



A Study of Process Skills in Mathematics: Elementary School and Madrasah Ibtidaiyah

Husni Sabil¹, Asrial^{2*}, Syahrial³, Rahmi⁴, Adriyan Ardi Rahman⁵

^{1,2,3,5} Faculty of Teaching and Education, Universitas Jambi, Jambi, Indonesia

⁴ Faculty of Teaching and Education, Universitas Muhammadiyah Sumatera Barat, Sumatera Barat, Indonesia

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ABSTRAK

Matematika merupakan pembelajaran yang banyak menggunakan bilangan sehingga banyak siswa yang tidak menyukai matematika. Penelitian lain juga menyatakan bahwa siswa merasa kesulitan dalam belajar matematika. Tujuan penelitian ini yaitu untuk membandingkan dan menghubungkan keterampilan siswa sekolah dasar dan siswa sekolah islam pada materi perkalian pecahan. Penelitian ini menggunakan metode kuantitatif dengan jenis asosiatif dan komperatif. Populasi pada penelitian ini sebanyak 36 siswa dimasing masing sekolah. Instrumen penelitian ini keterampilan proses siswa antara SD (Sekolah Dasar) dan MI (Madrasah Ibtidaiyah) terhadap pelajaran matematika materi perkalian pecahan. Penelitian ini menguji statistik deskriptif setelah melakukan uji statistik deskriptif dan uji asumsi berupa uji normalitas dan uji homogenitas dan uji linieritas. Hasil penelitian yaitu siswa SD dan siswa MI data dikatakan normal serta data bersifat homogen dan terdapat hubungan yang linier antara siswa SD dan siswa MI. Terdapat keterampilan proses siswa antara siswa di SD (Sekolah Dasar) dan MI (Masrasah Ibtidaiyah) dalam pembelajaran matematika materi perkalian pecahan. Dari hasil uji korelasi masing masing sekolah menunjukkan bahwa respon siswa berpengaruh terhadap keterampilan proses belajar siswa.

ABSTRACT

Mathematics is learning that uses many numbers, so that many students do not like mathematics. Other research also states that students find it difficult to learn mathematics. The purpose of this is to compare and relate the skills of elementary school students and Islamic school students to the material. This study uses quantitative methods with associative and comparative types. The population in this study were 36 students in each school. The research instrument for students' process skills between SD (Elementary School) and MI (Madrasah Ibtidaiyah) on mathematics lessons. This study tested the statistics after performing statistical tests and assumption tests in normality tests, homogeneity tests, and linearity tests. The study results are that the data of SD and MI students are said to be expected, and the data are homogeneous, and there is a linear relationship between SD and MI students. There is a process of student skills between students in SD (Elementary School) and MI (Masrasah Ibtidaiyah) in learning mathematics. The correlation test results for each school shows that student responses affect students' learning process skills.

1. INTRODUCTION

Education is a very important thing in today's modern era. Humans need education to be useful for society and the nation, thereby producing intellectual generations to increase knowledge (Dang, 2021; Faisal & Martin, 2019; Kebritchi et al., 2017). Education is a learning process for students so that they can know, evaluate and apply any knowledge gained. Education is an activity to optimize the development of potential, skills, and personal characteristics of students (Bui & Do Van Dung, 2019; Dhanalakshmi et al., 2021; Hendawi & Nosair, 2020). Education is directed at developing students' potential and skills so that they can be used in living life in society, nation and state (Jayadiputra & Karim, 2020; Kidd et al., 2020; Komalasari & Rahmat, 2019). In educators there are learners who help students to progress. 21st century learning does not only focus on memorizing material but also emphasizes learning and thinking skills, and social life skills (Kivunja, 2015; Luciana, 2020; Rusydiyah et al., 2021). Learning is not only studying theory

and facts but also studying applications in society (Churchill et al., 2013; Haviz et al., 2020; Hirschman & Wood, 2018). While studying, students have a type of learning to increase learning motivation and increase creativity (Lavi et al., 2021; Rizaldi et al., 2020; Stover et al., 2016). Learning is made based on the competence of students' needs. Students are an educational component that cannot be abandoned, because without students, the learning process cannot be carried out. Students have the ability and speed in absorbing learning materials so that more than books are needed to be able to guide students to become active in learning independently (Horasan-Doğan & Cephe, 2020; Nurtanto et al., 2019; Puspita, 2019). Learning is useful for making students gain insight and learning can be done effectively if teaching materials support learning activities (Handayani et al., 2021; Matsun et al., 2019; Sorensen, 2013). One of the learning materials is mathematics, mathematics learning is related to numbers (Hasiana & Wirastania, 2018; Rekysika & Haryanto, 2019; Suarsana, 2021).

Mathematics learning is learning that makes students think logically, can analyze data, systematically and others (Banks et al., 2018; Kowiyah & Mulyawati, 2018). In Indonesia, students have received mathematics material since elementary school (Choridah, 2013; Ngilamele et al., 2019; Widodo, 2006). Learning mathematics in the form of numbers, counting, using an abstract model (Istuningsih et al., 2018; Kartika et al., 2019; Kubilinskiene & Dagiene, 2010). Because mathematics is a learning that uses a lot of numbers so that many students do not like mathematics. Other research also states that students find it difficult to learn mathematics (Netriwati, 2018; Shofiah et al., 2018; Wahyuniar & Widyawati, 2017). Mathematics is one of the learning materials related to numbers. The ultimate goal of learning mathematics is that students can apply some mathematical material into everyday life (Darmani & Renaldi, 2018; Ratnawati et al., 2020; Setianingrum et al., 2020). In addition to studying numbers, mathematics is also a scholar who studies all of nature (Aziz et al., 2020; Kowiyah & Mulyawati, 2018; Suarsana, 2021). Mathematics lessons have been taught since elementary school, one of the first materials taught is fractions (Diantari, 2019; Moh'd et al., 2021; Rahmiati & Fahrurrozi, 2016). So that students can understand mathematics learning process skills can affect student learning outcomes.

Process skills are one way for students to understand learning. Skills are very important for students to increase creativity and knowledge through learning activities (Aziz et al., 2020; Stender et al., 2018; Vartiainen & Kumpulainen, 2020). One of the student skills is being able to acquire analytical concepts and observations (Bortnik et al., 2017; Harta et al., 2020; Mullis et al., 2012). Student skills can be obtained from learners who require students to experience for themselves, seek, try, and draw conclusions (Kruit et al., 2018; Mutlu, 2020; Solé-Llussà et al., 2019). This research is in line with previous research on student skills. However, previous studies only used variables regarding student process skills at the general school level. So that in previous research it was not known the difference in student process skills between public schools and Madrasah Ibtidaiyah (Ihsan, I. A. & Saputra, 2019; Pamungkas et al., 2019). Therefore, the purpose of this study was to compare and relate the skills of elementary school students and Islamic school students in the multiplication of fractions material. So the urgency of this study is to find out the results of students' process skills indicators regarding: observation, classification, compiling tables, and measuring. And looking for differences and relationships between elementary and MI students' process skills with fractional multiplication.

2. METHOD

This study uses quantitative associative and comparative research using a survey procedure by comparing the process skills of students from 4 classes to the material. Creswell (2002) survey research design is a procedure in quantitative research in which the research administers a survey of a sample or population for the purpose of describing the attitudes, opinions, behaviors, or characteristics of the respondents. The samples in this study were 36 students from SDN 63/I Simpang Karmio, 36 students from SDN 04/I Sungai Ruang Ilir, 36 students at MIN 3 Batang Hari and 36 students from MIS Nuru Jidad. The sampling technique used in this study used simple random sampling. Using random sampling can reduce the potential for bias in the selection of cases to be included in the sample. With the condition that random sampling is done because of the homogeneous population, the sampling frame is clear and general in nature. The reason for taking this technique is because not all samples have criteria that match the phenomenon being studied. The samples taken were students from class 5A in each school, namely SDN 63/I Simpang Karmio, SDN 04/I Sungai Ruang Ilir, MIN 3 Batang Hari, and MIS Nurul Jidad. The instrument in this research is process skills. The assessment instrument is one of the most important assessment instruments for attitudes (Suratmi et al., 2020). The collection of research data comes from research instruments that come from questionnaires. Processing skills instrument in the form of a questionnaire with 47 valid question items and this instrument uses a Likert scale. The scale consists of 4 points with a score of strongly agree is 4, agree is 3, disagree is 2, and strongly disagree is 1. Each statement is representative of each attitude

indicator. The focus of this research is on 17 dimensions of processing skills, namely observation, communication, classification, measuring, inferring, predicting, compiling tables, obtaining and processing data, analyzing experiments, making hypotheses, designing experiments, and conducting experiments. For the questionnaire grid for this research, it can be seen in table 1.

Table 1. Grid of Student Process Skills Questionnaire Instruments on Fraction Multiplication Material Materi

Variable	Indicator	No. Statement Items
Process Skills of students on the material multiplication of fractions	Observation	1,2,3
	Communication	4,5,6,7
	Classification	8,9,10,11,12
	Measure	13,14,15
	Conclusion	16,17,18,19
	Prediction	20,21,22,23,24
	Arrange Table	25,26,27
	Obtaining and Processing Data	28,29,30,31
	Experimental Analysis	32,33,34,35
	Creating a Hypothesis	36,37,38
	Designing Experiments	39,40,41,42,43
	Doing Experiments	44,45,46,47
	Number of Statements	

Because the student's process skills questionnaire on the material of multiplication of fractions uses a Likert scale, there is an interval for each indicator that is tested. The intervals for the indicators tested can be seen in table 2.

Table 2. Category of Student Process Skills Against Fraction Multiplication Material

Category	Indicator Interval			
	Observation	Classification	Arrange Table	Measure
Very Not Good	3.0-5.25	5.0-8.75	3.0-5.25	3.0-5.25
Not good	5.26-7.50	8.76-12.5	5.26-7.50	5.26-7.50
Good	7.51-9.75	12.6-16.25	7.51-9.75	7.51-9.75
Very good	9.76-12.00	16.26-20,0	9.76-12.00	9.76-12.00

The Likert scale used in this study were: 1 (very not good), 2 (not good), 3 (good), 4 (very good) with 48 questions about students' processing skills on multiplication of fractions material. The results of students' questionnaire answers regarding processing skills were analyzed using descriptive statistics. By using this type of associative research to determine the relationship or type of the variables used. Therefore, differential statistics are used with assumption tests consisting of normality, linearity and homogeneity tests as well as hypothesis testing, namely T test and correlation test. The nomarality test aims to determine whether a data can be said to be normal or not, while the homogeneous test aims to determine whether the data of the two samples is homogeneous or not. The normality test was obtained from the result data in a normally distributed population with the condition that the sig value was greater than 0.05. The first step in this research is to determine the normality and homogeneity of a data using normality test and homogeneity test. Normality test and homogeny test if the result data in the population is normally distributed and homogeneous, then the condition is that the sig value is greater than 0.05.

3. RESULT AND DISCUSSION

Result

The results obtained from the school data of SDN 63/I Simpang Karmio, SDN 04/I Sungai Ruang Iilir, MIN 3 Batang Hari, and MIS Nurul Jidad for grade 5A are as follows. The description of the process skills of SD/MI students on the multiplication of fractions material on the Observation indicator. Based on the results of data analysis, the process skills of SD/MI students with observation indicators found that on average many students chose the good and very good categories with the percentage for SD N 63 38.9% good and 30.6% very good, SD N 04 38.9% good and 33.4% very good, MIN 3 41.7% good and 27.8% very good, MIS Nurul Jidad 36.1% good and 33.4% very good. Furthermore, the process skills of SD/MI students

with measuring indicators. Based on the results of data analysis, the process skills of SD/MI students with measuring indicators found that the average number of students chose the good category with the percentage for SD N 63 47.2% good, SD N 04 36.1% good, MIN 3 30.5% good, MIS Nurul Jadid 36.1% good.

Furthermore, the process skills of SD/MI students with indicators compose a table Based on the results of data analysis, the process skills of SD/MI students with indicators in compiling the table, it was found that on average many students chose the bad and good categories with the percentage for SD N 63 30.6% not good and 33.3% good, SD N 04 33.3% not good and 33.3% good, MIN 3 33.3% is not good and 41.7% is good, MIS Nurul Jadid 33.3% is not good and 33.3% is good. Furthermore, the process skills of SD/MI students with classification indicators. Based on the results of data analysis, the process skills of SD/MI students with indicators in compiling the table showed that the average number of students chose good with the percentage for SD N 63 25.8% not good, SD N 04 27.2% good, MIN 3 30% good, MIS Nurul Jadid 28.6% good. The data is normally distributed as seen from the significance value, if the significance value is > 0.05 . The results of the normality test are shown in the following table 3. The normality test for elementary/MI students' process skills on the multiplication of fractions is described in the following table 3.

Table 3. Normality Test of SD/MI students' process skills on multiplication of fractions.

School name	N	Statistik	Sig.
SDN 63/I Simpang Karmio	36	0,978	0,675
SDN 04/I Sungai Ruang Ilir	36	0,942	0,753
MIN 3 Batang Hari	36	0,940	0,668
MIS Nurul Jidad	36	0,983	0,724

Based on the results of table 8, it was obtained that the normality test with the Kolmogorov-Smirnov test had a significance value of > 0.05 , so it can be concluded that the data is normally distributed. This test is carried out in order to find out whether the x and y data are homohen or not. The requirement in this test is that if the significance value is > 0.05 , it can be said that the x and y data are homogeneous (same). If the significance value is < 0.05 then the data is not homogeneous (not the same). The results obtained are shown in the table. The homogeneity test of elementary/MI students' process skills on the multiplication of fractions is described in the following table.

Table 4. Test of homogeneity of Elementary/MI Students' Process Skills on The Multiplication Of Fractions Material

School name	N	F	Sig.
SDN 63/I Simpang Karmio	36	0,128	0,751
SDN 04/I Sungai Ruang Ilir	36		
MIN 3 Batang Hari	36	0,098	0,453
MIS Nurul Jidad	36		

Based on table 9 obtained, the results of the homogeneity test obtained are a significance value of 0.751 for SD and 0.453 for MI that has met the requirements > 0.05 , it can be concluded that the two variables are homogeneous. This test is carried out in order to see a linear relationship between two or more variables. The requirements for this test, if the significance value is > 0.05 . The results obtained are shown in the table. The linearity test of elementary/MI students' process skills on the multiplication of fractions is described in the following table.

Table 5. Linearity test of elementary/MI students' process skills on multiplication of fractions.

School Level	School	N	F	Sig.
SD	SDN 63/I Simpang Karmio	36	1,578	0,241
	SDN 04/I Sungai Ruang Ilir	36		
MI	MIN 3 Batang Hari	36	1,051	0,379
	MIS Nurul Jidad	36		

Based on table 10 obtained, the results of the linearity test obtained are a significance value of 0.241 for SD and 0.379 for MI that has met the requirements > 0.05 , so it can be concluded that there is a linear relationship between the process skills of elementary school students and MI students on the material multiplication of fractions. In this test, it is carried out in order to know the difference between the variables

on the multiplication of fractions material. The conditions in this test are if the significance value is > 0.05 , it can be said that these variables have differences. If the significance value is < 0.05 , then the variable does not have a significant difference. From the data, it can be seen that there are differences in student process skills in each school. This is evidenced by the value of sig (2-tailed) > 0.05 . In this test, it is carried out in order to determine the relationship of variables to the material of multiplication of fractions. Conditions in this test if the significance value > 0.05 then it can be said that the variable has no relationship. If the significance value is < 0.05 , then the variable has a significant relationship. The results obtained are shown in the table. The correlation test for Elementary and MI Student Process Skills. From the data, it can be seen that there is a relationship between the process skills of Elementary School and Madrasah Ibtidaiyah. This is evidenced by the value of sig (2-tailed) > 0.05

Discussion

This research is in line with previous research on students' process skills. However, previous studies only used variables regarding student process skills at the public school level. So that in previous studies it was not known the difference in student process skills between public schools and Madrasah Ibtidaiyah (Ihsan, I. A. & Saputra, 2019; Pamungkas et al., 2019; Wulandari et al., 2019). To find out the extent to which Madrasah Ibtidaiyah students have a good skill level among other school levels. It is known that Madrasah Ibtidaiyah is a religious school that prioritizes religious lessons so that the process skills of students at Madrasah Ibtidaiyah are not yet known. Many of the skills carried out by other studies have not yet entered the stage of multiplication of fractions learned by Madrasah Ibtidaiyah students. In this study, the researcher chose the student's process skills which aimed to understand the control, thought process, motivational attitude, and psychology faced by elementary school and Islamic elementary school students in learning fraction multiplication material. By testing this, it can be seen that students' process skills have an influence on the development of student learning in mathematics (Kowiyah & Mulyawati, 2018; Macnab & Payne, 2003; Suarsana, 2021). With good process skills students can develop knowledge, skills regarding the material of multiplication of fractions (Diantari, 2019; Moh'd et al., 2021; Rahmiati & Fahrurrozi, 2016). Process skills can evaluate problems related to mathematics subjects. In this way, the good skills of each student are formed (Bosica et al., 2021; Helsa et al., 2021). The essence of this study discusses the differences and relationships in the process skills of elementary school students and madrasah ibtidaiyah students. In other words, these differences and relationships describe students' skills in mathematics. It is known that there are differences and relationships between elementary schools and Madrasah Ibtidaiyah. The disadvantage of this research is that it only measures student skill variables and has not carried out testing with other variables such as attitudes, interests, motivation, learning models and others. So it is advisable to read other articles that contain other variables.

4. CONCLUSION

There is a comparison of the process skills of elementary school students and MI students obtained from descriptive statistics that SD N 04/I Ruang Sungai Ilir is superior to other schools tested with indicators of observation, measuring, compiling tables, and classification. As for the comparison of the process skills of elementary school students and MI students to mathematics lessons on multiplication of fractions, it was found that there were differences between schools. Then there is a relationship between the process skills of elementary school students and MI students as evidenced by the correlation test above.

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