THE IMPLEMENTATION OF KAHOOT TO IMPROVE STUDENTS' UNDERSTANDING ABILITY ON INTEGRAL MATERIALS

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ARTICLE INFO	ABSTRACT

The ability to understand mathematics is a basic ability that must be improved because there are still many students who have low understanding abilities. Kahoot learning media can improve students' mathematical understanding abilities according to the material and student characteristics. The purpose of this study is to determine the success of applying Kahoot media in improving the ability to understand mathematics in integer material for junior high school students. The method used in this research is quantitative. The data collection technique comes from the results of a description test of 4 questions regarding students' mathematical understanding abilities in integer material. Quantitative data analysis techniques were processed using descriptive and inferential statistics using Microsoft Excel and SPSS applications. This research was conducted on students at one of the MTs in West Bandung class VII as many as 22 students. The results showed that there was an increase in students' mathematical understanding abilities as indicated by the learning outcomes and student responses after the learning process took place. Students can develop their mathematical understanding skills with the help of this Kahoot media. This increase can be proven by the increase in students' pre-test and post-test results as evidenced by the calculation of the n-gain value. The results of the n-gain calculation show that the increase in students is 0.83 in the high category. This means that the application of kahoot media is successful in increasing students' mathematical understanding of integer material.

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INTRODUCTION

Mathematics is a very important learning in education and in everyday life (Kamarullah, 2017). Mathematics can help solve a problem both everyday problems and problems in the learning process (Janah, Suyitno, Rosyida, 2019). Ruseffendi (Rumita, Kusumaningsih, & Zuri, 2021) revealed that mathematics comes from thought processes related to ideas, results, and evaluation. Goes along with it Depdiknas (2014) reveals the curriculum used in schools

states that mathematics is expected to train students to think critically, actively, innovatively, and creatively. One of the activities that can measure student involvement is interaction in learning both between students and students, students and teachers, as well as interactions between students and the learning they provide. (Ricardo & Meilani, 2017). The interaction mentioned earlier can be in the form of oral or written communication (Larasati & Widyasari, 2021). Student communication with existing learning is like communicating a problem into a mathematical model (Hendriana, Sumarmo, Rohaeti, 2016).

In order for students to arrive at the ability to communicate, it is necessary to provide learning that emphasizes the basic abilities of students, namely the ability to understand mathematics (Purwasih, 2015). The ability to understand mathematics is a basic ability that students need to have (Dewi & Masruhim, 2016). When students have the ability to understand mathematics, then these students can learn and improve other understanding skills that can help in improving high-level abilities (Alan & Afriansyah, 2017). In the mastery learning process, the emphasis is on the ability to understand mathematics as a provision to improve other abilities (Putri, Sulianto, Azizah, 2019). Understanding abilities can facilitate students in solving the problems they face, because by using mathematical understanding abilities students can complete the learning process in accordance with the objectives that have been prepared (Fitria, Kartasasmita, Supianti, 2019).

Mathematics in the learning process has a specific purpose in learning. According to Wardhani (Yanti, Laswadi, Ningsih, Putra, Ulandari, 2019) revealed that the process of learning mathematics in schools is based on several learning objectives, namely (1) students are expected to be able to understand mathematical concepts, explain the interrelationships between concepts, and apply concepts accurately, efficiently and appropriately; (2) students are expected to be able to use reasoning on patterns and characteristics by manipulating in making generalizations, compiling evidence and explaining mathematical ideas and statements; (3) students are expected to be able to solve problems which include the ability to understand problems, design models, complete models, and interpret the solutions obtained; (4) students are expected to be able to communicate concepts with symbols, tables, diagrams, or graphs; (5) students are expected to have an attitude of respect for the usefulness of mathematics in life.

Based on the results of the 2018 PISA test and survey (Tohir, 2019) shows that the ability of Indonesian students and students is still relatively low. The average score obtained by Indonesian students is ranked 63 out of 69 countries. This happens because one of the students' understanding ability is still low. Mastery of students' mathematical concepts that are not optimal results in students not being able to master the material properly so that the targeted learning outcomes have not been achieved (Akuba, Puranamasari, Firdaus, 2020). Result of research Putra, Setiawan, Nurdianti, Retta, & Desi (2018) stated that 41.67% of students had low mathematical understanding abilities. Students tend to be able to understand a material if assisted by an interesting learning process (Sugiyati, 2016).

The ability of students' mathematical understanding can be increased if in the learning process they are given a learning media that can help students' mathematical understanding (Setiyani & Santi, 2019). The selection of learning media that will be given to students is adjusted to the criteria of students in each school (Larasati & Widyasari, 2021). The purpose of choosing media is adjusted to student criteria, namely to provide the right target to help improve students' mathematical understanding abilities in certain materials (Jelatu, Sariyasa, Made, 2018). If the teacher provides media without looking at the characteristics of students, they

may get inappropriate results, even students are not helped by using it (Pinis & Darmayanti, 2019).

The use of media is an alternative to help students improve their comprehension skills (Putra, 2021). Students become more interested in understanding the material if assisted by interactive media (Yaumi, 2018). There are many ways to convey media so that students' understanding abilities increase (Sholihah, 2021). The teacher can assign students to make the media themselves so they know how to use and apply it in learning, or the teacher makes the media and gives it to students as an aid in understanding learning material (Mirnawati, 2020). Students tend to be active in the learning process if given media because students do not know the media used and how to apply it in the learning process (Setiawan, Hakim, Feliestianto, 2021). The student's interest is a good thing for processing the ability to understand the material being studied (Sulistiyawati, Sholikhin, Afifah, Listiawan, 2021).

Learning media is divided into two types, namely conventional-based media and technology-based media (Mahsuri, 2019). At this time the use of both media is still being carried out, there are teachers who still use conventional media and there are also teachers who already use technological media (Suwena, 2021). Many types and forms of conventional media and technological media are adapted to the material and teacher creativity in developing media (Yulianti, Buchori, Murtianto, 2017). In technology media, there are application assistance that can be used to help create technology media or IT-based media (Syabrina & Sulistyowati, 2020). Some applications that can be used to help use media are liveworksheets, Microsoft office, geogebra, kahoot, google, and so on. (Yuwono, Ningrum, Susilo, 2021). The selection of applications to help create media can be adjusted to the learning materials, the media to be made, and the applications they master (Nurrita, 2019).

One of the media that can be used for the learning process, especially on integer material, is the kahoot interactive media. Kahoot interactive media can help the learning process be adapted to the selected material (Sulistiyawati, Sholikhin, Afifah, Listiawan, 2021). In the application can be made a media to help students understand the learning that is being studied. Based on the results of an interview with one of the mathematics teachers at junior high school, students had difficulty understanding integer material, especially when it came to number line material. Students are confused in solving problems regarding integer operations, even though they have been given number line media. In kahoot media, number lines can be made that are adjusted to the characteristics of students and which parts students find difficult to determine solving integer problems (Ntjalama, Murdiyanto, Meiliasari, 2020).

Kahoot is a very educative online page because it provides features that can be used as media in the learning process (Irwan, Luthfi, & Waldi, 2019). This learning media is the result of a Lecture quiz research project that began in 2006 at the Norwegian University of Science and Technology (NTNU), where the results of testing the initial prototype showed positive results in terms of increasing engagement, motivation, and perceptions of learning. (Wang & Lieberoth, 2016). This means that the learning media is effective for use when online learning so that learning can take place interactively (Hasiru, Badu, & Uno, 2021). Thus, students can be actively involved and are expected to be encouraged to dare to communicate their mathematical ideas (Parlindungan, Mahardika, & Yulinar, 2020).

Several studies have used kahoot media as a learning medium, according to research results Ardiansyah (2020) which reveals that the learning process using the Kahoot application media can increase student enthusiasm in learning, and students more easily understand material with interactive media. The results of other studies have also succeeded in making the kahoot educational game a support for mathematics learning in junior high schools (Sulistiyawati et

al., 2021). In addition to a more enjoyable learning process, Kahoot's interactive games can help the learning process according to the chosen learning model, so that students will be more active and effective during the learning process. (Ntjalama, Murdiyanto, Meiliasari, 2020).

Kahoot media can help students in the process of learning mathematics, but there are no researchers who have conducted research on the application of kahoot media to improve students' understanding abilities. Therefore, based on the background of the problem that has been described, a research was conducted on "Application of Kahoot Media to Improve Junior High School Students' Understanding of Integer Material". This study aims to determine the success of applying Kahoot media in improving the ability to understand mathematics in integer material for junior high school students.

METHOD

The purpose of this study is to provide an explanation of students' understanding based on the use of Kahoot media as an interactive learning medium. This research was conducted at Mts Assakinah, West Bandung Regency, involving 22 grade 7 students. The research technique used was quantitative with an experimental method. The research instrument uses 4 test questions describing the ability to understand mathematics. In order to find out the magnitude of the increase in students' mathematical understanding ability, the data was analyzed quantitatively using statistical tests which were processed in the form of test data (Murnaka & Dewi, 2018). The scores obtained from the pre-test and post-test were processed using SPSS to find the n-gain. After that, the analysis prerequisite tests were carried out, namely the normality test and homogeneity test, followed by the one-way ANOVA test. The grid for testing the ability to understand mathematics refers to indicators according to Maryati (Hendriana, Rohaeti, & Sumarmo, 2017) and the N-gain criterion refers to the according criterion Hake (Purnamawati, Ertikanto, & Suyatna, 2017). The criteria can be seen in Table 1 and Table 2.

Table 1. Mathematical Understanding Ability Indicator

No	Indicator
1.	Restate the definition of a concept
2.	Identify the relationship between the concepts learned
3.	Select, use and utilize procedures or operations that are appropriate to the problem given
4.	Solve problems based on the properties of an object being studied

Calculations are performed using the Microsoft Excel 2013 application. The gain index criteria according to Hake are as follows:

Table 2. N-Gain Criteria

No	Indicator
$g > 0,7$	High

$0{,}3 \le g \le 0{,}7$	Medium
$g < 0{,}3$	Low

Furthermore, to determine differences in increasing students' mathematical understanding abilities were analyzed using the one way ANOVA test.

RESULTS AND DISCUSSION

Results

This research was conducted through pre-test and post-test stages to determine the increase in students' understanding abilities. The test questions for students' comprehension abilities are adjusted to indicators of comprehension abilities so that the final results of students can determine the results of applying kahoot media. The pretestt is carried out during the student's initial test before being given the learning process using Kahoot media. The post-test is carried out after the learning process is given using Kahoot media. Setelah itu dilakukan uji normalitas dan uji homogenitas untuk melihat distribusi data yang diberoleh serta kehomogenan dari kedua data tersebut. Kemudian dilakukannya, the N-Gain value is then calculated to see the student's category. Berikut hasil uji normalitas, uji homogenitas, dan pehitungan N-gain.

Table 3. Result pretest, posttest and N-gain

Students Code	Pretes Result	Postest Result	Students Code	Pretes Result	Postest Result
A-1	30	60	A-12	60	90
A-2	25	93	A-13	30	80
A-3	20	80	A-14	65	90
A-4	50	90	A-15	80	76
A-5	17	85	A-16	15	66
A-6	15	72	A-17	42	87
A-7	30	92	A-18	55	92
A-8	45	90	A-19	45	90
A-9	35	87	A-20	78	100
A-10	45	90	A-21	65	90
A-11	22	83	A-22	45	88

Based on Table 3. It was found that the pretest and posttest scores of each student had increased. This can be proven by the increase in post-test scores after learning using Kahoot media. To see how much the increase is required further calculations. The calculation, namely the normality test at this stage, uses two hypotheses as a limit for the results to be accepted. One of the two hypotheses is used with the criterion that if the significance value is less than 0.05 then H_0 is accepted and H_1 is rejected, and vice versa. The following is for the hypothesis used in the following normality test:

H_0 = Data is not normally distributed
H_1 = Data is normally distributed

Table 4. Test Of Normality

	PRETES & POSTES	Statistic	df	Sig.
The Result of Student	PRETES	.130	22	.200[*]
Understanding Ability	POSTES	.172	22	.088

In the results of the normality test output above, it was found that the significance values of the pre-test and post-test values were 0.200 and 0.88. This can prove that both significance is greater than 0.05. Then value H_0 is rejected and H_1 is accepted, means that both data are normally distributed. After analyzing the normality data, a one-way ANOVA test was then carried out to ensure an increase in students' mathematical understanding abilities. There are prerequisites to see differences in ability improvement during the pre-test and post-test.

H_0 = There is no difference in increasing students' mathematical understanding abilities

H_1 = There is a difference in increasing students' mathematical understanding abilities.

Table 5 One Way Anova Test Results

ANOVA

PRETEST POSTEST RESULT

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18820.455	1	18820.455	199.854	.000
Within Groups	3955.182	42	94.171		
Total	22775.636	43			

Based on the output of the ANOVA test above, it is known that the significance value of the data is 0.00. The significance value is less than 5%, according to predetermined prerequisites, H_0 is rejected and H_1 is accepted. This means that the results of students' pre-test and post-test on mathematical understanding abilities have different improvements. Furthermore, the N-gain test was carried out to see how much the students' mathematical understanding ability increased. the results of the average n-gain value can be seen in Table 6. Below

Table 6. N-gain Calculation Results

Pretes Average	Postest Average	N-Gain	Criteria
41,4	83,2	0,83	High

Seeing the results of the increase from pre-test to post-test, it can be said that students experienced an increase in their mathematical understanding abilities. The large increase in mathematical understanding ability is also evidenced by the calculation and n-gain criteria obtained in Table 6. The data results show that the N-gain value obtained is 0.83 with high criteria. This means that students' mathematical understanding abilities increase very high with the help of Kahoot media in their learning.

Discussions

This research was conducted on 22 class VII students who would study integer material. The research process was carried out for 6 meetings where at the first meeting a pre-test was carried out regarding students' abilities in integer material, then at the second to fifth meetings the learning process was carried out using Kahoot media as a learning companion. At the last meeting students were given a posttest in the form of a description test according to the indicators of mathematical understanding ability. The final results of the students showed that students felt helped by the existence of learning media to support the learning process of integers. This is evidenced by the increased student post-test scores. Increasing students' mathematical understanding abilities can increase if the learning process is assisted with interesting and interactive media (Roswahyuliani, Rosyana, Setiawan, Kadarisma, 2022;Nurdiyanto & Hartono, 2020;Jelatu, Sariyasa, & Made, 2018).

At the first meeting, students were given pretestt questions according to indicators of mathematical understanding ability in integer material. Students feel a little confused in solving some integer problems. Actually, material for numbers has been given at elementary

school. Integer material is one of the materials that is classified as difficult for students to master both during learning in elementary schools and in secondary schools (Batubara, 2015). At the time of filling out pretestt students it is difficult to understand and communicate the problems that are available. Students are confused in completing integer operations which have actually been given the convenience of using a number line. However, with the existence of the number line students find it difficult to read the language of mathematics and communicate it. If students' mathematical understanding abilities are still low, it will have an impact on other abilities such as mathematical communication skills (Asikin & Junaedi, 2013);Dzarian, Salam, & Mustamim, 2021;Ramdani, 2013). Students will find it difficult to communicate a shape or image into ordinary language if they have not mastered their mathematical understanding skills (Fatimah, 2019).

After giving the pretestt at the first meeting, the second to fifth meetings were continued by carrying out the learning process assisted by Kahoot media. At first students were not interested in learning integers with Kahoot media that had been designed, but over time and interesting learning activities students became interested in trying and solving problems given by the teacher. In the third to fifth meetings students are used to doing Kahoot-assisted learning, so when given worksheets students need a short time to solve the problems contained in the worksheet. After students can solve the problems in the worksheet, students also boldly and confidently make presentations about the activities they have done in front of their class mates. After that the teacher tries to give problems in the form of applications and students are asked to change them into mathematical language and then solve them. At the time of solving the application problems, students did not have too much trouble communicating the questions in the language of mathematics because students already understood the basic concepts and integers according to the learning process assisted by Kahoot media. Through learning media, it can make it easier for students to improve their abilities, both basic abilities and high-level abilities (Sudiantini & Shinta, 2018).

Through these learning activities it can produce an increase in students' abilities as evidenced by increasing the pre-test and post-test scores of students' mathematical understanding abilities with whole number material. In accordance with Table 3, it can be seen that the average value obtained between the pre-test and post-test has increased by 51%, where students understand the learning process that has been carried out. This means that the learning process using Kahoot media is successful in helping students understand the concept of integers. Learning outcomes can be seen from the values, interactions, and activities of students after learning takes place if students give positive responses, students can understand and even master the learning that has been determined (Khasanah, 2016).

Based on the output results in Table 4. it was found that the significance value of the two data resulting from students' mathematical understanding abilities was normally distributed. In Table 5. A one-way ANOVA test was carried out with the aim of seeing differences in increasing students' mathematical understanding abilities. The results of the analysis can be seen through the output in Table 4. by analyzing the calculated significance values. The significance value is obtained at 0.00 which, if you look at the prerequisites, the significance value is less than 0.05, so that the initial hypothesis is rejected and the advanced hypothesis is accepted. So the value of students' mathematical understanding ability has a different increase in each indicator determined in the questions that have been given to students. This is also supported by the n-gain result data in Table 6. The data shows that the class has hasil nilai n-gain of 0.83, with these results obtained a high category. That is, students' mathematical understanding abilities in learning integers increased very high after being given a learning process with the help of Kahoot media. Through the Kahoot media students can be trained to

independently explore integer operations according to the problems that are already available (Putra & Afrilia, 2020). This is because Kahoot media is interactive media and contains activities that can improve students' understanding abilities. Increasing the level of student participation in the learning process is one of the functions of using learning media so that the objectives of learning media are to increase student activity. (Andari, 2019).

In the process of using media, students can explore how different each integer operation is. In addition, Kahoot media can train students' imagination and creativity, this can be seen in the learning process shown by students, not only knowledge has increased, but student communication in learning has increased. If students are able to improve their mathematical understanding and communication skills, these students can improve their mathematical abilities even higher to help the learning process not only on integer material. (Asih, Okyranida, & Aqil, 2020;Efendi, 2011;Robiatun, Nhoer, & Bharata, 2017).

CONCLUSION

The results of the research show that students' mathematical understanding abilities increase by learning to use Kahoot interactive media. Students can develop comprehension abilities and other mathematical abilities seen from the learning outcomes and student responses after the learning process takes place. Based on the n-gain results from the average pre-test and post-test scores, it was found to be 0.83 with high criteria. This proves that the increase in students' abilities is in the high category. On the results of the one-way ANOVA test to measure the hypothesis test of the significance value of the interaction using Kahoot learning media, a significance value of 0.00 is less than the level of significance of 0.05. Through the Kahoot media, it can be seen that students' mathematical understanding abilities have increased higher.

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