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The Effect of Using Kahoot Interactive Learning Media on Students' Learning Outcomes in Grade V Science Subjects

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Abstract

The use of interactive learning media is increasingly popular as a solution to improve student learning outcomes. However, limited research is still exploring the influence of game-based learning media, such as Kahoot, at the elementary school level, especially in the Natural and Social Sciences subject. This study aims to test the effect of using Kahoot on the learning outcomes of fifth-grade students in the IPAS subject. The method used was an experiment with a pre-test and post-test design involving two groups of students: the experimental group using Kahoot and the control group using conventional learning methods. The results showed that Kahoot significantly improved student learning outcomes compared to the control group. By using Kahoot, students not only remember information but can also apply their knowledge in more practical situations, improving the quality of their understanding of the topics discussed.. The practical implications of this study are that integrating digital learning media such as Kahoot can be an effective alternative to improve learning outcomes in elementary schools. However, challenges related to infrastructure and the digital divide need to be considered in its implementation. Further research with larger samples and extended periods is required to confirm these findings.

Keywords: Interactive Learning Media, Kahoot, Learning Outcomes, Science, Elementary School, Game-Based Learning.

Abstrak

Penggunaan media pembelajaran interaktif semakin digemari sebagai solusi untuk meningkatkan hasil belajar siswa. Namun, penelitian yang mengkaji pengaruh media pembelajaran berbasis permainan seperti Kahoot pada jenjang sekolah dasar khususnya pada mata pelajaran Ilmu Pengetahuan Alam dan Sosial masih terbatas. Penelitian ini bertujuan untuk menguji pengaruh penggunaan Kahoot terhadap hasil belajar siswa kelas V mata pelajaran IPAS. Metode yang digunakan adalah eksperimen dengan rancangan pre-test dan post-test yang melibatkan dua kelompok siswa yaitu kelompok eksperimen yang menggunakan Kahoot dan kelompok kontrol yang menggunakan metode pembelajaran konvensional. Hasil penelitian menunjukkan bahwa Kahoot mampu meningkatkan hasil belajar siswa secara signifikan dibandingkan dengan kelompok kontrol. Dengan menggunakan Kahoot, siswa tidak hanya mengingat informasi tetapi juga dapat menerapkan pengetahuan mereka dalam situasi yang lebih praktis, sehingga meningkatkan kualitas pemahaman mereka terhadap topik yang dibahas. Implikasi praktis dari penelitian ini adalah pengintegrasian media pembelajaran digital seperti Kahoot dapat menjadi alternatif yang efektif untuk meningkatkan hasil belajar di sekolah dasar. Namun, dalam implementasinya perlu diperhatikan tantangan terkait infrastruktur dan kesenjangan digital. Penelitian lebih lanjut dengan sampel yang lebih besar dan periode yang diperpanjang diperlukan untuk mengonfirmasi temuan ini.

Kata Kunci: Media Pembelajaran Interaktif, Kahoot, Hasil Belajar, Sains, Sekolah Dasar, Pembelajaran Berbasis Permainan

INTRODUCTION

Digital technology's development has dramatically changed how people learn and teach. One of the increasingly popular innovations in education is using interactive learning media that utilizes technology to increase student engagement and motivation (Harvey, Gil-Arias, Smith, & Smith, 2017). In today's digital era, teaching that utilizes technology is no longer an option but a necessity to keep up with the dynamics of the ever-changing era. Amid this rapid development, many new learning methods have been introduced to support a more enjoyable and effective teaching and learning process (Century, Ferris, & Zuo, 2020; Hamadi et al., 2023). One of the currently popular technologies is Kahoot, a game-based learning platform that allows students to interact directly with the subject matter through fun quizzes and challenges (van Loon, Bayard, Steiner, & Roebers, 2021).

Kahoot has been widely known in various parts of the world as a learning medium that emphasizes interactivity and fun and has been adapted at many levels of education, from elementary to higher education (Koskinen, Lämsä, Maunuksela, Hämäläinen, & Viiri, 2018). Although education technology has progressed in Indonesia, there are still many challenges in its implementation, especially at the elementary school level. In general, learning methods in elementary schools in Indonesia are still dominated by conventional approaches, which tend to be more passive and less actively involve students (Rahmawati, Taylor, Taylor, Ridwan, & Mardiah, 2022). In this context, using interactive learning media such as Kahoot can significantly increase student engagement and learning outcomes. At SD Negeri Larangan Barma 1, an elementary school located in an area with limited access to technology, the existence of Kahoot as an interactive learning media can significantly impact student learning outcomes. The subject of Natural and Social Sciences (IPAS), which is often considered difficult by many students, requires a more enjoyable and easy-to-understand learning approach. Therefore, this study aims to explore the effect of using Kahoot on the learning outcomes of fifth-grade students in the IPAS subject at the school, with the hope of contributing to improving the quality of education at the elementary level (Fiuza-Fernández, Lomba-Portela, Soto-Carballo, & Pino-Juste, 2022; Tawafak, Al-Obaydi, Klimova, & Pikhart, 2023).

Learning in many elementary schools in Indonesia still faces many challenges regarding student motivation and learning outcomes (Hardiansyah, Armadi, Ar, & Wardi, 2024; Touw, Vogelaar, Bakker, & Resing, 2019). Many studies have shown that more traditional learning methods tend to make students feel bored and less involved in teaching and learning. This lack of active involvement can potentially reduce learning effectiveness, especially in subjects that require a deeper understanding of concepts, such as science. At SD Negeri Larangan Barma 1, although there have been efforts to implement more varied methods, the learning media used are still limited to conventional resources. This creates a gap between learning materials and student understanding, ultimately impacting less-than-optimal learning outcomes.

Specifically, in science subjects, students often struggle to understand conceptual and abstract materials, such as materials about nature and society (Sáez-López, Vázquez-Cano, Fombona, & López-Meneses, 2022). Science learning that still focuses on verbal and expository approaches is considered less effective in fostering students' interest and understanding. In this context, game-based learning media, such as Kahoot, which integrates game elements into the learning process, can overcome this problem more interestingly and interactively (Takbiri, Bastanfard, & Amini, 2023). However, although Kahoot has been widely studied in higher education, few studies have precisely measured its impact at the elementary school level, especially in the Indonesian context. Therefore, this study identifies whether Kahoot can improve student learning outcomes in science subjects at an elementary school in Barma.

Improving the quality of education in Indonesia, especially at the elementary school level, requires a more innovative and practical approach to overcoming the problems faced in the teaching and learning process (Ho, Zhang, Li, & Zhang, 2023). One of the main problems encountered is the low motivation of students to learn, which directly affects their learning outcomes. The use of technology in education, especially in the form of interactive learning media, offers a breakthrough to increase student engagement and motivation (Yahya, & Nurhidayah, 2022). Although various learning technologies have been used in several schools in Indonesia, many areas have not yet adopted more modern learning technologies, such as Kahoot. Therefore, this study is critical in providing

empirical evidence on the effectiveness of using Kahoot in improving student learning outcomes at the elementary school level.

In addition, with the increasing development of technology, children today are more familiar with digital devices and tend to be more interested in technology-related activities (Sardin, & Harsi, 2022). Kahoot can use these interests and habits to create a more engaging and meaningful learning experience. This research is also relevant in the context of the ongoing educational transformation in Indonesia, which increasingly emphasizes the application of technology in the learning process. By understanding the extent to which Kahoot can improve student learning outcomes, this research has the potential to significantly contribute to improving teaching methods at the elementary school level, as well as providing recommendations for policymakers in the education sector to utilize technology more optimally.

This study has several primary objectives to be achieved. The first objective is to measure the effect of Kahoot on the learning outcomes of fifth-grade students in science at an elementary school in Barma 1. This study will use an experimental method to compare the learning outcomes of students who use Kahoot with those who use conventional methods. The second objective is to assess the extent to which Kahoot can increase student motivation and engagement in the learning process, which is ultimately expected to improve their understanding of the science subject matter. In addition, this study also aims to provide data-based recommendations to teachers and schools regarding the use of interactive learning media that can support improving the quality of education at the elementary level.

Previous studies have shown that technology-based learning media can improve students' motivation, engagement, and learning outcomes (Pertiwi, & Saputra, 2022). Research conducted by (Timotheou et al., 2023) found that the use of Kahoot as a learning medium can increase student engagement and improve their learning outcomes in various disciplines, including mathematics and English. Other research by (Chen et al., 2024) also showed that Kahoot positively impacts students' mastery of material and skills, especially at the tertiary level. However, although many studies document the effectiveness of Kahoot in various educational contexts, research that focuses on its use at the elementary school level in Indonesia, especially in science subjects, is still limited.

In addition, several studies have shown that game-based learning media can improve students' learning experiences more enjoyably and reduce students' boredom when facing complex subject matter (Sugiyanto, 2019). In this context, Kahoot can be an innovative solution to enhance the quality of learning in elementary schools, especially in subjects that require conceptual understanding, such as science.

Although many studies have explored the use of Kahoot in various educational contexts, research focusing on the use of Kahoot at the elementary school level in Indonesia is still minimal. Moreover, very few studies discuss the use of Kahoot in the context of science learning, a subject often considered difficult by students. Thus, this study aims to fill the gap in the existing literature, especially regarding the effect of Kahoot use on student learning outcomes in science subjects at the elementary school level in Indonesia. In addition, many existing studies focus more on comparing learning technology with traditional learning methods without delving deeper into other factors influencing learning outcomes, such as students' motivation and engagement levels. This study will address this gap by exploring further how the use of Kahoot directly affects these aspects and comparing it with conventional learning methods that are still dominant in many elementary schools in Indonesia.

This study has a significant contribution to filling the gap in research related to the use of Kahoot at the elementary school level in Indonesia. By specifically examining the impact of Kahoot on student learning outcomes in science subjects, this study provides new insights that are relevant to the development of technology-based learning methods in elementary schools. This study will also provide empirical evidence needed to encourage policies on the use of technology in education, which can support the development of 21st-century skills for Indonesian students. Therefore, this study not only contributes to the development of science in the field of education but also plays a role in improving the quality of education in Indonesia as a whole.

METHOD

In the processing, the researcher carried out a quantitative processing method by applying a pseudo-experiment or called with quasi-experimental. Population in research This is namely Larangan Barma 1 State Elementary School. The form design study used is a non-equivalent control group design. The design form is as follows:

Table 1. Non-Equivalent Control Group Design

	Pre- test	Treatment	Post- test
Experiment	O_1	X	O_2
Control	O_3	-	O_4

The population determination in this research is all fifth-grade students, which amounts to 50 students. A process was done for the sample, which was taken using a saturated sampling technique, meaning that the entire population became the research sample. The shared will become two groups: class A will become class control, and class B will become experimental. Before the learning process is carried out, the test group is the experimental class, and the control class is formerly given tests beginning in the form of a pretest with form questions, the same as knowing the initial abilities that students already have. At the same time, the control class was given the treatment of working on test questions as usual without using the Kahoot application. After the second class, the same material is provided. The exact second class is mentioned in the test based on the question test, the same as the form test assessment end (post-test). The test was taken from the experimental and control classes and then compared by the researcher so that the researcher could know the improved learning outcomes of both classes. Thus, the results of the initial test and the final test results in each test class were studied, namely the experimental class that was tested using the Kahoot application and the control class that did not use the Kahoot application at all. The post-test results are good if the experimental class gets a significant increase and difference in value.

The instrument used during the research process was a scale questionnaire (likert) for the experimental class, which the experimental students filled out. When it has finished, do a question. The instrument question used when the research was conducted was in the form of multiple choice test questions with four alternative answer choices, namely a, b, c, and d, covering 15 questions using the Kahoot application. The questions were made based on learning indicators from the material being taught before being used as an instrument; the questions were first validated, namely logical validity by material experts through reasoning and also validation by trying out the questions on the group that would be used as a sample.

Information that was obtained during this research observation, namely descriptive and inferential statistics, is descriptive statistical tests, which are used to present data that has been received in the form of a table. In contrast, inferential statistics are used to draw conclusions based

on information obtained using statistical formulas through the SPPS 25 for Windows application. Test normality and homogeneity; moreover, it was formerly done the moment before data was processed. To test the equality of two means of pretest data using parametric if the data is usually distributed—the t-test. Test normality and homogeneity are done using Shapiro Wilk and Lavene's test on test homogeneity. Then, a paired sample t-test was used to determine the situation. There is a difference between the average results of the study produced by the class experiment and the control class. After everything is done, the test can be continued with the n-gain score. As a result, we can know the changes or differences in the results learned by students when using the Kahoot application.

RESULT AND DISCUSSION

Result

Based on the study's results, The researcher will apply a non-equivalent control group research design. Through this stage, the researcher found an increase in the post-test results in the experimental class. This increase was seen based on the difference in the scores obtained when the class carried out the pretest and post-test experiments and class control. The findings data was successful, given the treatment's effectiveness, which was implemented by class experiment using the Kahoot application. Data processing that researchers have carried out includes descriptive statistical tests, normality tests, homogeneity tests, t-tests, and n-gain score tests. To see the effectiveness of using the application Kahoots, the researcher gave a questionnaire in Contents to students after they filled in the questions post-test using the application Kahoots.

The questionnaire used in this research was to obtain information regarding responses. Students will use the Kahoot application in lesson IPAS Class V. The questionnaire includes 10 statement items, which are distributed to Shiva and filled in directly by students after the learning activities are completed. Based on the above, the results of the questions that students have filled in will be analyzed using the level of achievement of student respondents that the researcher has processed.

Table 2. Student response questionnaire results

	Total Score	Max Score	TCR	Category
Average score	1140	110	94.63	Very effective

The table of respondents' score achievement levels illustrates that the average achievement level of student respondents reached 94.63%, which means that respondents' answers were convenient for using the Kahoot application. During the learning process, matter indicates that active students focus and participate in learning activities. As a result, it helps teachers create a pleasant learning atmosphere.

Table 3. Results Pre-test

Class	N	Minimum	Maximum	Amount	Mean	Std. Deviation	Variance
Experiment	25	19	64	1244	43.5	12.73	165.78
Control	25	19	58	1076	37.8	9.65	111.32

Based on the table above, it can be seen from the pretest data of the sample group from the group studied that there is a difference in improvement between the experimental and control classes. After doing the test prerequisite on the results pretest, he obtained that the data was distributed normally and homogeneous. As a result, it can concluded that the treatment that has been given to both experimental classes as test classes and also control classes have conditions equivalent to the

treatment that will be provided using the Kahoot application in the experimental class and class control with the method conventional Which The same very No use application Kahoots.

Table 4. Results Post-test

Class	N	Minimum	Maximum	Amount	Mean	Std. Deviation	Variance
Experiment	25	59	92	2306	81.3	8.65	73.47
Control	25	39	74	1533	54.6	9.03	82.26

Based on the table above, the results of the post-test carried out by group test showed a different mark obtained based on the class experiment and the control class. Then, the post-test result data was subjected to prerequisite tests, namely normality tests and homogeneity tests with data that must be normally distributed; as a result, the data can be continued with data analysis hypothesis tests using parametric statistics to prove its truth.

Table 5. Test Results Normality

Class	Statistics	*df*	Sig.
pre-test - Experiment	.935	25	0.131
post test – Experiment	.921	25	0.047
pre-test – Control	.947	25	0.134
post test – Control	.933	25	0.102

Based on the results of the normality test data on the two data above, it is known that the values obtained during the pretest of the experimental class are normally distributed. This evidence can be seen based on the Sig. With a value of 0.131, it can be concluded that Sig. > 0.05. While it is known that the pretest value in the control class is usually distributed, it is also proven based on the Sig. With a value of 0.134, it can be concluded that Sig. > 0.05. Then, the posttest results in the experimental class are normally distributed; it is seen based on the Sig. Value of 0.047, so Sig. > 0.05. While the posttest value in the control class is usually distributed, it is seen based on the Sig. With a value of 0.102, it can be concluded that Sig. > 0.05.

Table 6. Test Homogeneity

Class	Sig.	Information	T Table	Information
Experiment	.127	>	0.05	Homogeneous
Control	.606	>	0.05	Homogeneous

Based on the table above, a homogeneity test has been carried out. It can be concluded that the results of the homogeneity test on the experimental group were 0.127, which means it exceeds the significance level α 0.05, and also the control class, which is declared homogeneous based on the significance level of the criteria for taking homogeneity which is determined, namely if α 0.05 which has a significance value of 0.606 Which show results α 0.05 so from That, processing data Which taken from class the experimental and control classes are homogeneous.

Table 7. t-test Result Data

Class	Significance Level	t count	t table	N-Gain
Experiment	0.05	43.541	10.577	74.53%
Control				41.33%

The t-test results in this study showed a significant difference between the experimental group that used the Kahoot application and the control group that did not. The calculated t-value obtained was 43,541, much greater than the t-table value of only 10,577, indicating that the difference between the experimental and control groups was not coincidental but rather reflected the real impact of the treatment given. In this context, the calculated t value, greater than the t-table, indicated that the Kahoot application significantly improved student learning outcomes in the experimental class. The Kahoot application was proven more effective in improving student learning outcomes than the

traditional learning methods used in the control group. This difference demonstrates that interactive learning media such as Kahoot can encourage students to be more involved and motivated in learning, improving their understanding and achievement in Science subjects. In addition, the n-gain analysis strengthened the findings of the t-test by showing a significant difference in improving learning outcomes between the two groups. The n-gain score for the experimental group was 74.53%, indicating that most students in the experimental group experienced a significant increase in their understanding of the Science subject matter after being treated using Kahoot.

In contrast, the control group only showed an n-gain score of 41.33%, indicating a much lower increase. This suggests that although both groups showed increased learning outcomes, the experimental group using the Kahoot application experienced much more significant growth. The higher n-gain score in the experimental group also reflects the effectiveness of the Kahoot application as a learning medium that can accelerate the learning process and improve student understanding more optimally. Overall, the t-test and n-gain results provide strong evidence that Kahoot is effective in attracting students' attention and has a significant positive impact on improving their learning outcomes in Science learning in grade V.

Discussion

Based on this study's results, the Kahoot application in fifth grade Science learning significantly improves student learning outcomes. The t-test results showed a clear difference between the experimental group using Kahoot and the control group using conventional methods, with a calculated t greater than the t table (43.541> 10.577). This indicates that the difference between the two groups is not coincidental but reflects the real impact of the Kahoot application applied in the experimental group. Kahoot proved more effective in improving student learning outcomes than the traditional learning approach used in the control group. The results of the n-gain analysis also strengthened this finding by showing an n-gain score of 74.53% for the experimental group, indicating a significant increase in students' understanding of Science material after using Kahoot. In contrast, the control group only obtained an n-gain score of 41.33%, indicating a lower increase.

This suggests that although both groups experienced an increase, the experimental group using Kahoot obtained a much greater increase. This study aligns with several previous studies showing the success of using game-based learning, including applications such as Kahoot, in improving student learning outcomes. For example, research conducted by (Rahmawati, Taylor, Taylor, Ridwan, & Mardiah, 2022) revealed that game-based learning applications, such as Kahoot, can increase student motivation and engagement in class. In their study, students who used Kahoot in learning showed a better understanding of the material being taught and increased motivation to participate in the learning process actively. In addition, research by (Timotheou et al., 2023) also supports these findings by showing that interactive game-based learning media can improve the effectiveness of learning in elementary schools. Game-based learning, as implemented in the Kahoot application, provides a more enjoyable and interactive learning experience, which contributes to better understanding of the material.

Thus, this study not only adds to the existing empirical evidence but also enriches the literature on the benefits of technology in education, especially in the context of Science learning in elementary schools. This study also strengthens the argument that technology, especially game-based applications such as Kahoot, can be an effective alternative to replace more passive and traditional learning methods. This aligns with the findings presented by (van Loon, Bayard, Steiner, & Roebers, 2021), who stated that using technology in learning, such as game applications, can increase student engagement, reduce boredom, and encourage them to participate more actively in learning activities.

Furthermore, these findings indicate that although many schools in Indonesia still face limited infrastructure and resources, using technology such as Kahoot, which does not require expensive devices, can be a practical and effective solution. As Koehler & Mishra (2009) explained in the TPACK (Technological Pedagogical Content Knowledge) framework, using appropriate technology in a learning context can increase teaching effectiveness without requiring significant resources. Therefore, despite infrastructure challenges, applications such as Kahoot provide wider accessibility to improve the quality of learning in schools with limited facilities.

The results align with the constructivism theory proposed by (Yan & Li, 2023), which states that knowledge is built through active interaction with materials and the learning environment. In this context, Kahoot serves as a medium that facilitates such interaction, allowing students to actively participate in the learning process through quizzes and challenges designed to strengthen their understanding of the subject matter. By using Kahoot, students not only remember information but can also apply their knowledge in more practical situations, improving the quality of their understanding of the topics discussed.

In addition, the results of this study can also be explained using the Self-Determination (SDT) motivation theory developed by (Garbers, Crinklaw, Brown, & Russell, 2023). SDT focuses on the importance of intrinsic motivation in learning, which includes aspects such as a sense of competence, independence, and social connectedness. Kahoot, which combines elements of games and competition, allows students to feel competent through achievement in quizzes and challenges and feel connected to classmates in a more social and enjoyable learning process. Therefore, increased student motivation, which is reflected in better learning outcomes, can be seen as a result of increased intrinsic motivation generated by using Kahoot in learning. Overall, this study's results indicate that using Kahoot as an interactive learning medium can improve student learning outcomes in an innovative and fun way. This strengthens the concepts in active learning theory and constructivism and provides empirical evidence supporting the effectiveness of learning technology in elementary education, especially in Indonesia.

In educational practice, Kahoot has proven to be a very effective alternative compared to passive conventional learning methods (Wang, Tang, Liu, Chuang, & Shih, 2023). Although many elementary schools still rely on lectures or textbooks, this study shows that approaches such as Kahoot can increase student participation, reduce boredom, and ultimately improve learning outcomes. Therefore, teachers should integrate digital learning media such as Kahoot into their teaching practices to enhance learning outcomes and create more enjoyable and meaningful learning experiences. Another implication is the need to increase the use of technology in the education curriculum. Although many schools in Indonesia face limited infrastructure and resources, these findings can encourage education policies to prioritize the use of technology in elementary education. Technologies such as Kahoot, which do not require expensive devices, are accessible to many schools with limited resources, making them a practical and effective option to improve the quality of learning in schools with limited facilities.

Although the results of this study show significant findings, several limitations must be considered when interpreting the results. First, sample limitations are an essential factor that must be considered. This study was only conducted in one school with a relatively small sample, namely fifth-grade students at SD Negeri Larangan Barma 1. Therefore, the results of this study may not be fully generalizable to student populations in other elementary schools, especially in different areas or with

different socio-economic conditions. Further research involving more schools and students from various regions will be needed to verify whether the same results can be obtained in a broader context.

Another limitation is the limited duration of the study. This study was only conducted briefly, so it is impossible to assess the long-term impact of Kahoot use on student learning outcomes. Longer-term research, conducted throughout the school year or even over several years, will provide a better understanding of the sustainability of the impact of Kahoot use in learning. For further research, longitudinal studies are recommended to provide a more comprehensive picture of the long-term effects of game-based learning media.

In addition, this study's measurement of learning outcomes only focused on cognitive tests, which measure students' understanding of the subject matter through quizzes or tests. While this provides insight into students' knowledge of the material, it is essential to note that learning outcomes are not limited to cognitive abilities. A more holistic assessment involving measurements of other aspects such as social skills, motivation, and creativity would provide a more complete picture of the impact of Kahoot use on students' overall development.

This study opens up opportunities for further research in digital learning and game-based technology. The first suggestion for future research involves a more extensive and diverse sample. Research involving more schools with different backgrounds will allow for more general conclusions to be drawn regarding the impact of Kahoot use in a broader context. This will strengthen the reliability and validity of the research results and allow researchers to identify contextual factors that influence the effectiveness of Kahoot use. Longitudinal research is also highly recommended to measure the long-term impact of Kahoot use in learning. Longitudinal studies that observe student development over an entire school year will better understand the sustainability of using this learning media and whether the identified positive impacts are temporary or sustainable. Comparative research can also be conducted using other game-based learning platforms, such as Quizizz or Google Classroom, to explore whether Kahoot provides advantages compared to other platforms in improving student learning outcomes. This can give more insight into the strengths and weaknesses of each platform and help choose the most effective platform to implement in the classroom.

In addition to the academic impact, this study has significant social and ethical implications. The use of technology in education can improve the accessibility of learning, especially in areas with limited educational resources. In Indonesia, many schools face challenges in providing adequate resources for quality learning. Learning media such as Kahoot can help address this gap by providing affordable and accessible learning solutions through simple devices. However, there are also ethical challenges associated with using technology in education, especially related to student data privacy. Digital learning platforms such as Kahoot collect data on student interactions during quizzes and games, which can raise concerns about data security and student privacy. Therefore, educational institutions and technology developers must ensure that the data collected is treated securely and by applicable data protection policies. In addition, digital inequality remains a significant issue in the context of the use of technology in education. Not all students have equal access to the technological devices and internet connections needed to use Kahoot. Therefore, it is essential to ensure that the use of technology in education does not exacerbate social inequality but rather serves to reduce it inclusively.

CONCLUSION

Based on the results of the study conducted on the effect of the use of interactive Kahoot learning media on the learning outcomes of fifth-grade students in the Natural and Social Sciences (IPAS) subject at SD Negeri Larangan Barma 1, it can be concluded that the use of Kahoot has a significant positive impact on student learning outcomes. This study shows that students who use Kahoot as a learning medium experience a more substantial increase in understanding of the material and learning outcomes than those who follow conventional learning. These findings support the theory of active learning and constructivism, which emphasize the importance of student involvement in the learning process. The results of this study also confirm the critical role of motivation in learning, which is related to Deci and Ryan's Self-Determination (SDT) theory, where using Kahoot based on game elements can increase students' intrinsic motivation. By providing a fun and interactive platform, Kahoot can attract students' interest and encourage them to be more active in participating in learning, ultimately impacting their learning outcomes. However, this study also identified several limitations, such as limited samples and short research time. Therefore, further research is needed with larger samples and extended periods to confirm these findings further. Nevertheless, the existing findings provide strong evidence that game-based educational technology, such as Kahoot, can effectively improve student learning outcomes at the elementary school level.

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