



The Effect of Using Gamification-Based Learning Media in Increasing Interest in Learning Physical Education State Senior High School

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Abstract

This study is motivated by the declining interest of students in participating in Physical Education, Sports, and Health (PE) learning, which is influenced by the dominance of digital technology, monotonous teaching methods, and the lack of innovative learning media. In the current digital era, students tend to prefer technology-based activities over physical activities, which has an impact on their engagement in PE learning. Therefore, innovative approaches such as gamification-based learning media are needed to create more engaging and interactive learning experiences. This study aims to determine the effect of the use of gamification-based learning media on the interest in learning Physical Education, Sports, and Health of class X students of State Senior High School 15 Bandung. The study used a quantitative approach with a pretest-posttest control group design. The research sample consisted of 85 students determined using the Slovin formula from a total population of 544 students. Data collection was carried out through a Likert scale questionnaire and analyzed using simple linear regression assisted by SPSS 17. The results showed that the use of gamification-based learning media had a significant effect on interest in learning Physical Education, Sports, and Health with a significance value of 0.000, a regression coefficient of 0.655, and an R Square value of 0.461. Thus, gamification-based learning media has proven effective in increasing interest in learning Physical Education and can be an alternative innovative learning approach in senior high schools.

How to Cite

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INTRODUCTION

Education is a conscious and planned process designed to create a conducive learning environment so that students can optimally develop their potential. As mandated in Law No. 20 of 2003 on the National Education System, education is a conscious and planned effort to create a learning environment and learning process so that students actively develop their potential, including spiritual, social, emotional, and intellectual aspects (Junaid, 2022). Within this framework, schools occupy a strategic position as a place for students to acquire the knowledge, skills, and competencies needed as provisions for life, as emphasized by Arizona (2020) that education is a process of training students which is designed in the form of learning experiences to develop knowledge, skills and competencies which can be used as capital to meet the needs of their lives and their families.

One important component of the education system that often receives insufficient attention is Physical Education, Sports, and Health (PE). Physical education is an educational method that uses physical activity to help students become more physically fit, improve motor skills, learn healthy and active lifestyle habits, develop a sporting attitude, and enhance emotional intelligence (Nugraha & Nurharsono, 2020). Furthermore, Anggara (2021) emphasizes that physical education is a teaching method that uses exercise to create holistic improvements in a person's physical, mental, and emotional well-being. Thus, physical education has goals that are inseparable from the overall goals of education, which encompass cognitive, affective, and psychomotor aspects.

However, the reality on the ground shows a shift in student behavior that has a direct impact on the implementation of physical education. In today's modern era, many students are familiar with gadgets, online games, and social media, thus preferring technology-based activities over direct physical activity. This situation raises concerns about a decline in physical activity, which, if left unchecked over the long term, could lead to obesity and various other health problems (Utami et al., 2025). Furthermore, declining student interest in sports is also a problem in implementing physical education (PE) learning in schools. Low learning interest leads to a decrease in students' desire to participate in sports activities, which ultimately hinders the achievement of quality human resources, as stated in the goals of physical education itself

(Ahmad & Okto, 2023).

Interest in learning is a key element in student success (Falata, 2024). Students with a strong interest in learning will demonstrate greater attention, a strong sense of curiosity, and active involvement in the learning process. Conversely, students with low interest tend to be passive and struggle to achieve optimal learning outcomes (Sinaga et al., 2025). This problem is further exacerbated by the lack of adequate facilities and infrastructure in some schools, which also affects students' interest in taking physical education lessons (Daya & Saputra, 2020). In addition to facility factors, monotonous and less innovative teaching techniques also hinder the creation of meaningful learning experiences for students (Sufitriyono & Nurhidayah, 2024).

To address these challenges, various innovative learning models continue to be developed. One approach that has received attention in contemporary educational literature is gamification-based learning models. Gamification is defined as the application of game elements in non-game contexts with the aim of increasing user motivation, engagement, and participation (Deterding, 2011). These elements include points, levels, badges, leaderboards, challenges, and feedback systems designed to stimulate both intrinsic and extrinsic motivation in students. Several studies have proven the effectiveness of this approach. Fadilla and Nurfadhilah (2022) concluded that the gamification learning model can increase students' motivation to learn by emphasizing interaction between students and teachers during the learning process. Meanwhile, Rahmawati et al. (2025) shows that the use of the gamification learning model is able to build active interactions between students and teachers and between students.

The application of gamification in PE learning is seen as relevant considering the characteristics of the current generation of students who are a technology native generation who have understood digital media from an early age (Surya et al., 2025). By packaging physical activity into a structured game framework, gamification is expected to create an engaging, competitive, and enjoyable learning experience while remaining oriented toward achieving physical education competencies. Redjeki (2021) also emphasized that the gamification learning model is able to improve students' cognitive, affective, and psychomotor abilities, while simultaneously encouraging the ability to work together and motivation to learn in a more sustainable manner.

Based on the description above, the researcher is interested in examining in more depth the influence of the use of gamification-based learning media on the interest in learning Physical Education (PE) among class X students at State Senior High School 15 Bandung. Although previous studies have demonstrated the effectiveness of gamification in increasing learning motivation, most of these studies are still general in nature and are not specifically focused on the context of Physical Education (PE) learning in Indonesian high schools, particularly in measuring students' interest in learning as a distinct construct. In addition, empirical evidence regarding the quantitative contribution of gamification-based learning media to learning interest in PE is still limited.

Therefore, the novelty of this study lies in its focus on the application of gamification-based learning media in the specific context of Physical Education at the senior high school level, with an emphasis on measuring students' learning interest quantitatively and identifying its contribution through a controlled experimental design. This research is expected to provide an empirical contribution to the development of more innovative and adaptive PE learning strategies to meet current developments.

METHOD

This study uses a quantitative approach with an experimental method. This quantitative approach was chosen because this study aims to measure the effect of a treatment on certain variables numerically and in a structured manner (Sugiyono, 2020). The research design used was a pretest-posttest control group design, which involves two randomly selected groups: an experimental group and a control group. Both groups were given a pretest before treatment and a posttest after treatment to determine whether there were differences in learning interest between the group using gamification-based learning media and the group not using it (Sugiyono, 2020).

This research was conducted at State Senior High School 15 Bandung located at Jalan Sarimanis No. 1, Sarijadi, Sukasari District, Bandung City, West Java, from September to December 2025. The population in this study was all 544 students of class X of State Senior High School 15 Bandung. To determine the number of representative samples, the Slovin formula was used with a margin of error of 10%, so that a minimum sample of 85 students was obtained, consisting of class X students with an average age of approximately 16 years (ranging from 15 to 16

years old) and including both male and female students. The sampling technique was carried out randomly so that each member of the population had an equal opportunity to be selected as a respondent.

There are two variables in this study. The independent variable (X) is the Use of Gamification-based Learning Media, which is measured through aspects of media display, game elements such as points, badges, and levels, interactivity, suitability of the material to PE, and ease of use. The dependent variable (Y) is Interest in Learning PE, which is measured through aspects of students' feelings of pleasure, interest, attention, and active involvement in the learning process.

The data collection technique used in this study was a questionnaire. The questionnaire was compiled using a five-level Likert scale, ranging from Strongly Disagree with a score of 1 to Strongly Agree with a score of 5. The X variable instrument consisted of seven statement items covering aspects of appearance, motivation, ease, and usefulness of gamification media in PE learning. The Y variable instrument consisted of six statement items covering aspects of students' enjoyment, interest, attention, and desire to continue participating in PE learning.

The data analysis in this study used descriptive and inferential quantitative analytical methods. Before hypothesis testing was carried out, a prerequisite test was first carried out in the form of a normality test using the One-Sample Kolmogorov-Smirnov using SPSS 17 for Windows software to ensure that the data were normally distributed. Next, hypothesis testing was carried out using a t-test with a significance level of 0.05 or 5%. The null hypothesis is accepted if the significance value is greater than 0.05 or the calculated t value is in the range of negative t table to positive t table, and rejected if the significance value is less than 0.05 or the calculated t value exceeds the calculated t table (Sugiyono, 2020).

RESULTS AND DISCUSSION

This section presents the results of data analysis obtained from 85 student respondents at State Senior High School 15 Bandung. The research results are presented sequentially, including a description of the respondent characteristics, a normality test, and the results of the test of the influence of the use of gamification-based learning media on interest in learning PE.

Data collection was conducted on 85 students who served as the research sample. Based on the results of the descriptive analysis, the characteristics of the respondents by gender, class,

and age are presented in the following **Table 1**.

Table 1. Respondent Characteristics Based on Gender

Gender	Frequency	Percentage (%)
Man	47	55.3
Woman	38	44.7
Total	85	100.0

Based on **Table 1**, the respondents were dominated by male students, amounting to 47 people or 55.3%, while female students numbered 38 people or 44.7%.

Table 2. Respondent Characteristics Based on Class

Class	Frequency	Percentage (%)
X	36	42.4
XI	26	30.6
XII	23	27.1
Total	85	100.0

Based on **Table 2**, most of the respondents came from class X as many as 36 people or 42.4%, followed by class XI as many as 26 people or 30.6%, and class XII as many as 23 people or 27.1%.

Table 3. Respondent Characteristics Based on Age

Age (Years)	Frequency	Percentage (%)
15	18	21.2
16	29	34.1
17	22	25.9
18	16	18.8
Total	85	100.0

Based on **Table 3**, the age of the respondents was mostly 16 years old, as many as 29 people or 34.1%, followed by 17 years old, as many as 22 people or 25.9%, 15 years old, as many as 18 people or 21.2%, and 18 years old, as many as 16 people or 18.8%.

Before testing the hypothesis, a normality test was first performed to ensure that the data were normally distributed. The normality test was conducted using the Kolmogorov-Smirnov and Shapiro-Wilk methods using SPSS 17 for Windows software. The results of the normality test are presented in the following **Table 4**.

Based on **Table 4**, the Shapiro-Wilk test results show a significance value of 0.126 for the variable use of gamification-based learning media and 0.243 for the variable interest in learning

physical education. Both values are greater than 0.05, thus it can be concluded that both variables are normally distributed and meet the requirements to proceed to the hypothesis testing stage. The Shapiro-Wilk test was used as the primary reference because it is considered more appropriate for samples with a number of less than 200 respondents.

Table 4. Normality Test Results

Variables	Shapiro-Wilk	df	Sig.
Use of Gamification-Based Learning Media	0.977	85	0.126
Interest in Learning Physical Education	0.981	85	0.243

The effect of gamification-based learning media on interest in learning physical education (PE) was tested using simple linear regression analysis. The results are presented in the following **Table 5**.

Table 5. Summary Model Test Results

R	R Square	Adjusted R Square	Standard Error of the Estimate
0.679	0.461	0.454	2,591

Based on **Table 5**, the R value of 0.679 was obtained, indicating a strong relationship between the use of gamification-based learning media and interest in learning PE. The R Square value of 0.461 indicates that 46.1% of the variation in interest in learning PE can be explained by the variable of the use of gamification-based learning media, while the remaining 53.9% is influenced by other factors not examined in this study.

Table 6. ANOVA Test Results

Source of Variation	F	Sig.
Regression	70,929	0,000

Based on **Table 6**, the ANOVA test results show an F value of 70.929 with a significance value of 0.000, which is less than 0.05. This indicates that the regression model used is feasible and there is a significant influence between the use of gamification-based learning media on interest in learning PE.

Table 7. Results of Regression Coefficient Test

Variables	B	t	Sig.
Constant	5,075	2,338	0.022
Gamification	0.655	8,422	0,000

Based on **Table 7**, the regression coeffi-

cient of the variable of the use of gamification-based learning media (B) is 0.655 with a t-value of 8.422 and a significance of 0.000. A significance value Senior High School than 0.05 indicates that the use of gamification-based learning media has a significant effect on the interest in learning PE of class X students of State Senior High School 15 Bandung.

The results of the study indicate that the use of gamification-based learning media significantly influences the interest in learning Physical Education (PE) of class X students of State Senior High School 15 Bandung, with a significance value of 0.000 and a regression coefficient of 0.655. This finding is in line with various previous studies that confirm the effectiveness of gamification in the learning context. Sotos-Martínez et al. (2023). In his study of 72 elementary school students, he found improvements in all motivational variables in the group using ClassDojo-based gamification, including a significant increase in intrinsic motivation, while the control group experienced no changes. This strengthens the argument that gamification is not merely a temporary attraction but can encourage deeper student engagement in the learning process.

The significant contribution of gamification to learning interest in this study, at 46.1%, can also be understood through the game elements contained within the mechanism. The use of points, badges, levels, and leaderboards has been proven to trigger students' internal drive to continue active participation. Literature on gamification in education shows that game-based systems have a positive effect on student motivation, engagement, and performance, with positive outcomes including increased participation, productivity, interest, ease of learning, and a sense of enjoyment in the learning process (Gini et al., 2025). In the context of PE, these elements become relevant because physical activities packaged in a competitive and interactive manner are more likely to attract students' attention and involvement than conventional, instructive approaches.

These findings are further supported by research specifically in physical education. A systematic review examining the application of gamification in physical education among adolescents concluded that well-implemented gamification can improve learning outcomes in a variety of settings, fostering more independent learning patterns, increasing motivation, and supporting more meaningful assessment practices for students (Sal-de-Rellán et al., 2025). These results

are relevant to the characteristics of 10th grade high school students who are in the adolescent development phase, where extrinsic motivation in the form of rewards and healthy competition can be a bridge to more stable intrinsic motivation.

Furthermore, the influence of gamification on learning interest in this study can also be linked to its ability to meet students' basic psychological needs. Sotos-Martínez et al. (2024) found a significant increase in three basic psychological needs: autonomy, competence, and social engagement in a group of students who participated in gamification-based physical education (PE) learning compared to a control group, accompanied by increased participation and better cooperation. In this study, increased student engagement through game elements is thought to help fulfill these needs, which in turn encourages the growth of a more consistent interest in learning.

On the other hand, the finding that 53.9% of the variation in learning interest is still influenced by factors other than gamification indicates that this approach does not stand alone as a single solution. Literature studies examining gamification learning media on elementary school students' learning motivation concluded that there was an increase in learning motivation due to the use of gamification media in the teaching and learning process, but its effectiveness still depends on how the media is designed and integrated into the learning process (Valentinna et al., 2024). Thus, the success of implementing gamification in physical education learning cannot be separated from the quality of the learning design, the teacher's competence in managing game-based classes, and the support of adequate facilities and infrastructure in schools.

CONCLUSION

This study demonstrates that the use of gamification-based learning media is effective in enhancing students' interest in Physical Education (PE) by creating a more engaging, interactive, and student-centered learning environment. The findings indicate that students' learning interest is not only influenced by internal factors but also by the design of instructional strategies that align with the characteristics of digital-native learners.

The novelty of this study lies in its specific focus on the application of gamification in the context of Physical Education at the senior high school level in Indonesia, with an emphasis on measuring learning interest as a distinct outcome through an experimental approach. This provides empirical evidence that strengthens the position

of gamification as an adaptive and relevant learning strategy in contemporary PE learning.

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