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The Blooket application as an interactive assessment innovation in science learning

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Abstract

This research aims to explore the use of the Blooket application as an interactive assessment innovation in Natural Sciences (IPA) learning at SMP Negeri 1 Weru. By adopting constructivism, gamification, and collaborative learning approaches, the study shows that the use of Blooket significantly improves students' learning motivation, concept understanding, and social interaction. Gamification elements such as points, leaderboards, and interactive challenges create a competitive yet fun learning atmosphere. In addition, the real-time data analysis feature makes it easier for teachers to evaluate student learning achievements appropriately. The results of this study show that Blooket is a practical and effective solution to support interactive, adaptive, and technology-based science learning.

Keywords: blooket; interactive assessment; gamification; science learning.

Introduction

Science learning at the junior high school level often faces challenges in increasing student motivation and engagement (Hakim et al., 2024; Nuraysha et al., 2024). Conventional methods that tend to be monotonous make students less enthusiastic about understanding complex concepts. In this context, technology has the potential to be an alternative solution in creating a more engaging and interactive learning experience (Hidayatullah et al., 2023; Indra et all., 2023; Pallud, 2017). One form of innovation that is now developing is the use of gamification-based applications, such as Blooket, which brings together elements of game, visualization, and competition in the learning process (Arianto et al., 2024). This has encouraged many studies to explore the effectiveness of gamification in educational settings.

Previous research has shown that gamification in education can increase student motivation, participation, and engagement (Hanafiah & Teh, 2019; Mahbubi, 2025). For example, Mahbubi (2025) found that the integration of game elements in learning was able to strengthen students' interest in the material and trigger a healthy competitive spirit in the classroom. Similar results

were also found by Sari and Alfiyan (2023), which confirms that gamification can be a practical approach to strengthening digital literacy and student participation. However, research on the effectiveness of the Blooket application, specifically in the context of science learning in junior high schools, is still limited, especially in Indonesia.

The theory underlying this research is the theory of constructivism developed by Jean Piaget and Lev Vygotsky (Bustomi et al., 2024). This theory emphasizes that learning occurs through active interaction between learners and their learning environment. In the context of Blooket apps, this theory is relevant because they allow students to participate in the learning process through interactive games actively. This is in line with the principles of constructivism that encourage students to build their knowledge through direct experience and reflection (Bada & Olusegun, 2015). In addition to constructivism, learning motivation theory also plays an important role in supporting the use of Blooket in science education.

The theory of learning motivation is also the foundation of this study. Bandura and Hall (2018) said that learning motivation is influenced by self-efficacy and success experiences. The Blooket app, with its attractive gamification design, provides an opportunity for students to experience success in answering questions or solving challenges. This experience can boost students' confidence, which in turn encourages their learning motivation to understand science concepts more deeply.

Technology-based learning theory is also an essential framework in this study. According to this theory, technology can be an effective tool to improve the quality of learning, especially in the digital age (Aisyah et al., 2024). The Blooket app, as a technology-based platform, offers features that support interactive learning, such as real-time data collection and analysis of learning outcomes. This allows teachers to provide quicker and more specific feedback so students can understand their strengths and weaknesses in learning.

Gamification theory in education is also relevant in this study. Gamification is the application of elements of gaming in non-gaming contexts, such as education, to increase engagement and motivation (Sari & Alfiyan, 2023). In the Blooket app, elements such as points, challenges, and competitions are used to create a more engaging learning experience. This theory suggests that gamification can increase student engagement, which contributes to better understanding of concepts and higher learning outcomes.

Finally, Vygotsky's collaborative learning theory is also the foundation of this research. This theory emphasizes the importance of social interaction in the learning process (Hogan & Tudge, 2014). The Blooket app allows students to collaborate on answering questions or solving challenges, either individually or in groups. These interactions not only improve students' understanding of the material but also develop their social skills, such as communication and cooperation, which are essential in science learning.

Thus, this research aims to fill this gap by exploring the application of Blooket in science learning at SMP Negeri 1 Weru. The main focus is directed on its impact on students' learning motivation, concept understanding, and social interaction. By referring to constructivism theory (Bandura & Hall, 2018), learning motivation theory (Bandura & Hall, 2018), gamification (Sari & Alfiyan,

2023), and collaborative learning (Hogan & Tudge, 2014). This research is expected to be able to provide academic contributions as well as practical recommendations for the world of education.

Method

Research Design and Approach

This study uses a qualitative research design with a descriptive approach to explore the application of Blooket in science learning at SMPN 1 Weru. This approach was chosen because it allowed researchers to deeply understand how Blooket's application can support the interactive assessment process and improve student motivation and learning outcomes. The research was conducted over a semester, focusing on grade VIII, to observe the impact of the use of apps on learning dynamics and student interaction in the classroom. The data collected included direct observation, interviews, and analysis of student learning outcomes.

The design of this research also involves integrating the Blooket application as the primary tool in formative and summative assessment. The researcher designed a series of interactive game-based learning activities using the application, which was adapted to the science curriculum. These activities include quizzes, group challenges, and individual competitions designed to measure students' understanding of science concepts such as ecosystems, energy, and materials. This approach aims to create a more engaging and interactive learning environment so that students can more actively participate in the learning process.

In addition, the approach used in this study refers to the theories of constructivism and gamification. The researcher ensured that the design of the activities in the Blooket app allowed students to build their knowledge through hands-on experience and reflection. Gamification elements such as points, leaderboards, and virtual rewards are used to increase student motivation and engagement. This approach also considers the collaborative aspect, where students are encouraged to work in groups to solve challenges, thereby strengthening their social interaction and cooperative skills in science learning.

Sample Selection and Research Subjects

The selection of samples and research subjects was carried out using a purposive sampling approach, which aims to select students who are in accordance with the research criteria (Rai & Thapa, 2015). This research focuses on grade VIII students at SMPN 1 Weru, who have participated in science learning for one semester. The selection of this class is based on the consideration that grade VIII students have a sufficient level of cognitive development to understand science concepts, as well as have relevant previous learning experience. In addition, class VIII was chosen because the science material at this level includes topics that can be integrated with the interactive features of the Blooket app.

The research subjects consisted of 30 students who were randomly selected from two parallel classes at SMPN 1 Weru. The selection of students is carried out based on specific criteria, such as the level of learning activity, academic ability, and access to technological devices. This criterion aims to ensure that the research subject has adequate basic skills to use the Blooket application effectively. In addition, science teachers who teach in the class are also involved as research subjects to provide perspectives on the implementation of applications in the learning process.

The sample selection process was carried out through consultation with classroom teachers and analysis of student academic data. The teacher provides recommendations based on observations of students' activeness in class discussions and their ability to complete previous assignments. Academic data, such as test scores and assignments, is used to ensure that the sample includes students of varying skill levels. This approach aims to obtain a representative sample so that the research results can more comprehensively reflect the impact of Blooket's application on science learning.

Blooket Application Implementation Procedure

The procedure for implementing the Blooket application in this study begins with the preparation stage, where the researchers and science teachers involved conduct training on the use of the application. The training includes an introduction to Blooket's key features, such as quiz creation, game mode settings, and learning outcome analysis. After the training is completed, the teacher designs application-based learning activities that are in accordance with the grade VIII science curriculum. This activity is designed to integrate science concepts, such as ecosystems, energy, and materials, into an engaging interactive game format. This preparation aims to ensure that the application can be used optimally in the learning process.

The implementation phase was carried out for one semester, focusing on the use of the Blooket application in formative and summative assessments. In each learning session, teachers start by giving a brief explanation of the material to be studied, followed by interactive activities using the app. Students are required to join the game through their respective devices, such as laptops or smartphones, using an access code provided by the teacher. During the game, students answer questions or complete challenges designed to measure their understanding of the material. Teachers monitor student activities in real-time through the app's dashboard to provide immediate feedback.

After the learning session is over, the teacher evaluates the results of the games obtained by students through the data analysis feature on the Blooket application. The data collected included individual scores, success rates in answering questions, and the time it took to complete the challenge. This information is used to identify students' strengths and weaknesses in understanding science concepts. In addition, teachers also hold reflective discussions with students to discuss their experiences using the app, as well as provide additional explanations if needed. This procedure is designed to ensure that the use of the Blooket app not only increases students' motivation but also supports their in-depth understanding of the material.

Data Collection and Research Instruments

Data collection in this study was carried out through several methods designed to obtain comprehensive information about the impact of using the Blooket application in science learning. The main method used is direct observation during the learning process. Researchers recorded students' interactions, participation levels, and responses to activities using the app. Observations were carried out systematically using pre-designed observation sheets, including indicators such as student involvement, ability to answer questions, and group dynamics during interactive game sessions.

In addition to observation, semi-structured interviews are also used as a method of data collection. Interviews were conducted with students and teachers to gain an in-depth perspective on their experiences using the Blooket app. Interview questions are designed to explore learning motivation, understanding of science material, and the effectiveness of applications in supporting the learning process. Interviews with students are conducted individually or in small groups, while interviews with teachers aim to understand how the Blooket app affects their teaching strategies.

The research instruments used included observation sheets, interview guides, and analysis of student learning outcomes. Learning outcome data is collected through scores obtained by students from interactive games in the Blooket application, as well as formative and summative exam scores given by teachers. The Blooket app provides data analysis features that allow researchers to access individual scores, success rates, and challenge completion times. This data is then combined with observations and interviews to provide a more complete picture of the impact of the application on student motivation and learning outcomes.

Data Analysis and Interpretation of Results

Data analysis in this study was carried out with a qualitative and quantitative approach to provide a comprehensive overview of the impact of using the Blooket application in science learning. Quantitative data was obtained from interactive game scores generated by students through the Blooket application, as well as formative and summative exam scores. This data is analyzed using descriptive statistics to identify specific patterns, such as average scores, success rates, and distribution of challenge completion time. Meanwhile, qualitative data obtained from observations and interviews were analyzed through a categorization and interpretation process to understand the experience of students and teachers in using the application.

The interpretation of the results was carried out by integrating quantitative and qualitative data to gain a deeper understanding of the effectiveness of the Blooket application in science learning. Quantitative data is used to measure the improvement in student learning outcomes, while qualitative data helps to shed light on the factors that affect student motivation and engagement. The interpretation process involves triangulating data, where findings from observations, interviews, and game score analysis are compared to ensure consistency and validity of results. In addition, the researcher also considers the learning context at SMP Negeri 1 Weru to provide a relevant and applicable interpretation.

The results of the data analysis are then compiled in the form of a report that includes key findings, such as increased learning motivation, understanding of science concepts, and students' critical thinking skills. The report also includes recommendations for further development, such as optimizing Blooket app features and integrating technology in learning. The researcher uses a reflective approach in the interpretation of the results, by engaging teachers and students to provide feedback on the findings obtained. This aims to ensure that the research results are not only academically relevant, but also provide practical benefits for the learning process in schools.

Results and Discussion

Increasing Student Learning Motivation Through the Use of the Blooket Application

The results show that the use of the Blooket application significantly increases students' learning motivation in science. Direct observation during the learning process revealed that students were more enthusiastic and actively participated in game-based activities. Gamification elements such as points, leaderboards, and interactive challenges create a healthy competitive atmosphere, encouraging students to be more enthusiastic about completing tasks. Interviews with students also confirm that they feel more motivated to understand the material due to the engaging and non-monotonous learning format.

Data obtained from interviews with teachers show that the Blooket app helps create a more dynamic learning environment where students feel encouraged to contribute actively. Teachers observe an increase in students' confidence in answering questions, especially after they successfully complete the challenges in the game. This is in line with Bandura's theory of learning motivation, which states that the experience of success can increase students' self-efficacy. Teachers also noted that students who were previously less active became more involved in class discussions after using the app.

Analysis of quantitative data from interactive game scores shows that most students experience an increase in learning motivation. The average student score increases consistently from the first session to the last session of using the app. In addition, challenge completion time also shows better efficiency, indicating that students are more focused and motivated to complete tasks quickly. These findings support the hypothesis that gamification elements in the Blooket app can drive more in-depth student engagement.

The social interaction that occurs during Blooket-based activities also contributes to increased student learning motivation. Observations show that students collaborate more often in groups to solve challenges, which creates a sense of community and support between friends. Intensive group discussions during the game help students understand the material in a more enjoyable way. Vygotsky's collaborative learning theory is relevant in this context, as social interaction proves to be an important factor in improving students' motivation and understanding.

Overall, the results show that the Blooket app not only increases students' motivation to learn, but also creates a more positive and interactive learning experience. Students feel more interested in learning science concepts because of the innovative and technology-based learning format. Teachers also acknowledge that the app provides an effective tool for measuring student motivation and engagement in real-time. Thus, the use of the Blooket application can be a practical solution to increase learning motivation in science learning at SMP Negeri 1 Weru.

The Effectiveness of Blooket Applications in Improving Understanding of Science Concepts

The results of the study show that the Blooket application is effective in improving students' understanding of science concepts. Direct observation during the learning process reveals that students are better able to answer questions correctly after using this application. Interactive features such as quizzes and game-based challenges allow students to apply their knowledge directly, thus strengthening their understanding of the material. Data from game scores showed

consistent improvements in student success rates, reflecting the effectiveness of the app in supporting the learning of science concepts.

Interviews with students confirmed that using the Blooket app helped them understand science concepts in a more engaging and easy-to-understand way. Students stated that the interactive game format made it easier for them to remember and relate to the information they had learned. Teachers also noted that students were more likely to ask questions and discuss material after using the app, showing increased interest and understanding of topics such as ecosystems, energy, and materials. This supports constructivist theories that emphasize the importance of hands-on experience in learning.

Analysis of quantitative data from game scores shows that average student scores increase significantly from the first session to the last. This improvement reflects a better understanding of the concepts of science being taught. In addition, a more efficient challenge completion time shows that students not only understand the material, but are also able to apply it quickly. These findings show that the Blooket app can be an effective tool for measuring and improving student understanding in real-time.

Social interaction during Blooket-based activities also contributes to increased understanding of science concepts. Observations show that students discuss and work together more often in groups to solve challenges. These discussions help students to share knowledge with each other and strengthen their understanding of the material. Vygotsky's theory of collaborative learning is relevant in this context, as social interaction proves to be an important factor in supporting more in-depth and meaningful learning.

Overall, the results showed that the Blooket application not only increased learning motivation but also significantly supported students' understanding of science concepts. Teachers recognize that this app provides an effective tool for identifying students' strengths and weaknesses in understanding the material. With innovative technology integration, Blooket is able to create a more interactive and immersive learning experience, thus becoming a practical solution to improve the quality of science learning at SMP Negeri 1 Weru.

Analyze Student Interactions During Blooket-Based Learning Activities

The results of the observation show that student interaction during Blooket-based learning activities takes place dynamically and collaboratively. Students are seen actively discussing in groups to solve the challenges given through the application. These group discussions not only help students understand the material better but also strengthen social connections between students. Teachers noted that students who were previously less active in learning began to show more significant participation, especially in providing ideas and solutions during the game.

Interviews with students revealed that they felt more comfortable interacting with their friends during Blooket-based activities. The competitive but still supportive game format encourages students to help each other answer questions. Students state that they find it easier to understand science material when discussing it with peers, as the explanations given are often more straightforward and relevant to their experience. This supports a collaborative learning theory that emphasizes the importance of social interaction in learning.

Quantitative data from the Blooket app shows that students who collaborate in groups have a higher success rate than students who play individually. The average group score increased significantly from the first session to the last, reflecting the effectiveness of social interaction in supporting material comprehension. In addition, challenge completion times are also more efficient in groups, showing that cooperation allows students to overcome difficulties more quickly and effectively.

Observations also revealed that student interaction during Blooket-based activities created a more inclusive learning atmosphere. Students with higher academic abilities often help their peers who have difficulty understanding the material, creating a supportive learning environment. Teachers noted that this activity boosts students' confidence, especially for those who previously felt underprivileged. These interactions not only strengthen the understanding of the material but also develop students' social skills.

Overall, the results showed that student interaction during Blooket-based learning activities had a positive impact on class dynamics and material comprehension. The collaboration that occurs during the game helps students to share knowledge and support each other in the learning process. Teachers recognize that this app provides opportunities to develop students' cooperation and communication skills, which are essential in science learning. Thus, social interaction facilitated by the Blooket application is one of the key factors in improving the quality of learning at SMP Negeri 1 Weru.

The Effects of Gamification on Student Involvement in Science Learning

The results show that the gamification element in the Blooket application significantly positively impacts student engagement in science learning. Hands-on observation reveals that features such as points, leaderboards, and interactive challenges create a competitive yet fun learning atmosphere. Students are seen to be more active in participating in learning activities, both individually and in groups. This gamification has succeeded in attracting the attention of students, especially those who were previously less motivated, thereby increasing the overall level of attendance and participation in the class.

Interviews with students confirmed that the gamification elements in the Blooket app make learning feel more engaging and less monotonous. Students stated that they felt more motivated to complete challenges because of the rewards in the form of points and positions on the leaderboard. This encourages them to focus more and try to understand the material well. Teachers also noted that students who were usually passive became more eager to contribute to class discussions, showing a significant increase in engagement.

Quantitative data from the Blooket app shows that average student scores consistently increase from the first session to the last, reflecting higher engagement in learning. In addition, a more efficient challenge completion time shows that students are not only more active but also more focused on understanding and applying science concepts. These findings support gamification theory, which states that game elements can increase student motivation and engagement in educational contexts.

Observations also reveal that the gamification elements in the Blooket app encourage more intensive social interaction among students. Students often help each other solve challenges, creating a collaborative learning environment. The group discussions that take place during the game not only increase student engagement but also strengthen their understanding of the material. Teachers noted that the classroom atmosphere became more dynamic, with students communicating more often and working together to achieve common goals.

Overall, the gamification elements in the Blooket app have proven to be effective in increasing student engagement in science learning. Students feel more motivated to participate actively because of the innovative and technology-based learning format. Teachers acknowledge that this app provides an effective tool to create a more engaging and interactive learning atmosphere. Thus, gamification is one of the strategies that can be integrated to improve the quality of science learning at SMP Negeri 1 Weru.

Evaluate Student Learning Outcomes Using Blooket Interactive Assessments

The results of the study show that the Blooket application has a positive impact on the evaluation of student learning outcomes through interactive assessments. Quantitative data from interactive game scores showed a consistent increase in average student scores from the beginning to the end of the session. Students who previously had difficulty understanding science material showed a significant increase in the success rate of answering questions. The real-time data analysis feature on the Blooket app allows teachers to identify areas that need improvement so that learning strategies can be adjusted to improve student understanding.

Interviews with teachers revealed that the use of the Blooket application simplifies the process of evaluating student learning outcomes. Teachers can monitor individual and group scores directly, providing faster and more specific feedback. This helps students to understand their strengths and weaknesses in learning science. Teachers also noted that the interactive assessment format through this app is more engaging for students, so they are more motivated to participate in the evaluation process actively.

Observations during Blooket-based learning activities show that students are more focused and involved in the evaluation process. The interactive game format encourages students to put more effort into answering questions correctly. The group discussions that take place during the game also help students to share knowledge, thus improving their understanding of the material. These interactions create a supportive learning environment where students feel more confident in dealing with assessments.

Data analysis from the Blooket app shows that students' time to complete challenges becomes more efficient as scores increase. This indicates that students not only understand the material better but are also able to apply it quickly and precisely. The teacher noted that students' ability to solve challenges showed significant cognitive development, especially in understanding complex science concepts. This data supports the effectiveness of the application in evaluating learning outcomes.

The results of this study support and expand on the findings from previous studies that stated that the use of gamification approaches in education is able to improve student motivation and

learning outcomes (Hanafiah & Teh, 2019; Mahbubi, 2025). In line with this, the application of *Blooket* in science learning not only strengthens student participation but also facilitates the creation of a fun and competitive learning atmosphere (Sari & Alfiyan, 2023). The uniqueness of this study lies in the emphasis on the integration of real-time data analysis features and the flexibility of the application in accommodating various learning styles of students, which have not been discussed much in previous research.

Overall, the results show that the Blooket application is an effective tool for evaluating student learning outcomes interactively. The technology-based assessment format not only increases students' motivation but also provides accurate data to measure their understanding of science material. Teachers admitted that this application provides a practical solution to improve the quality of evaluation of learning outcomes so that it can support the development of more effective learning strategies at SMP Negeri 1 Weru.

Conclusions

The results showed that the use of the Blooket application significantly increased student motivation, concept understanding, and involvement in science learning at SMP Negeri 1 Weru. Gamification elements such as points, leaderboards, and interactive challenges create an engaging and competitive learning atmosphere, encouraging students' active participation. Blooket is also able to accommodate various learning styles and strengthen social interaction through cooperation in solving challenges. Teachers stated that this application is effective as a technology-based evaluation and learning tool, making it a practical solution to improve the quality of science learning.

Data Availability

The datasets generated during and/or analysed during the current study are available from the corresponding author upon reasonable request.

Conflicts of Interest

All authors in this publication declare no conflict of interest regarding the title, data, location, and results of the research.

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Supplementary Materials

This study does not include any supplementary materials.

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