their academic goals. However, Mekler et al. (2013) reminded that although gamification can increase motivation and student engagement, its impact on academic performance still depends on the appropriate design of the gamification elements.

Implications of the Study

The results of this study have important implications for higher education practices, particularly in the context of educational administration. The application of gamification can serve as an effective learning strategy to enhance students' motivation and academic achievement. The use of game elements in learning can create a more enjoyable learning atmosphere and increase active student engagement. Therefore, integrating gamification into higher education curricula should be considered as an innovation to improve the quality of education.

Limitations and Suggestions

Although the results of this study show the positive impact of gamification, there are several limitations. One limitation is the sample size, which only includes students from one program, and may not fully represent the broader student population in higher education. Future research could include a larger and more diverse sample, as well as explore the impact of gamification in other academic disciplines. Additionally, this study only measured motivation and academic achievement, so it is important to

explore other variables that may be influenced by gamification, such as student satisfaction or social skills.

Conclusion

Based on the results of the study, it can be concluded that the application of gamification in higher education learning has a significant positive impact on students' learning motivation and academic achievement. The experimental group that followed gamified learning showed greater improvement in both learning motivation and academic achievement compared to the control group that followed traditional learning methods. This is evidenced by the statistical test results, which show significant differences between the two groups in both variables (learning motivation: $p = 0.001$, academic achievement: $p = 0.005$).

Gamification can create a more interactive, enjoyable, and challenging learning environment, which in turn can enhance students' engagement and motivation to learn. Additionally, elements such as points, challenges, badges, and leaderboards can encourage students to compete and perform better. These findings support the idea that gamification can be an effective learning method to improve academic outcomes in higher education.

However, this study has limitations in terms of the sample used, so it is recommended that future research involve a broader and more diverse sample. Furthermore, future research should also explore other factors that may be influenced by gamification, such as student satisfaction and social skills. Overall, gamification can be an effective tool to improve the quality of education in higher education.

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