
ANALYSIS OF INTEREST IN LEARNING MATHEMATICS OF JUNIOR HIGH SCHOOL STUDENTS USING OPEN- ENDED APPROACH GEOGEBRA ASSISSTED

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ARTICLE INFO

Article history:

Received May 13, 2023

Revised May 15, 2023

Accepted May 19, 2023

Keywords:

Interest in Learning
Mathematics
Open-Ended Approach
Geogebra Assissted

ABSTRACT

The aim of this study is to analyze students' interest in learning mathematics using open-ended approach with the help of software geogebra. This study used a qualitative descriptive method, with 29 students from 8th grade in SMP Negeri 36 Bandung as subjects, consisting of 14 male students and 15 female students. The data collection technique uses a questionnaire on the scale of students' interest in learning mathematics using an open-ended approach with the help of software geogebra. There are 18 statements consisting of nine positive statements and nine negative statements. The data collected from this study is processed using Microsoft Excel by calculating the average percentage of each indicator scale of student interest in learning. The results of data processing show that students have an interest in learning mathematics using open-ended approach with the help of software geogebra included in the very good category, namely obtaining an average percentage of 80.95%. The average is obtained from each index of student interest in learning. Used of the method purposed is proven to be very helpful for students in building interest in learning in mathematics.

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How to Cite:

Akbar, E.R., Yuliani, A., & Nurfauziah, P. (2023). Analysis of Interest in Learning Mathematics of Junior High School Students using Open-Ended Approach Geogebra Assissted. *JIML*, 6(3), 170-177.

INTRODUCTION

Mathematics is a branch of science that underlies various sciences. Its application is needed in the development of technology and information. Mathematics can also be used to solve problems in everyday life that require the ability to measure, calculate, communicate information and make decisions. This is because mathematics helps humans think logically, practically, critically, consistently, systematically, and in patterns (Khayati, Sujadi, dan Saputro., 2016). Therefore, students are expected to have a high desire in learning mathematics.

However, in reality, many students dislike and have difficulty learning mathematics because mathematics is considered a scary and boring subject (Yuniawatika, Yuspriyati, Sani & Febriyanti., 2016). Fear and hatred of math lessons make students less interested in learning. In line with Ningsih & Hayati (2020) also argues that students have no interest in learning mathematics because students assume that mathematics is the most difficult and frightening subject compared to other subjects. This causes students to be unable to feel the real function and usefulness of mathematics, one of which can be applied in everyday life. Meanwhile, according to Anditya & Murtiyasa (2016) mathematics is an important part of the life of individual humans, which should make mathematics a necessity for every individual human being.

The study conducted by Ayu, Ardianti & Wanabuliandari (2021) shows that low interest, student learning motivation and learning media that are less supportive or inadequate are one of the factors causing students' difficulties in learning mathematics. Interest in learning is a complete contribution from an individual with all their desire to gain knowledge and understanding of the scientific knowledge they observe (Jaya & Fitriani, 2022). Students' assumptions about feeling that there is no connection between mathematics and everyday life also cause students' interest in learning mathematics to be categorized into a low category (Pratama, Lestari & Jailani., 2018)

One of the efforts to address the low interest in learning in students is by implementing learning innovations that are in accordance with the characteristics of students, can direct and encourage students to think and develop and communicate their ideas by understanding them themselves or interacting. To achieve these learning objectives, alternative learning is needed that can train students to express mathematical ideas and grow students' reasoning and thinking optimally. Using learning methods in the teaching and learning process can increase students' interest in learning mathematics, and will make learning forums fun, not boring and easier for students to understand (Aedi, 2018).

Therefore, in a teaching and learning process, new innovations are needed in the form of approaches to increase interest in learning mathematics by actively involving students. One learning approach that can help achieve these goals is the learning approach open-ended. Open-ended has a basis of openness so that it gives freedom for students to practice thinking skills and understand a problem without sticking to one answer. Furthermore, through the open-ended students can learn to discuss various ideas with other students. Lestari, Hartono, dan Purwoko (2016) stated that after implementing the teaching and learning process with the open-ended approach makes students' mathematical reasoning ability in solving problems increase. Regardless of the learning approach, the use of media in mathematics learning can also increase students' interest in learning. As is the case, Hanipa, Misbahudin, Andreansyah & Setiawan (2019) stated that after implementing the teaching and learning process with the open-ended approach, students' mathematical reasoning ability in solving problems increase. Regardless of the learning approach, the use of media in mathematics learning can also increase students' interest in learning.

The use of appropriate learning media in learning mathematics is software geogebra. Geogebra is a software mathematics that can be used in better interpreting and visualizing some mathematical material so as to increase student understanding (Simbolon, 2020). The use of Software Geogebra in learning mathematics can make students interested because they find new things that attract their attention to learn and cause an increase in students' interest in learning mathematics. This is in line with the research of Wondo, Mei & Seto (2020) which states that the teaching and learning process carried out with the help of media geogebra this can increase students' interest in learning mathematics.

Previous research by Hulu & Telaumbanua (2022) analyzed interest in learning mathematics using an approach discovery learning and the results show that students' interest in learning mathematics with this approach is still in the medium category. Meanwhile, Ameliana, Rosyana dan Purwasih (2022) conducted research to analyze the effectiveness of using an assisted scientific approach software geogebra in increasing student learning interest in the cube sub material. In this study, the authors analyzed the interest in learning mathematics with another approach, namely open-ended approach with the help of geogebra. Based on the background above, the purpose of this research is to analyze students' interest in learning mathematics using an open-ended approach with the help of software geogebra.

METHOD

This study used descriptive qualitative method. Winarta (Lindawati & Hendri, 2016) states that the qualitative descriptive method is studying, showing, and summarizing data from an observation observed in the field under various conditions. The instruments used in this research are not a test tool form of a questionnaire approach open-ended help geogebra which consists of five indicators of students' interest in learning mathematics scale consisting of 18 statements and in it consists of nine positive statements and nine negative statements which are propagated using Google Form. The subjects in this study were 29 8th grade students of SMP Negeri 36 Bandung, with 14 male students and 15 female students. The assessment used in this study is in the form of scale likert. For points of each scale according to Manalu, Jumiaty & Setiawan (2019):

Table 1. Point Scale of Interest in Learning Mathematics

Scale	Statement Point	
	Positive	Negative
Strongly Agree	4	1
Agree	3	2
Disagree	2	3
Strongly Disagree	1	4

The Likert scale assessment is like the table above, namely : Strongly Agree, Agree, Disagree, and Strongly Disagree. The results that have been obtained are processed by calculating the percentage of each indicator item and accumulated as the average percentage of interest in learning with the formula according to Sudijono (Manalu, Jumiaty dan Setiawan., 2019) as follows :

$$P = \frac{f}{n} \times 100\%$$

With description :

P : percentage of student responses

f : student response frequency, and

n : the number of students

The attitude scale of interest in learning mathematics in students that has been obtained can be used to interpret the interest in learning mathematics in 8th grade junior high school students

in mathematics with an approach open-ended help software geogebra. The table below presents the criteria for interpreting the percentage of the questionnaire according to Riduan (Nurafni, Pujiastuti & Mutaqin., 2020).

Table 2. Questionnaire Results Percentage Interpretation Criteria

Percentage	Criteria
$80\% < P \leq 100\%$	Very Good
$60\% < P \leq 80\%$	Good
$40\% < P \leq 60\%$	Enough
$20\% < P \leq 40\%$	Not Good
$0\% < P \leq 20\%$	Very Not Good

RESULTS AND DISCUSSION

Results

The results obtained in this study were the answers to the questionnaire containing statements regarding the scale of students' learning interest in learning mathematics with the approach open-ended help software geogebra. Students in this case are the respondents given is not a test tool in the form of a questionnaire containing five indicators of interest in learning mathematics scale with 18 statements and it contains nine positive statements and nine negative statements. The data that was collected during the research was then analyzed to find out the average percentage of each indicator on the scale of students' interest in learning mathematics. The author analyzes the data using the help software Microsoft Excel. The results of data analysis are presented in Table 3.

Table 3. Percentage Scale of Students' Interest in Learning Mathematics

No	Indicator	Multiple Statements	Total			Criteria
			Score	Mean	Percentage	
1	Feeling Happy	3	289	96,33	83,05	Very Good
2	Student Interest	4	392	98	84,48	Very Good
3	Student Engagement	5	441	88,2	76,03	Good
4	Diligent in Learning and doing Math Assignments	3	287	95,67	82,47	Vey Good
5	Diligent and Disciplined in Learning and Have a Study Schedule	3	274	91,33	78,74	Good
Rate-rate					80,95	Very Good

Based on the table data above, it shows that the percentage of indicators of feeling happy gets a value of 83.05% and is included in the very good category, this is indicated by one of the statements, namely students feel happy learning mathematics using open-ended approach with the help of software geogebra. Most students agreeing even strongly agree. The percentage of students' interest indicators obtained a score of 84.48% belonging to the very good category, one of the statements stating student interest was that students were very interested in learning

mathematics using geogebra, It can also be seen that the mean value obtained was 98 from the four statements which stated that almost all students felt interested in learning mathematics. The percentage on the student involvement indicator scored 76.03% and is in the good category, this is stated from one of the statements, namely students are excited to make future presentations which means that students are actively involved during the learning process. The percentage of the indicators of being diligent in studying and doing math assignments obtained a value of 82.47% included in the very good category, with statements that students always solve open problems given because they give freedom of answer, this is seen from the open-ended approach which is used by raising open problems so that students give positive responses and are diligent in studying as well as doing math assignments. The percentage for the indicators of being diligent and disciplined in learning and having a study schedule gets a score of 78.74% and is included in the good category, obtained from the percentage of all statements and one of the statements which states that in learning students have their own study schedule so that learning is arranged neatly. This means that students are disciplined and diligent in learning to have their own study schedule. So it was found that the five indicators of interest in learning mathematics were included in the very good category with an average percentage of 80.95%.

Discussions

The beginning of what researchers did in this study was to do learning using the open-ended approach with the help of software geogebra. In this study the researchers aimed to increase students' interest in learning by introducing new things in learning. At the end of the meeting the researcher gave a questionnaire with a scale of student learning interest. This study is a type of qualitative descriptive research. Students answered an interest in learning mathematics in a questionnaire using google form given.

The first indicator is feeling happy which contains 3 statements, namely, 1) I like learning mathematics by applying an approach open-ended with the help of software geogebra, 2) I don't like learning mathematics, 3) I can understand the material taught by the teacher. In this first indicator aims to find out whether students feel happy doing learning using the open-ended approach and apply software geogebra. The results obtained on the feeling of pleasure indicator get a very good category. This means that students get pleasure, increase interest in learning, and students can capture the material provided by the teacher by using an open-ended approach with the help of software geogebra. This is because students really feel that there are new things they get, namely media and innovative learning models. In line with Suwarno's research, (2016) revealed that in order to increase interest and learning outcomes, media and learning models are needed. Therefore, this study applies a new learning approach, namely open-ended by applying software geogebra make students feel happy and their interest in learning also increases.

The second indicator is student interest which contains four statements, namely, 1) Learning by using an open-ended approach not fun, 2) I am very interested in learning mathematics using geogebra, 3) I am excited to solve the math problems given, 4) Mathematics lessons are very boring, which has the aim of measuring whether students are excited and interested in carrying out learning using the approaches and learning media that are applied. Based on the results obtained on the indicators of student interest, they get a very good category. It can be concluded that in this second indicator learning uses an open-ended approach assisted by software geogebra increasing student interest in learning can even get better learning outcomes. Interest in the teaching and learning process can make students get better results (Nabillah & Abadi, 2019).

The third indicator is student involvement which aims to find out what kind of student involvement in learning whether to participate actively or not. This indicator of student involvement consists of five statements, including 1) I am lazy to rewrite the work in the LKPD, 2) During mathematics learning I dare to express my opinion, 3) I am excited to make future presentations, 4) I have never tried to finish problem using software geogebra, 5) I feel embarrassed when ordered to do questions in front of the class. Nazirun, Gazali & Fikri (2019) stated that if students have a high interest in learning, they will be able to be actively involved during the learning process. The results obtained on the indicator of student involvement get a good category, with that it can be said that students who have an interest in learning also feel interested in the learning process that uses a learning approach open-ended with the help of software geogebra just as students are active in solving questions, presenting and also expressing opinions in discussion forums.

The next indicator is being diligent in studying and doing math assignments which consists of three statements, including 1) I always solve open problems given because they give freedom of answer, 2) I don't want to do difficult math assignments, 3) I will complete assignments that easy first, where the three statements intend to find out whether students always solve open problems and practice questions given. Based on the results obtained on this fourth indicator, it obtained a score in the very good category. A high interest in learning will naturally make students study diligently and also enthusiastic in participating in the learning process. This is in line with the research of Novianti, Sadipun & Balan (2020) which shows that one of the motivations for student learning is being diligent in studying the lessons being taught. So it can be concluded that students who have high learning motivation will always do the tasks and problems given, both easy and difficult ones.

The last indicator on the scale of students' interest in learning mathematics is diligent and disciplined in learning and having a study schedule. This indicator aims to see student discipline regarding schedules, sending assignments and pursuing things that have been learned during learning. This last indicator consists of three statements, including 1) In studying I have my own study schedule so that learning is arranged neatly, 2) I always send answers from assignments late, 3) I am diligently working on software geogebra. In the process of teaching and learning activities, students' interests can encourage them to continue learning. Students who are interested in learning will continue to be diligent and disciplined in learning (Sulasmi, 2020). Based on the results obtained on this last indicator, it gets a score in the good category. This means that student discipline and persistence in learning what has been taught, especially in this study, geogebra goes well and makes students have a good sense of discipline in learning, especially in mathematics.

From the average percentage of students' interest in learning mathematics, it shows a value of 80.95%, which means that it is in the very good category. In the course of learning, students show a positive response. One of the contributing factors is because learning uses an open-ended approach with the help of software geogebra is a groundbreaking new invention. In this case students feel something new so that students are more enthusiastic in the learning process. Thus it can be concluded for the application of the open-ended approach with the help of software geogebra can increase students' interest in learning mathematics. Therefore, open-ended approach helped with software geogebra in learning gives value in a very good category.

CONCLUSION

Based on the explanation above, the interest in learning mathematics for 8th grade junior high school students at SMP Negeri 36 Bandung with an open-ended approach with the help of

software geogebra is already well. This is shown by each indicator which is almost all included in the very good category with an accumulated average percentage of 80.95%.

Based on these conclusions, the advice that can be given by the author is that learning activities should not only focus on the material but also apply innovative learning approaches. It can also be supported by interesting learning media to increase student interest in the learning process. An experience and also new skills gained by learning using the application of the open-ended approach with the help of software geogebra help students learn a material in an innovative way.

ACKNOWLEDGMENTS

The author would like to thanks Mrs. Anggia Komarawati, S.Pd. as a mathematics teacher at SMP Negeri 36 Bandung who has guided the writer in the field and to students of class VIII B who have agreed to become the author's research subjects. Thank you to the ISAMME 4 committeeth who have assisted in the process of publishing this article and all parties who assisted and were involved in the process of this research.

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