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The Effect of Gamification Learning Model to Improve Students' Critical Thinking Skills in Elementary School Science and Social Subjects

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ABSTRACT

This study aims to examine the effect of the gamification learning model on improving students' critical thinking skills in Natural and Social Sciences (NSP) subjects in elementary schools. The research method used was pre-experiment with pretest-posttest research design. The research sample used one class as an experimental group that used the gamification learning model. The research instrument used to measure students' critical thinking skills is a validated critical thinking test. The results of the data analysis showed that there was a significant increase in students' critical thinking skills in the experimental group. This finding indicates that the application of the gamification learning model can effectively improve students' critical thinking skills in IPAS learning in elementary school. Therefore, the use of gamification in the learning process is suggested as one of the strategies to improve the quality of education and students' critical thinking skills.

INTRODUCTION

Education plays an important role in life and can change things for the better. Without education, the quality of various fields in a country will decline. Law No. 20/2003 defines education as a conscious and planned effort to develop the potential of students to be useful for society, nation and state. Education involves interaction between teachers and students, as well as a process of handing over knowledge that follows curriculum guidelines in Indonesia.

Students' motivation and interest in learning greatly affect their learning outcomes. Boredom and laziness can reduce students' motivation and interest, negatively impacting learning outcomes. Gamification is one approach that can be used to address this issue. Gamification, first introduced by Nick Pelling in 2002, is the application of game elements in learning activities to increase student motivation and engagement. Gamification makes learning more active and interactive, thus creating a conducive and enjoyable learning environment.
Critical thinking skills are very important for students and can be developed through learning that involves students actively. According to (Marisya & Sukma, 2020) critical thinking involves the ability to ask questions, answer questions, analyze arguments, solve problems, evaluate results, and make conclusions. The Gamification learning model can improve these critical thinking skills. Margetson (Kurniasari, 2018) states that game-based learning is an educational innovation that supports the development of critical thinking skills and active learning.

LITERATURE REVIEW

Definition of Gamification Learning Model

Gamification is a learning approach that uses game elements in a non-game context to increase participant motivation and engagement. (Pratomo, 2018). In education, gamification

involves applying game concepts such as points, badges, leaderboards, challenges and stories to the learning process to make it more engaging and fun. It aims to increase student participation and achievement of learning goals.

Pros of Gamification

1. **Increase Motivation**: Provide rewards and recognition that increase personal satisfaction and pride.
2. **Increases Engagement**: Game elements like challenges and competition make learning more interesting.
3. **Enhances Learning**: Game elements make the material more fun and effective.
4. **Encourages Collaboration**: Gamification systems support cooperation within a team or group.
5. **Provide Meaningful Feedback**: Rewards and feedback are directly linked to participants' actions.

Disadvantages of Gamification

1. **Potential Dependency**: The focus on rewards can distract from the learning process.
2. **Unhealthy Competitive Atmosphere**: Excessive competition can interfere with focus on learning.

Definition of Critical Thinking

Critical thinking is reflective thinking that focuses on the rational evaluation of beliefs or knowledge based on evidence and logic. John Dewey defined critical thinking as the active and careful consideration of beliefs with the reasons that support them and the conclusions that result. Edward Glaser emphasized the importance of logical reasoning in testing beliefs, while Robert Ennis called it reflective thinking that focuses on decisions about what to believe or do.

The Importance of Critical Thinking

Critical thinking is important because it helps in:

1. **Maintaining Objectivity**: Neutrally consider all aspects of the argument.
2. **Understanding other points of view**: Evaluate and develop arguments with strong support.
3. **Personal development**: Valuing learners as individuals, enabling personal growth.
4. **Preparation for Adult Life**: Equipping learners for adult life.
5. **Democratic Life**: Key to the development of democracy by understanding and solving problems rationally and critically.

METHOD

Type of Research

Grade 5 students at SDK PASUNDAN, Purwakarta Regency, participated in a pre-experiment one group design pre-post test method using non-probability sampling as the data collection approach. Pre-experimental research aims to achieve certain goals by collecting several types of data on predetermined units. In order to conduct therapy or provide treatment in the form of a *gamification* learning model, researchers and lecturers work together to carry out this research.

Research Time and Location

This research was conducted at SDK PASUNDAN which is located in Purwakarta Regency. This research was conducted in the even semester of the 2023-2024 school year.

Research Area

The study involved 26 students from grade 5 consisting of 14 girls and 12 boys.

Research Schedule

Three days were spent conducting the study. This included one day for treatment, one day for pre-test, and one day for post-test.

Methods for Collecting and Analyzing Data

Written assessments and observations were used as data collection methods; the tests were designed considering indications of critical thinking skills by Ennis in Firdaus (2019) there are 12 indicators of critical thinking skills that are grouped into 5 groups of critical thinking skills, namely providing simple explanations, building basic skills, conclusions, making further explanations, strategies and tactics.

In accordance with the implementation procedure, the cooperative learning model of picture and picture type was implemented as it should be. Teachers and students became the object of observation during this procedure. Three description questions and five multiple choice questions constituted the written test used. All indications of English mastery that had been formulated previously were in the eight exam questions. The Ministry of Education, Culture, Research and Technology of the Republic of Indonesia produced an assessment and learning guidebook in 2022, which served as the basis for the research scale used in this study. The objective method used in the assessment stage is to calculate the number of points obtained by the student divided by the number of questions, and finally multiplied by 100 to get a perfect score.

RESULT AND DISCUSSION

The research method used by researchers is *Pre-Experiment* so that this research method only uses an *experimental* class without having to use a control class. The *One Group Pre-test Post-test* design is very suitable for this research because this design has an initial test and a final test to find out more accurate research results by comparing the situation before *treatment*.

Results *Pretest Post test* critical thinking

The following are the results of the *Pretest* and *Posttest* in the experimental class, the results include the maximum value, minimum value and average

Pre-test	Post-test
52,3	85,4

The table above shows that this increase was 33.1 points, or about 63.3% of the initial score, indicating that the use of gamification in the learning process effectively improved students' critical thinking skills. The gamification learning model, which integrates game elements such as points, badges, leaderboards, challenges and stories, is proven to make the learning process more interesting and fun for learners.

These elements not only increase student engagement but also motivate them to actively participate in learning activities. For example, challenges and healthy competition through leaderboards can encourage students to think more critically in solving problems. The use of stories or scenarios in gamification also helps students understand learning materials with a clearer context, making it easier for them to analyze and evaluate information.

In addition, the immediate feedback system in gamification, such as awarding points or badges for certain achievements, provides additional motivation and reinforces critical thinking

skills. Students can see their progress in real-time, which helps them to continuously strive to improve and achieve learning goals.

Overall, these results show that gamification learning model not only makes learning more interactive and fun, but also effective in improving learners' critical thinking skills. The application of gamification in education can be a very useful strategy to facilitate more dynamic and student-centered learning, allowing them to develop skills that are essential for their future academic and life success.

CONCLUSION, LIMITATION, AND SUGGESTION

Conclusion

Based on the research, gamification learning model has a significant influence in improving students' critical thinking skills. Gamification, which involves the use of game elements such as points, badges, leaderboards, challenges and stories, creates a more engaging and interactive learning environment, which can motivate students to engage more actively in the learning process. Gamification incorporates elements of competition and rewards that can motivate students to be more engaged in learning. This increased motivation can encourage students to think more deeply and critically when completing the tasks and challenges provided. The use of stories or scenarios in gamification helps provide relevant context for the subject matter. This context makes it easier for students to understand and relate the concepts being taught to real situations, which in turn encourages them to analyze and evaluate information critically.

Challenges in gamification often involve solving complex problems. To solve these challenges, students must use their critical thinking skills, including the ability to analyze situations, consider various solutions, and make informed decisions. Immediate feedback systems in gamification, such as awarding points or badges, help students to know how far they have progressed in learning. This feedback can help students to identify their weaknesses and improve their learning strategies, which is important for the development of critical thinking skills. Many gamification models encourage collaboration and discussion between students. Through collaboration, students can share ideas, discuss solutions, and evaluate each other's arguments. These interactions are essential for practicing critical thinking skills as students learn to question, analyze, and evaluate information collectively. Gamification often requires students to seek additional information and conduct their own investigations to solve challenges. This inquiry-based learning forces students to think critically about what they are learning, how they can obtain the information, and how they can apply the knowledge in the context of the game.

In this study, the pretest results showed an average score of 52.3, while the post-test results showed an average score of 85.4 after the application of the gamification learning model. This increase of 33.1 points or about 63.3% from the initial score shows that gamification is effective in improving students' critical thinking skills. The research shows that gamification can be an effective strategy to improve students' critical thinking skills. By utilizing game elements, gamification not only makes learning more interesting but also encourages students to engage more deeply, think more critically, and develop skills that are essential for their academic success and future life. Therefore, the application of gamification in learning can be an innovative solution to overcome challenges in education and prepare students to face real-world challenges with strong critical thinking skills.

Limitation

The implementation of the research carried out is in accordance with the researcher's expectations. Researchers maximize the time as best as possible so that the research is still carried out properly.

Suggestion

Suggestions for future researchers, in the future, allocate the best possible time and use technological assistance so that it can take place optimally and optimally.

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