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**OPTIMIZING LEARNING THROUGH GAMIFICATION IN DIGITAL  
LEARNING TO IMPROVE PHYSICAL EDUCATION LEARNING  
OUTCOMES [MAXIMUM 20 WORDS]**

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**Abstract**

*Physical Education, Sports, and Health (PJOK) has a crucial role in developing students' physical fitness and motor skills. However, students' motivation in participating in PJOK learning often decreases due to less interesting teaching methods. The gamification approach in digital learning offers innovative solutions to increase student engagement. This study aims to analyze the effectiveness of gamification in digital learning on improving physical education learning outcomes. The method used is classroom action research (CAR) with a quantitative and qualitative approach. The results of the study showed that the implementation of gamification elements, such as point systems, leaderboards, and digital application-based challenges, was able to significantly increase student motivation and learning outcomes. Thus, gamification in digital learning can be an effective strategy to improve the PJOK learning experience.*

*Keywords: Gamification, Digital Learning, Physical Education, Learning Outcomes*

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## INTRODUCTION *[Times New Roman, 12 point]*

Physical Education (PJOK) aims to develop physical fitness, motor skills, and positive attitudes towards physical activity. However, in practice, many students are less motivated in participating in PJOK learning . This can be caused by various factors(Blain et al., 2022), such as conventional learning methods (Camacho-Sánchez et al., 2023), lack of variation in teaching techniques, and low student involvement in the learning process (Soriano-Pascual et al., 2022). Therefore, innovation is needed in the learning approach to improve student interest and learning outcomes.

Gamification is the application of game elements in non-game contexts, including in learning.(Oliveira et al., 2021) Elements such as points, badges, leaderboards, and challenges can increase student engagement in the learning process (Costello, 2022) (Zahara et al., 2021). With digital learning, the use of technology in PJOK becomes more flexible and interesting for students(Jastrow et al., 2022). Technology allows students to access materials anytime and anywhere (Wang et al., 2023), and increases interaction between students and teachers through digital platforms.

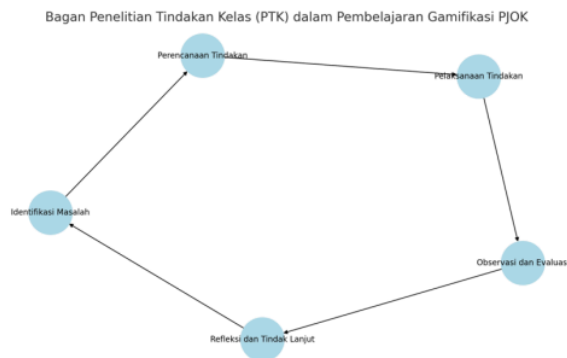
This study aims to identify the extent to which gamification in digital learning can improve PJOK learning outcomes and how to implement strategie(Issn, 2020)s (Arisman et al., 2022) in school environments.

## METHOD *[Times New Roman, 12 point]*

This research uses the classroom action research (CAR) method with a quantitative and qualitative approach. The research subjects were high school students who took PJOK subjects. Data collection was carried out through

observations, questionnaires, and learning outcomes tests before and after implementing gamification in digital learning(Clark et al., 2020).

### Classroom Action Research (CAR) Flow



Picture 1: classroom action research Flow

#### 1. Identification of problems

Initial observations on student participation and learning outcomes in PJOK.

Interviews with teachers and students to identify barriers to learning.

Analysis of learning methods that have been used and factors that cause lack of student motivation.

#### 2. Action Planning

Determine the gamification elements to be used in digital learning (e.g., points, badges, *leaderboards*, and challenges).

Choose a digital platform that supports gamification such as *Wordwall*, *ClassDojo*, *Kahoot*, or *Quizizz*.

Developing a strategy for implementing gamification in several PJOK learning sessions.

Developing interesting teaching materials with an interactive digital approach.

### 3. Implementation of Action

Implementing gamification in PJOK learning in several meetings.

Using gamification elements to increase student motivation and engagement.

Observing student behavior and responses to gamification-based learning.

Record changes in student participation and interaction.

### 4. Observation and Evaluation

Collecting data from questionnaires, interviews, and learning outcome tests .

Comparing student motivation and learning outcomes before and after gamification implementation.

Analyzing the effectiveness of gamification in improving PJOK learning outcomes.

### 5. Reflection and Follow-up

Evaluating the success of the implemented gamification strategy.

Analyze the obstacles that arise during implementation.

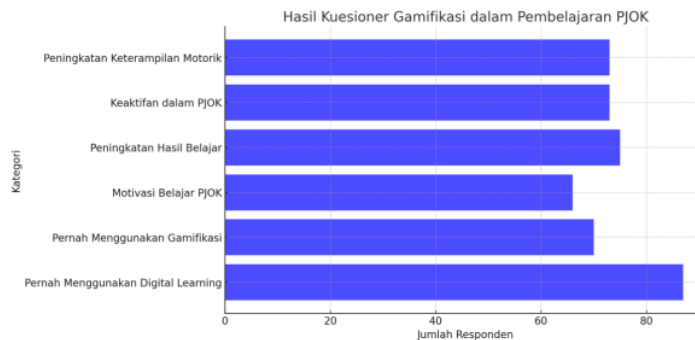
Develop recommendations for improving gamification methods in future PJOK learning.

If the results are still less than optimal, the PTK cycle can be repeated with improved strategies.

## RESULT AND DISCUSSION

The results of the study showed that the application of gamification in digital learning significantly increased student motivation and learning outcomes in PJOK. Students who were initially less enthusiastic became more active and enthusiastic in participating in learning.

It can be seen from the diagram below:



Picture 2: Diagram Result

From the diagram above it can be explained,

### 1. Participation in Learning Digital And Gamification

- **Have you ever used digital learning:** As many as 85% of respondents have used digital learning in PJOK subjects, indicating that the majority of students are familiar with digital platforms as learning aids .

- Once Using Gamification: 75% of respondents have used gamification elements in their learning, which reflects that the application of gamification in education is starting to be accepted and implemented.

## 2. Frequency of Use of Digital Learning

- Most students use digital learning with a frequency of Often (40%) and Always (20%) .
- 25% of students stated that they only sometimes use this method, while another 15% rarely or never use it. This shows that there is potential to increase the use of technology in PJOK.

## 3. Perception of Gamification Elements

- 70% of students found gamification elements such as points, leaderboards, and challenges moderately to very engaging.
- Only 10% found this element less interesting or not interesting at all, indicating that the majority of students enjoyed this method and found it helpful in their learning.

## 4. Impact of Gamification on Motivation and Learning Outcomes

- 73% of students reported that gamification was able to increase to greatly increase their motivation in learning PJOK.
- 75% of students stated that their learning outcomes improved, with 55% experiencing significant improvement .
- 74% of students became more active in PJOK classes after implementing gamification.

## 5. Improvement of Motor Skills

- 71% of students felt that their motor skills improved after the implementation of gamification, with 21% stating a very significant improvement .

## 6. Obstacles in Access to Technology

- 20% of students had no difficulty at all in accessing technology , while 30% had some difficulty .
- However, 30% of students reported experiencing significant difficulties in accessing technology , with 15% finding it seriously difficult . This suggests the need for attention to technology infrastructure and internet access for all students.

Some of the key findings in this study are:

- Increased Motivation : Gamification elements such as leaderboards and digital-based challenges make students more enthusiastic about achieving learning targets. Point-based challenges and rewards in the form of digital certificates encourage students to be more active in following learning.
- Improvement of Learning Outcomes : The test results showed an increase in students' understanding of PJOK concepts and motor skills after the implementation of gamification. Students became more aware of the concepts of sports and physical fitness in a more enjoyable way .
- Better Interaction : Digital learning allows students to learn anytime and anywhere, and facilitates interaction between teachers and students through online discussion features. Discussion forums in e-learning platforms allow students to ask questions and share experiences with classmates.

However, there are several challenges in implementing gamification in digital learning, such as limited access to technology for some students and the need for training for teachers to be able to integrate technology effectively in learning. Therefore, there needs to be a specific strategy to ensure that all students can access technology fairly and evenly.

### Conclusion and Recommendations

The application of gamification in digital learning has proven effective in improving physical education learning outcomes. By utilizing game elements, students become more motivated and active in learning. Therefore, PJOK teachers are advised to start adopting gamification strategies in their learning.

#### Conclusion

1. Gamification has proven effective in increasing student motivation and learning outcomes in PJOK. Most students are more interested, active, and have better understanding after using this method.
2. Most students are familiar with digital learning, but there is still room to improve its accessibility. Some students still experience barriers to accessing technology, which can be a barrier to the widespread implementation of gamification.
3. Gamification elements such as points, leaderboards, and digital-based challenges received positive responses from the majority of students. This shows that this approach can be used in PJOK learning more broadly.

#### Recommendation

1. Improving Teacher Training: Physical Education teachers need to be given training in managing gamification-based learning in order to maximize the potential of this method.

2. Provision of Digital Infrastructure: Schools need to improve technology access for students by providing better devices and internet connections.
3. Development of Special Platforms: The use of special applications or platforms for gamification-based PJOK can increase the effectiveness and consistency of its implementation.

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