



The Use of Math Journey Learning Media to Optimize Student Collaboration Ability In Mathematics Learning Material Scales In Elementary Schools

Rizky Amalia Dhiaul Zaini^{1*} , Heru Subrata² 

¹ State University of Surabaya, Indonesia

² State University of Surabaya, Indonesia

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*Correspondence
First Author
firstauthor@email.com

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Abstract— *This study aims to determine whether there is an impact on the use of Math Journey learning media in optimizing students' collaboration skills in learning mathematics on a scale material in elementary schools. This research is a type of quasi-experimental research or commonly called quasi-experimental research. Using the One-Group Pretest-Posttest Design. In this study, two variables will be measured, namely the independent variable Math Journey learning media, and the dependent variable student collaboration skills. The sampling technique used purposive sampling with a total sample taken of 25 students. The data collection instrument in this study used student collaboration skills assessment sheets. Data analysis techniques were calculated using a paired sample t-test using the SPSS 16.0 application. The results showed that the sig (2-tailed) value of 0.000 was less than 0.05. Thus, it can be concluded that there is a significant difference in student collaboration skills before and after being given treatment, namely an increase in student collaboration skills.*

Keywords: *Learning Media; Math Journey; Collaboration Skills.*

1. INTRODUCTION

Education is an effort that is carried out consciously and planned to get a change in himself and to be able to make a person understand himself and also his environment (Hamdani & Wardani, 2019). The knowledge obtained is one of the results that have been achieved by students during the learning process (Ulhusna et al., 2020). The learning process should be made by focusing attention on students based on the learning objectives that have been made. To achieve the desired learning objectives, a collaboration between teachers and students is needed in compiling and conceptualizing a lesson (Gentry, 2012). In the learning process, students must be able to stimulate and generate curiosity, creativity, and self-confidence, as well as their willingness to learn every idea and be able to solve problems (Ulhusna et al., 2020). In addition, each student must also have the ability to be responsible and develop their abilities both independently and together with other people (Novtiar & Aripin, 2017).

At this time the ability of students in reading, writing, and arithmetic is no longer used as the only ability or skill possessed by students. 21st-century education skills that must be possessed by students include critical thinking skills, communication, collaboration, and creative abilities (Mardhiyah et al., 2021). Collaboration is a very important ability for students to have as a support for academic success and future student career success (Umayah & Riwanto, 2020). Collaboration is an effort to demonstrate the ability to work effectively and respectfully with diverse teams to achieve common goals with shared responsibility (Gusta et al., 2020).

The application of student collaboration skills in learning activities can increase knowledge to achieve learning goals (Jalmo et al., 2019). Students who work in groups

will have more knowledge. By applying student collaboration skills in elementary schools, it can make students learn how to behave fairly in dividing assignments, can learn to be responsible for completing assignments, and can apply their social skills properly and correctly (Daga, 2022). One of the learnings that is aligned with students' collaboration skills is learning mathematics. Mathematics is the science of structure, order, and relationships that have evolved from counting, measuring, and describing the shape of objects (Ulhusna et al., 2020).

However, based on observations made at an elementary school in Indonesia, in class V-B at Hidayatur Rohman Elementary School, students still experience difficulties in collaborating. This is because teachers still don't often apply group learning, and when students work in groups most of the students do assignments with only one or two people. This makes students' collaboration abilities less than optimal. And in carrying out assignments in learning mathematics on the scale material, there are still around 16 students out of the number of students in the class, namely 25 students who have not met the KKM score determined by the school. The reason is that students still feel confused about learning mathematics and the lack of teacher preparation in conceptualizing learning according to the needs of their students. In addition, in learning the teacher also does not use learning media that can support the learning process in class.

Learning to use learning media can foster student understanding and make learning in the classroom more fun (Robbins et al., 2019; Aisyah & Africal, 2022). Fun learning media is learning media that is packaged in the form of a game (Arslan-Cansever, 2019). This is in line with research conducted by (Nugrahani, 2007) that puzzle learning media made in the form of games can increase student learning interest and improve the quality of learning in the classroom. In addition (Niswara et al., 2019) also explained that the use of learning media in the form of games is also able to improve collaboration skills, critical thinking, and students' reasoning abilities. And also research conducted by (Rahmat, 2018) that the use of game book learning media that is packaged in a game also gets results that students' reading interest and learning activities increasing, students are more critical and also independent, and students build collaboration and interaction with students other.

Based on the results of the explanation above, the purpose of this research is to find out whether there is an impact on the use of Math Journey learning media in optimizing students' collaboration abilities in learning mathematics on a scale material in elementary schools.

2. METHODS

This type of research is quasi-experimental research or commonly called quasi-experimental research. Using the One-Group Pretest-Posttest Design (Hastjarjo, 2019). In this study, two variables will be measured, namely the independent variable Math Journey learning media, and the dependent variable student collaboration skills. The sampling technique used purposive sampling with a total sample taken of 25 students. The data collection instrument in this study used student collaboration skills assessment sheets. The assessment in the student collaboration skills sheet uses 6 indicators (Lu'lulilmaknun et al., 2021), including 1) the ability to work together in groups to solve problems; 2) the ability to accept opinions among group members; 3) the ability to solve problems on time; 4) the ability to exchange information between group members; 5) understand the results of group work; 6) adjust work tasks according to individual strengths and abilities.

The data analysis performed was an inferential analysis consisting of two tests, namely the prerequisite test and the hypothesis test. The prerequisite tests carried out were the normality test and uniformity test. These two tests are intended to test whether the research data is normal and homogeneous, and will later be used for hypothesis testing requirements (Ulhusna et al., 2020). Hypothesis testing was calculated using a paired sample t-test using the SPSS 16.0 application. With provisions 1) if the sig (2-tailed) value is less than 0.05 then H_0 is rejected, 2) and if the sig (2-tailed) value is greater than 0.05 then H_0 is accepted.

3. RESULTS

To find out whether there is an influence of Math Journey learning media on students' collaboration skills in learning mathematics on scale material on plans, a quasi-experimental research type was used. Student collaboration skills are measured using 6 indicators to see student collaboration skills in the learning process during the research. To analyze the data using paired sample t-test using the SPSS 16.0 application. And do a prerequisite test first, namely by carrying out a normality test using the Shapiro-Wilk and homogeneity test. The results of the normality test can be seen in table 1.

Table 1. Data Normality Test of Student Collaboration Skills

No.	Variable	Value	
		Pre Test	Post Test
1.	Mean	17.44	24.68
2.	N	25	25
3.	Std.Deviation	2.740	2.231
4.	Shapiro-Wilk	0.934	0.930
5.	Sig (2-tailed)	0.107	0.089

The data will be normally distributed if the sig (2-tailed) value is greater than 0.05. In the calculation results of the normality test, it is known that the sig (2-tailed) value is greater than 0.05, namely for the pre-test 0.107 and post-test 0.089. It can be concluded that the data on students' collaboration skills in mathematics learning, scale material on the plan is normally distributed.

Table 2. Data Results of Student Collaboration Skills Data Homogeneity Test

No	Variable	Value
1.	Levene Statistic	2.448
2.	df1	1
3.	df2	48
4.	Sig (2-tailed)	0.124

The data will be homogeneous if the sig (2-tailed) value is greater than 0.05. In the results of the calculation of the homogeneity test, it is known that the sig (2-tailed) value is greater than 0.05, namely 0.124, so it can be concluded that the data before and after being given the treatment of Math Journey learning media in mathematics learning, the scale material on the plan is homogeneous.

Table 3. Paired Sample t-test results Data on Student Collaboration Skills

No	Variable	Value
1.	Mean	7.240

2.	Std.Deviation	2.278
3.	T	15.890
4.	df	24
5.	Sig (2-tailed)	0.000

From the results of the analysis of the paired sample t-test data in table 3, the sig (2-tailed) value is 0.000, which is less than 0.05. Thus it can be concluded that there is a significant difference in student collaboration skills before and after being given treatment, namely an increase in student collaboration skills. So it can be said that the use of Math Journey learning media in learning mathematics on scale material on plans is able to improve students' collaboration skills.

4. DISCUSSION

Several ways can be done by the teacher to be able to understand students and be able to share and communicate with each other by the world of students. One of the activities that can be carried out by the teacher to foster motivation from within students to want to learn and work together is a game (Afandi, 2015). In a game, there should be an element of fun and competition in accordance with the rules to achieve goals. To win a game, a strategy, method, and effort must be needed from the players or students who are doing the game (Kurniawan, 2019).

Games can be carried out using the help of learning media, such as Math Journey learning media. Math Journey learning media is a learning media packaged in a game and made multilevel like a toll road. In the Math Journey learning media there are 3 levels where each level has questions that must be completed by each group so that the cars on the first level can go up to the last level. In using the Math Journey media, timeliness and teamwork are very necessary. Because if each group is unable to share their tasks, the group will be left behind by the other groups.

In addition, the use of learning media that is packaged in a game can build social skills, collaboration skills, encourage discussion, build an understanding of new concepts, and be able to help the process of understanding in learning mathematics (Ambarwati, 2021). The use of game media in learning mathematics can help students to deepen their understanding and reasoning. This is in line with research conducted by (Ulhusna et al., 2020; Zahroni, 2022) that the use of media and games in implementing learning is more optimal in increasing students' collaboration skills and mathematical abilities in elementary schools. The results of other studies also state that the use of game media is also able to increase student activity and teacher performance in the classroom (T. L. Dewi et al., 2017). Munajah (2020) also said that the use of game media in classroom learning can bring out students' courage and build collaboration between students to find solutions to problems given by the teacher and obtain information that can be used to foster students' new understanding.

The findings obtained from this research are that the use of Math Journey learning media can optimize students' collaboration skills. This collaborative ability can be seen when they carry out group discussions where students can share assignments with each member and respect the opinions of their friends. Although on the fourth indicator of collaboration skills, namely the ability to exchange information between members of student groups, they still need guidance from the teacher, because there are still some students who rely on their own abilities and do not inform their friends. Teachers sometimes have to lure smart students with questions such as "how do you determine the formula to be used to solve the math problem?"

In addition to being able to optimize students' collaboration skills using Math Journey learning media, it is also able to improve student learning outcomes, especially in mathematics subject matter on a scale. This can be seen from the low student learning outcomes before using the Math Journey learning media and after using the media, many students' mathematics subject scores increased according to the minimum grade standards applied at the school.

The implications for practice in using Math Journey learning media also have some positive impacts and benefits felt by students where students look enthusiastic to start learning using Math Journey media and students compete between groups to solve questions given by the teacher to determine who is the fastest. and precise. Students also feel happy when using the Math Journey learning media which is packaged in the form of a game because they have never used interesting learning media in class before. Dewi (2017) also explains that there are several benefits in using learning media including: 1) being able to standardize the delivery of material, 2) making the learning process more interesting and easy to understand, 3) being able to improve the learning process of students in class, 4) learning becomes more interactive, 5) being able to foster students' liking for the material in the learning process, and 6) eliciting active student participation in learning.

Therefore, in every lesson the teacher should memorize create learning media that is packaged in the form of a game to provide many opportunities for students to collaborate frequently and provide opportunities for students to convey mathematical ideas related to new strategies, patterns and concepts (Suryana, 2021).

The limitation in this study is that the size of the Math Journey learning media is not large enough so that students have difficulty using it and sometimes students fight over each other to use the media when a group finishes simultaneously. In addition, the meetings were held only 2 times, making the research less than optimal. And in making learning media, creativity is also needed from the teacher, so that learning media is able to attract students' attention during the learning process.

5. CONCLUSION

The purpose of this research is to find out whether there is an impact on the use of Math Journey learning media in optimizing students' collaboration abilities in learning mathematics on a scale material in elementary schools. The findings show that the use of Math Journey learning media has a positive impact on students' collaboration skills, where students look more enthusiastic in participating in learning, students are also able to respect the opinions of group members, and students are also able to work together among group members. It can also be seen that based on the results of the analysis of the paired sample t-test data, the sig (2-tailed) value is 0.000, which is less than 0.05. It can be said that there are significant differences in student collaboration skills before and after being given treatment, namely an increase in student collaboration skills. These findings can be used by teachers to use Math Journey learning to improve collaboration skills in learning other than mathematics. However, in making Math Journey learning media, creativity, time, tools and materials are needed to make media that the teacher feels is a burden. The findings from the results of this research can also be used by the teacher to design learning in the form of a game using the Math Journey learning media tool so that it can attract students' attention and not make students get bored quickly during the learning process. The limitation of this research is that the short research time means that the research can only be done in one class, namely in class IV-B at Hidayatur Rohman Elementary

School. As well as the size of the media that is not large enough to make students less flexible to use Math Journey learning media.

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AUTHOR BIOGRAPHIES

Rizky Amalia Dhiaul Zaini	Bachelor Of Elementary School Teacher Education/ Master Student State University of Surabaya Jl. Lidah Wetan, Lidah Wetan, Kec. Lakarsantri, kota Surabaya, Jawa Timur 60213, Indonesia Contact e-mail: rizky.21020@mhs.unesa.ac.id
Heru Subrata	Doctor of Education/ Lecturer at Surabaya State University State University of Surabaya Jl. Lidah Wetan, Lidah Wetan, Kec. Lakarsantri, kota Surabaya, Jawa Timur 60213, Indonesia Contact e-mail: herusubrata@unesa.ac.id
