



Application of Kahoot Online Media to Critical Thinking in Mathematics for Grade V Students of SDN 1 Tambahrejo

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ABSTRACT

The purpose of the research is to ascertain the influence of the online media Kahoot of the average results of critical thinking scores in mathematics for class 5 students. Mathematics is the main subject introduced at the elementary, middle and high school levels. This is different from conditions in the field where mathematics is one of the subjects that students are less interested in because they think that this subject is difficult. This is proven by the low average scores obtained by students. Students sometimes don't focus on working on questions and get bored quickly because they deliver material that seems monotonous. This assistance in mathematics subjects, especially critical thinking skills, was experienced by fifth grade students at SDN 1 Tambahrejo. The research type is quantitative Pre Experimental in a One Group Pretest Posttest design. Then the treatment provided is in the form of learning activities using group discussion method with Kahoot as a media. Data collection uses several techniques, namely observation, interviews, documentation and tests. In this research, the sample used was 19 fifth grade students SD N 1 Tambahrejo. The results of this research show that the average value of the pretest data is 41.37, the average posttest value shows a result of 80.58. Based on this data, students experienced an increase in the average value of 39.21. Based on the presentation of the results of the data obtained, it shows that there is an influence, namely the differentiation of average value of critical thinking in mathematics for class 5 students through the use of the online media Kahoot.

Keywords: critical thinking, elementary school, Kahoot, media

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Introduction

The presence of mathematics as a subject in educational institutions aims to instill logical and systematic thinking skills in students. Mathematics learning is an activity that provides challenges to students, namely critical thinking to solve problems or problems that have different levels, besides that mathematics can also encourage students to show their activeness through questioning activities and giving opinions to develop their mathematical critical thinking skills (Gusteti & Neviyarni, 2022). Mathematics is famous for its learning that requires understanding and critical thinking with the aim of solving the problems given. Critical thinking skills are abilities or potentials possessed by individuals that can be measured, developed, and honed (Susilawati et al., 2020). According to Ennis in Septiany (2024)



indicators of critical thinking have six criteria that are commonly abbreviated as FRISCO, namely focus, reason, inference, situation, clarity, and overview.

This is different from conditions in the field where mathematics is one of the subjects that students are less interested in because they think that this subject is difficult. This is proven by the low average results of the grades obtained by students. Students sometimes do not focus on doing problems and get bored quickly because the delivery of material seems monotonous (Suyanti et al., 2021). Inversely proportional to the ideal learning according to Jamilah (2020) There is ideal learning that can foster or encourage students to think and motivate students to be active in learning through various media intermediaries. As educators and facilitators, teachers must have the ability to choose the right media so that learning can be conveyed in an interesting and meaningful way (Zuliana et al., 2019).

Among the mathematics materials that considered difficult for elementary school students is the flat building area (Pasmawangi et al., 2023). Mathematics is introduced at the school level, one of which is to hone their critical thinking skills (Riswari, et al., 2023). Critical thinking skills are widely expressed in learning in school because they are an important component in problem solving or decisions (Lestari et al., 2023). A lot of flat building material is poured into story problems that require critical thinking skills so that students have difficulty in this. In fact, according to the opinion of Evi (2021) critical thinking is very important for students, where critical thinking among students is very important because it allows them to understand complex situations and effectively overcome existing obstacles.

Difficulties in mathematics subjects, especially in critical thinking skills, are experienced by grade 5 students of SDN 1 Tambahrejo. This is shown in the results of interviews and observations conducted by researchers in January 3 and 4, 2024. Students sometimes don't focus on working on questions and get bored quickly because they are busy with friends and the class atmosphere is less interesting. Teachers rarely use concrete media and even do not know internet media utilization as a learning tool and tend to convey material in a verbal manner so that students get bored quickly. The lack of interesting learning makes students enjoy their own world like chatting with friends, so that the absorption of material is reduced. The same thing was also found in research conducted by Riswari (2020) that is, teachers tend to still apply teacher-centered learning and do not use media in learning. Monotonous and uninteresting learning activities make students quickly bored and reduce students' focus on learning (Nuryani & Surya Abadi, 2021). This causes students to lack critical thinking skills. As a class facilitator, teachers need to develop mathematical communication so that the material can be conveyed well (Akhidah et al., 2023). Meanwhile, in reality, students still experience difficulties in dealing with questions with critical thinking skills. In the field conditions, grade 5 students at SDN 1 Tambahrejo only met several indicators of critical



thinking ability in working on the questions given by the teacher, so the grades obtained were less than satisfactory. While in reality, according to Riswari (2023) utilization media in learning itself can inspire students to learn and attract students' interest to focus more on learning. For some reason fun activities can increase students' enthusiasm for learning (Akhidah et al., 2023). In addition, the use of learning media can help teachers in conveying information from learning resources to students so that it is conveyed properly (Ermawati & Riswari, 2023). Media that is suitable for the current digital era is online-based interactive media, in addition to being in accordance with the advancement of online-based interactive media technology, it can also capture students' attention to focus more on learning (Suryani et al., 2024).

Based on the above, one of the efforts that can be made is by utilizing Kahoot's online media. According to Irwan (2019) Kahoot interactive learning media is an online page or website that has an educational nature that provides a variety of diverse and useful features are available as a medium in the learning activity. Through the Kahoot, students can participate in games and test their abilities through existing questions (Putra & Afrilia, 2020).

The research was conducted at SD N 1 Tambahrejo, with the hope that students can get acquainted with technology in the form of online applications that can benefit in critical thinking skills. Although there are facilities in the form of projectors, students have never been introduced to online learning applications such as Kahoot. In previous research conducted by Mohammad (2021), namely research on the Effectiveness of Kahoot Application Interactive Quizzes in Science Learning, namely the results of the Kahoot application interactive quizzes being effective and receiving a very good response from students in the science learning process. Then previous research conducted by Bahar (2020), focused on the effectiveness of Kahoot in learning for elementary school teachers with the result that Kahoot technology was effectively used by elementary school teachers in Sukabumi. Meanwhile, the updates carried out in this research focus on students' critical thinking skills in mathematics subjects, namely material on the area of flat shapes, especially for grade 5 students at SDN 1 Tambahrejo, then the updates are also seen in the method, namely using quantitative methods, whereas in previous research, namely using qualitative. Thus, this research is important to introduce online applications that have many benefits, one of which is improving students' critical thinking skills.

Here are some studies that show the advantages of Kahoot. Kahoot can improve student learning outcomes, namely in the form of increased grades (Irwan et al., 2019). Kahoot has an effect on student learning motivation (Wayan Pitriani et al., 2024). Kahoot learning media has an effect on increasing student learning achievement (Zuhri, 2023). In addition, according to previous research conducted by Maulidah (2020) the Kahoot application, it can also hone students' critical thinking skills. The aim of this

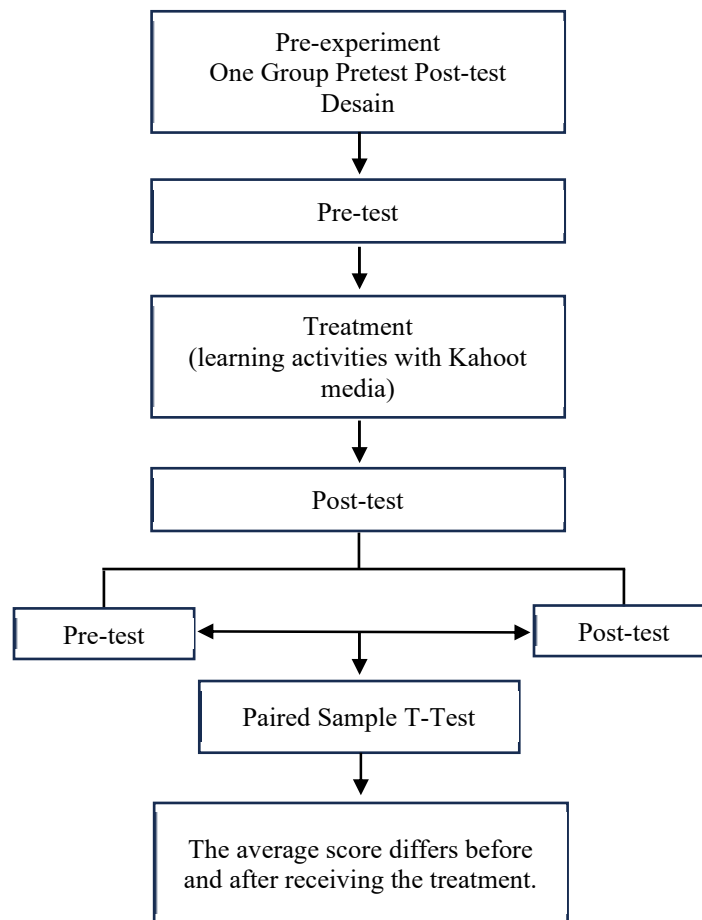


research is to determine the influence of the online media Kahoot on the average critical thinking scores in mathematics for fifth 5 students.

Methods

This research uses quantitative research and the research type is Pre-experiment in the design of One Group Pretest Post-test. This research was carried out at SDN 1 Tambahrejo during the semester of the 2023/2024 year. The number of students for class 5 of SDN 1 Tambahrejo is 19 students with 14 female students and 5 male students. The selection of the class was carried out by technique, namely based on the teacher's recommendation and class observation and grade 5 was selected as the class to be used as research.

Tabel 1. Experimental framework



Experimental research is research that has cause and effect by providing treatment or treatment that will later be tested whether or not an experimental variable is effective or not (Sahir, 2021). In this design, a pre-test is given to students to know their abilities and initial understanding, then after the pretest is



carried out, a treatment is given namely learning activities with Kahoot media. After that, the researcher gave a post-test at the same size as before to the students.

Data collection methods are one of the important components in research. The data collection method itself can be said to be a benchmark for the success of a research conducted. The strategy or process by which researchers gather the data required for their study is known as the data collecting method. (Kusumastuti et al., 2020). This research collects data using several techniques, namely observation, interviews, documentation, and tests. The research instruments themselves are observation sheets, interview sheets, documentation, and tests. The test instruments themselves are in the form of pretest and post-test, namely essay questions. For the pre-test and post-test questions themselves, they are presented with the same questions.

The design steps of the data analysis to be carried out are as follows. The first is the validity test. In this research, the type of validity is used, namely content validity or content validity. Content validity is how or to what extent a content satisfies all the content that should be related to the variable (Simbolon et al., 2023). The prerequisite test is the second step. This study's precondition testing included homogeneity and normalcy tests. The last stage is hypothesis testing. Hypothesis test of the researches is using a paired sample t test (T-Test) by utilizing the SPSS Statistics 26.0 software for windows. A hypothesis test is used to find out how the average score differs before and after receiving the treatment, namely the pretest value, and the value after the treatment is given, namely the post-test value.

Results and Discussion

Research that has done at SDN 1 Tambahrejo is on May 20-30, 2024. The subject of the research is grade 5 students of SDN 1 Tambahrejo with a total of 19 students. This research was conducted in two meetings with each meeting lasting for 3 x 35 minutes.

Learning uses the group discussion method, students are divided into several groups, namely 3 to 4 groups. Each group will later compete to complete the quiz game on the Kahoot online media provided by the teacher. Learning was carried out well and was enjoyable with students contributing directly to its continuity by using the Kahoot online media. Students look enthusiastic because of the attractive appearance of the application. Here's what the Kahoot app looks like that appeals to students.





Figure 1. Initial appearance of the website

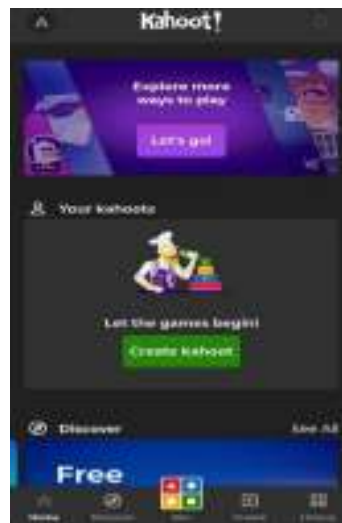


Figure 2. Display on HP



Figure 3. Question display





Figure 4. Answer choice display

The data analysis carried out in this research intends to analyse the test results of the pretest and post-test conducted at the time of the study. The results of the pretest are used as the foundation for students' initial abilities in learning mathematics. Meanwhile, the results of the post-test are used as a tool to see students' abilities after being treated in learning, namely as the application of Kahoot online media.

The Results of Normality Test

The normality test was employed in this research to find out whether or not the research's data was normally distributed. With the use of the SPSS Statistic 26 program, the Shapiro-Wilk normality test is used in this research to find the normality of the data.

Table 2. The Results of Normality Test

	Statistik	df	Sig.
Pre-test	.939	19	.256
Post-test	.957	19	.516

Considering the results of the normality test above, it is known that the sig value in the pretest is 0.256 and the sig value in the post-test shows 0.516. Based on the data, it shows that the pre-test sig value > 0.05 , namely $0.256 > 0.05$ and the post-test sig value > 0.05 , which is $0.516 > 0.05$. The concluded that the data from the pretest and post-test results obtained are distributed normally. This is used as a reference in testing the first hypothesis where the hypothesis test will be carried out using a parametric test or a Paired Sample T-Test.



The Results of Homogeneity Test

Table 3. The Results of Homogeneity Test

		Levene Statistic	df1	df2	Sig.
Pre-test post-test result	Based on Mean	1.006	1	36	.322

The SPSS Statistic 26 tool was used to analyze the homogeneity test findings. Levene Statistics has a value of 1.006 and a sig value of 0.322, as can be observed from the homogeneity test results in the table above. The data distribution has the same homogeneous group, according to a sig value of > 0.05.

The Results of Paired Sample T-Test

The hypothesis test in this study was carried out using a paired sample T-Test. This test was carried out to find whether there was an average difference in the results of the students' pretest and posttest, both before and after the treatment was given in the student's critical thinking ability test. The following is a description of the results of the paired sample t-test based on the results of the pretest and posttest values that have been obtained in the study.

Ho : There was no difference of the average math score of grade 5 students critical thinking skills after and before the implementation of online media.

Ha : There is a difference of the average score of mathematics for critical thinking skills

Table 4. The Results of Paired Sample t-Test

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test	41.37	19	10.792	2.476
	Post-test	80.58	19	8.878	2.037

The outcomes of the first output analysis test data show that the data results from paired samples are pre-test and post-test data. The average value of the pre-test data showed a result of 41.37 while the average score of the *post-test* showed a result of 80.58 with the number of sample data of 19.

Table 5. The Results of Paired Sample t-Test

	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)	
Pair 1									
	Pre-test-Post-test	-39.211	10.732	2.462	-44.383	-34.038	-15.926	18	.000

Based on the outcomes of the third output analysis test, a sig value (2-tailed) of 0.000 was obtained. So based on this data, the sig value (2-tailed) > 0.05 or 0.000 > 0.05, then it can be concluded that Ho is rejected while Ha is accepted. The data produced shows that there is a difference in the average math score



of critical thinking skills of grade 5 students after and before the implementation of the Kahoot Online media.

One element that influences learning that is enjoyable for students is interest in learning. Learning activities will be considered less fun by students if there is no innovation in learning activities. As a facilitator in the classroom, teachers must have various kinds of learning concepts that can foster students' interest in learning so that students don't easily bored in class. In accordance with the theory that states that interactive learning is having a concept where students not only pay attention to an object but also have to participate in interacting during learning by providing responses or reciprocity (Harsiwi & Arini, 2020). In this study, the interactive learning carried out is in the form of games or game quizzes. According to Riswari (2022) Games are considered a means of media that successfully stimulate students' logic and provoke students to be more active in learning, besides that games also make the learning atmosphere more relaxed because of the concept of learning while playing.

The use of interactive media kahoot itself is an effort in this study to find out whether the average students performance in mathematics learning differs, especially in honing the critical thinking skills of grade 5 students of SDN 1 Tambahrejo before and after the treatment, namely in the form of the use of interactive media kahoot. Kahoot is one of the various types of online-based interactive media can be used as a Learning medium to create interactive quizzes that are interesting for students (Ilmiyah & Sumbawati, 2021). Utilizatio of kahoot media in learning can facilitate the course of learning activities, both for teachers and students. In addition, according to Ayuningtyas (2021), Kahoot has the benefit of being able to prioritize evaluation activities in learning, namely in the form of games or quizzes that attract students' interest so that students are provoked to ikur and directly in the use of the media. In addition, the use of kahoot media can also help students in cooperation, concentration, increase comfort in learning, and motivation to learn themselves.

Mathematics learning in students' critical thinking skills begins by dividing students into several groups, 3 to 4 teams where each group must discuss to determine the name of the group which will later be included in the kahoot application when the game starts. After the group is formed, the group name is formed, then the teacher conditions the class and establishes several rules. Because this game requires high concentration, students have the task of helping each other to solve the problems listed on the projector screen of the kahoot game. At this stage, students have the opportunity to increase concentration and cooperation between groups which is important to obtain the first podium in the game, so group cooperation is needed in this activity.



Based on the research, pre-test and post-test data were obtained, and after analysis, it was shown that the use of Kahoot online media had an impact on the activities of the learning process. This is shown by the results of the pretest of students with the initials RA with a score of 33 experienced an increase in the posttest results, namely with a score of 92 where the increase in score became the highest increase in score with a difference of 59. The same thing was also experienced by students with the initials SM with the pretest result of 30 changed with the result of the posttest score of 87, where the student experienced an increase in score of 57. Meanwhile, students with the initials DNI obtained the highest scores in pretest and posttest activities, namely 62 and 96.

Table 4 displays the findings of the Paired Sample T-Test study obtained a sig value (2-tailed) of 0.000. So based on this data, the value of sig (2-tailed) > 0.05 or 0.000 > 0.05, it can be concluded that Ha is accepted and Ho is rejected. Table 3 shows the average score of the pretest data which is 41.37 while the average score of the posttest shows a result of 80.58, based on this data students experienced an average increase in scores of 39.21. From the data, the average pre-test and post-test scores before and after the treatment were found to differ, namely the use of online interactive learning media kahoot on the critical thinking skills of grade 5 elementary school students in learning activities during the research. Same thing also happened in research by Tyas (2021). In the previous study, students were more active and enthusiastic about receiving learning when applying online media kahoot so that it had a positive impact on the results of the average score of students' ability to understand concepts in the learning carried out.

Tabel 6. Critical Thinking Indicator Score Analysis

No	Critical Thinking Indicators	Question	Pre-test Score	Post-test Score	Mean (Pre-test)	Mean (Post-test)
1.	Focus	1	52	65	2,74	3,42
2.	Reason	2	46	62	2,42	3,26
3.	Inference	3	26	58	1,37	3,05
4.	Situation	4	24	58	1,26	3,05
5.	Clarity	5	22	65	1,2	3,4
6.	Overview	6	13	57	0,68	3

The analysis based on the table above related to critically thinking that after the implementation of learning using online kahoot media shows that the results of the average pre-test and post-test scores per indicator have a difference, the average post-test is higher. It is visible that the critical thinking indicators in the pre-test and post-test the highest is focus indicator and the lowest is overview indicator.

Based the presentation of table five, it shows that the highest average is in the focus indicator. Table five shows the mean pre-test score of the first indicator which is 2.74 and the average post-test score of 3.42. This is because before the treatment was given, students still experienced difficulties in identifying



the facts in the questions, as seen from some students who still experienced mistakes in doing the questions. Then after the treatment of a conducive classroom situation that makes students more focused and can find facts in the questions so that on this indicator the score obtained is quite high. A supportive classroom atmosphere can have an impact on students' focus in working on problems (Aisyah & Rahayu, 2021). According to Nuyana (2022) Students need to understand the questions first in order to be able to find facts in the questions that can later help in working on the questions.

The second indicator is reason, in this indicator the average score of the pre-test is 2.42 and the post-test is 3.26. Before the treatment was given, the students still had difficulty in finding problems in the flat building wide story problems given. In the case of the second indicator, this has similarities to the first indicator, namely the lack of understanding of students to the questions presented, so that it is difficult to find problems in the questions. Meanwhile, after being given treatment, students tend to begin to understand the problems in the questions, which can be seen in the post-test question work that includes the problem, namely in the known components. This is relevant to research by Dhamayanti (2022) Students will have difficulty finding problems in the questions if they do not understand the content of the questions. In addition, understanding the questions will have an impact on the results of the answers so that students need to read the questions carefully and concentrate (Ningtiyas et al., 2022).

The third indicator is inference, this indicator has an average pre-test score of 1.37 and post-test 3.05. Before the treatment was given in the work on the pretest questions, many students made mistakes in making ideas to make conclusions based on the questions, where the second component of the reason could be used as a support for the conclusion of the questions taken. Students who previously only wrote down their ideas, after the treatment was given, they began to be able to draw conclusions based on the problem of question. The problems contained in the questions will later be drawn conclusions to find out the next steps that must be taken by students (Ekawati et al., 2018). According to research by Cahyani (2023) Critical thinking requires an evaluation of existing facts and problems to be able to make conclusions.

The fourth indicator is the situation, in this indicator the average score of the pre-test is 1.26 and the post-test is 3.05. In the work on the pretest questions, students can already work on the questions, but many still only write down the answers without being accompanied by a flat building area formula so that it does not meet the criteria, besides that not a few students write answers by rewriting the questions in the answer column. After the treatment is given, students have begun to give answers in a series based on the questions given. In this indicator, students are directed to be able to use information in accordance



with the problem in the question (Hidayatullah et al., 2022). According to research by Octaviana (2022) Students can use the components of what is known to find the answer to the problem given.

The fifth indicator is clarity, in this indicator the average score of the pre-test is 1.2 and the post-test is 3.4. In the work on the pretest questions, students still write down the answers without being accompanied by further explanations, students tend to write the answers as they are without being supported by the search to strengthen the answers. After the treatment was given, the students gave an explanation on the answers they got, but there were still students who had not written down their answers with supportive explanations. This indicator requires word processing, namely in the form of explanations of the answers to questions that have been done by students (Zakhia et al., 2022). The clarity indicator is considered fulfilled if the student can explain further or clarify the conclusion of the answer taken (Nurmalia & Sari, 2023).

The sixth indicator is the overview, in this indicator the average score of the pre-test is 0.68 and the post-test is 3. The work on the students' pretest questions is meticulous in doing the questions where students do not re-examine the content of the questions so that they make mistakes in doing the questions, most students do not re-research the questions and answers so that they cannot achieve maximum results. After the treatment of the post-test questions was given, students tended to re-examine the results they worked on, but there were still some students who did not re-examine the questions because they thought their work was correct. Working on this indicator, students are expected to be able to re-evaluate their answers whether they have indeed been, so that they can produce satisfactory scores (Maura et al., 2020). According to research by Sari (2021) Lack of overview indicator skills can occur if students do not check the answer carefully.

The learning in this study is based on this research process when the application of kahoot media has a good or positive impact on learning activities. The learning activities went smoothly where students were very enthusiastic about participating directly in using kahoot media so that the classroom atmosphere became more lively. Learning activities are carried out with a conducive and fun classroom atmosphere. According to research by Wardana (2022) students become more active in learning after teachers utilize online kahoot media.

Presentation and discussion based on the above data that have been reviewed by the researcher along with supporting theories, the hypothesis can be figure out that states that there is an influence of the application of Kahoot online on the critically thinking of mathematics of grade 5 students of SDN 1 Tambahrejo are in the form of a difference in the average before and after the treatment is given.



Conclusion

In regard to what research that has been done, the conclusion found that there is an influence of the application of Kahoot which can be seen from the difference in the average score of mathematic critical thinking of grade 5 students of SDN 1 Tambahrejo after and before the implementation of kahoot online media with an average score increase of 39.21. From the results of the presentation of the discussion above, Kahoot online media has a positive impact on the sustainability of learning activities. In addition to students who are increasingly active in learning, the use of Kahoot online media also has an impact, namely in the form of honing and improving students' critical thinking skills. This shows that the use of modern technology is also important to be introduced to students in the learning process.

Based on the research that has been conducted by researchers, there are suggestions that can be used implementation of online Kahoot media, for teachers, the use of online interactive media based on Kahoot is recommended to be used as one of the media that can be used in learning as an alternative to support educators and learners in their studies.

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