



Portrait of Junior High School Students' Motivation in Learning Geometry

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ABSTRAK

Geometri merupakan salah satu cabang dari pelajaran matematika yang berkaitan dengan bentuk dan dimensi. Dalam pembelajaran geometri tidak jarang siswa mengalami kesulitan dan kekeliruan dalam memahami konsep. Motivasi menjadi salah satu faktor penting yang perlu diperhatikan agar siswa tetap semangat dalam proses pembelajaran geometri. Motivasi menjadi pendorong dan penggerak bagi siswa untuk aktif dalam proses pembelajaran. Penelitian ini bertujuan untuk memberikan potret kondisi motivasi siswa SMP dalam pembelajaran geometri. Penelitian ini merupakan penelitian deskriptif kuantitatif. Penelitian dilakukan terhadap 136 siswa SMP yang dipilih secara acak dari 3 kota yang berbeda, yaitu Medan, Tulungagung, dan Lombok. Teknik pengumpulan data dilakukan dengan menggunakan instrumen kuesioner motivasi. Analisis data dilakukan dengan analisis statistik deskriptif. Hasil penelitian ini menunjukkan bahwa motivasi siswa SMP dalam pembelajaran geometri tergolong tinggi dengan skor 3,96 pada skala 1-5.

Kata Kunci: geometri; motivasi; potret

ABSTRACT

Geometry is a branch of mathematics that deals with shapes and dimensions. In learning geometry it is not uncommon for students to experience difficulties and mistakes in understanding concepts. Motivation is an important factor that needs to be considered so that students remain enthusiastic in the learning process of geometry. Motivation becomes a driving force and trigger for students to be active in the learning process. This research aims to provide a portrait of the motivational condition of junior high school students in learning geometry. This research is quantitative descriptive. The research was conducted on 136 junior high school students who were randomly selected from 3 different cities, namely Medan, Tulungagung and Lombok. The data collection technique was carried out using a motivational questionnaire instrument. Data analysis was performed with descriptive statistical analysis. The results of this research indicate that junior high school students' motivation in learning geometry is high with a score of 3.96 on a scale of 1-5.

Keywords: geometry; motivation; portrait

INTRODUCTION

Mathematics is one of the subjects that is often found at various levels of education. Based on the Regulation of the Minister of Education and Culture Number 68 of 2013 concerning the Basic Framework and Curriculum Structure of Tsanawiyah Secondary Schools, mathematics subjects are part of the subjects developed by the government. According to (Abi, 2016) Mathematics is the science of logic, form, order, magnitude, and related concepts. Mathematics is divided into three main parts, namely algebra, analysis, and geometry. Geometry is a branch of mathematics and is one of the subject matters in mathematics at the elementary level. Angraini & Suparman (2020) said that geometry has

a lot to do with the formation of abstract concepts. This learning cannot only be done by knowledge transfer or lectures but must be done by forming concepts through a series of activities carried out directly by students (Destiana et al., 2020). This is in line with the opinion Sofyana (2013) that in learning geometry students are expected to be able to apply their geometry skills including: Visual skills, Verbal Skills (Descriptive skills), Drawing skills, Logical skills, and Applied Skills (Sumarni & Prayitno, 2016). Furthermore, the concept of geometry is connected with other mathematical concepts as well as being related to many situations of daily life (Clements & Sarama, 2011; Septian, 2022). Thus, it is hoped that educators and teachers will develop students' understanding of the concept of geometry and improve their ability to think geometry.

The relationship of geometry learning with learning theory proposed by Piaget stated that 11 or 12 years-old children is in the deductive hypothetical period (Copeland, 1984). In this period children have been able to develop a statement to affirm or refute it as a hypothesis and then prove the hypothesis through a comparison between its deductive consequences and the facts in its way of thinking. At this stage, the child is considered capable of operating arguments without being associated with concrete objects or able to reason without dealing with objects (directly). But the facts in the field show that there are still various problems in students' geometric thinking skills. Hardianti, (2018) posits about the existence of misconceptions and lack of knowledge in learning geometry because students do not understand the concept of the construct and only memorize the formula of a geometric construct. In the research Hasanah et al. (2021) stated that students who do not master the required material are less able to understand and master information, less thorough and hasty in solving difficulties, and do not make enough effort in solving the challenges presented. Similar research has also been conducted by Fauzi & Arisetyawan (2020), the results of his research concluded that there are difficulties for students in solving geometry problems, these difficulties include (1) students have difficulty in using concepts, (2) students have difficulties in using principles, and (3) students have difficulty in solving verbal problems.

Motivation is one of the factors that influence student learning outcomes. Motivation is defined as an urge or desire to take an action in order to achieve a certain goal (Uno, 2020; Winarni et al., 2016). Learning motivation can be interpreted as encouragement, which can come from inside or outside a person, to learn (Andriani & Rasto, 2019; Monika & Adman, 2017). Motivation is an important factor in a learning process (Sardiman, 2016). Motivation functions to encourage enthusiasm and move someone to do an activity (Sarinah & Mardalena, 2017; Vivin et al., 2019). Students with high learning motivation will show a positive response in learning. Students will be more active and generally be able to obtain good learning outcomes (Sanjaya & Pratama, 2021). This is in line with the results of research by Lin et al. (2017) which shows that motivation has a positive influence on student learning outcomes. Puspitasari (2013) added that motivation is not only a driving force to achieve good learning outcomes but also encouragement to try to achieve learning goals. So it can be said that motivation determines the intensity of student learning efforts to achieve maximum learning outcomes (Palupi, 2014).

Motivation can come from the inner self and can also come from outside (environment). Motivation from inner-self is usually referred to as an intrinsic factor, while motivation from outside is called an extrinsic factor (Uno, 2020). Intrinsic factors can be in the form of hopes, ideals, or needs. Extrinsic factors come from the environment such as comfortable and enjoyable learning situations, interesting learning activities, rewards, or punishments. The teacher plays an important role in building student learning motivation so that learning goes well (Annisa et al., 2021). According to (Sardiman, 2012) indicators of learning motivation include: 1) persistence, 2) showing interest in various kinds of problems, 3) preferring to work independently, 4) getting bored quickly, and 5) being able to defend opinions. In the learning process, there are several indicators used to measure student motivation including: 1) intrinsic goal orientation, 2) extrinsic goal orientation, 3) task value, 4) control beliefs for learning, 5) self-efficacy, and 6) test anxiety (Pintrich & Others, 1991).

Learning motivation is an important concern in the world of education. Previous studies regarding learning motivation were carried out by Vivin, Marpaung, & Manurung (2019) which discussed anxiety and learning motivation, then Setiawan, et al. (2022) which discusses the effect of learning motivation on mathematical problem solving abilities. Research by Simarmata, et al. (2018) and Septian & Komala (2019) regarding mathematical connection abilities and learning motivation using the Problem Based Learning Model which gives positive results to student learning outcomes. There is also research into the effectiveness of applying the Hypnoteaching method to junior high school students' mathematics learning motivation conducted by Dinasty, et al. (2021). Different from previous research, this study aims to provide a picture or portrait of students' learning motivation, especially in geometry material with the hope of being able to become the basis for developing better geometry learning methods.

Based on the description of the problem, this research aims to show a portrait of junior high school students' motivation in learning geometry.

RESEARCH METHODS

This research is quantitative research with descriptive type. This research aims to obtain information about the portrait of junior high school students' motivation in learning geometry. The research was conducted on 136 junior high school students who were randomly selected from 3 different cities, namely Medan, Tulungagung and Lombok. The data collection technique was carried out using a questionnaire instrument. The questionnaire instrument used is a motivational questionnaire for learning geometry adapted from (Dhea, 2019). The motivation questionnaire consists of 21 questions that are arranged based on indicators of student learning motivation, namely 1) intrinsic orientation goals, 2) extrinsic orientation goals, 3) task scores, 4) control beliefs for learning, 5) self-efficacy, and 6) test anxiety (Pintrich & Others, 1991). Each question was given answer options using a Likert scale (1-5) from Strongly Disagree (SD), Disagree (D), Doubtful (Df), Agree (A), to Strongly Agree (SA). The lattice of motivational instruments to learn geometry is shown in Table 1.

Table 1. Learning Motivation Instrument Lattice

No	Indicators	Items
1	Intrinsic orientation goals	1, 6, 10, 13
2	Extrinsic orientation goals	2, 7, 14, 19
3	Task scores	3, 8, 11, 15
4	Control beliefs for learning	12, 16, 20
5	Self-efficacy	4, 9, 17
6	Test anxiety	5, 18, 21

The data analysis technique used in this research is descriptive statistical analysis. The collected data is described in the form of percentages and averages. The data that has been described is then interpreted according to the learning motivation criteria adopted from Suren & Kandemir (2020) in table 2.

Table 2. Learning Motivation Interpretation Criteria

Mean ($\bar{x}$)	Criteria
4,20 – 5,00	Very High
3,40 – 4,19	High
2,60 – 3,39	Medium
1,80 – 2,59	Low
1,00 – 1,79	Very Low

(Suren & Ali Kandemir, 2020)

RESULT AND DISCUSSION

This research aims to provide a portrait of the condition of junior high school student motivation in learning geometry. The results of the research are presented based on 6 indicators of learning motivation which are then drawn conclusions based on the average score on each indicator. The results of each indicator of motivation to learn geometry are as follows.

Intrinsic Orientation Goals

The result on the indicator of intrinsic orientation goals is shown in Table 3.

Table 3. Result on The Indicator of Intrinsic Orientation Goals

No	Questions	Answers					Sum	$\bar{x}$
		1	2	3	4	5		
1	I like to have some materials that challenge me and make me learn more in geometry class	3 2,21%	2 1,47%	27 19,85%	71 52,21%	33 24,26%	136 100%	3,95
2	I really want to get the best grades in geometry	1 0,74%	2 1,47%	22 16,18%	56 41,18%	55 40,44%	136 100%	4,21
3	The skills I learned from geometry can be applied in other classes	1 0,74%	8 5,88%	35 25,74%	58 42,65%	34 25,00%	136 100%	3,87
4	Geometry contributes a lot to humans	0 0,00%	5 3,68%	34 25,00%	62 45,59%	35 25,74%	136 100%	3,93
Average								3,99

The indicator of intrinsic orientation goals obtains an average score of 3.99 which is included in the high criteria. This result indicates that students have good intrinsic orientation goals in learning geometry. Students have high motivation from within themselves to learn geometry.

Extrinsic Orientation Goals

The result on the indicator of extrinsic orientation goals is shown in Table 4.

Table 4. Result on The Indicator of Extrinsic Orientation Goals

No	Questions	Answers					Sum	$\bar{X}$
		1	2	3	4	5		
1	Geometry intrigues me	2 1,47%	2 1,47%	20 14,71%	65 47,49%	47 34,56%	136 100%	4,13
2	Learning geometry can improve my overall academy score	0 0,00%	5 3,68%	34 25,00%	67 49,26%	30 22,06%	136 100%	3,90
3	I will do better in class if I had the right study pattern for learning geometry	0 0,00%	3 2,21%	22 16,18%	68 50,00%	43 31,62%	136 100%	4,11
4	I believe that I will have great geometry score in class	0 0,00%	4 2,94%	42 30,88%	61 44,85%	29 21,32%	136 100%	3,85
Average								3,99

The indicator of extrinsic orientation goals obtains an average score of 3.99 which is included in the high criteria. This result indicates that students have good extrinsic orientation goals in learning geometry. In addition, external factors also affect students' motivation to learn geometry.

Task Score

The result on the indicator of task score is shown in Table 5.

Table 5. Result on The Indicator of Task Score

No	Questions	Answers					Sum	$\bar{X}$
		1	2	3	4	5		
1	My biggest desire is to understand the content of geometry	0 0,00%	1 0,74%	23 16,91%	67 49,62%	45 33,09%	136 100%	4,15
2	I hope I can get highest score in geometry	1 0,74%	5 3,68%	21 15,44%	56 41,18%	53 38,97%	136 100%	4,14
3	I feel that the geometry is very useful	0 0,00%	3 2,21%	28 20,59%	75 55,15%	30 22,06%	136 100%	3,97
4	I believe it is my fault if I don't do better in geometry class	2 1,47%	4 2,94%	27 19,85%	78 57,35%	25 18,38%	136 100%	3,88
Average								4,04

The indicator of task score obtains an average score of 4.04 which is included in the high criteria. This result indicates that students have high motivation to get and reach excellent scores in learning geometry. It shows that task score has an influence on students' motivation to learn geometry.

Control Beliefs for Learning

The result on the indicator of control beliefs for learning is shown in Table 6.

Table 6. Result on The Indicator of Control Beliefs for Learning

No	Questions	Answers					Sum	$\bar{X}$
		1	2	3	4	5		
1	I love every topic and content of geometry lessons	0 0,00%	6 4,41%	45 33,09%	61 44,85%	24 17,65%	136 100%	3,76
2	I can understand the contents of geometry if I learning hard enough	0 0,00%	2 1,47%	18 13,24%	71 52,21%	45 33,09%	136 100%	4,17
3	I believe that I can master every topic in geometry	2 1,47%	4 2,94%	45 33,09%	60 44,12%	25 18,38%	136 100%	3,75
Average								3,89

The indicator of control beliefs for learning obtains an average score of 3,89 which is included in the high criteria. This result indicates that students have control and belief in learning geometry. Students know how they can understand geometry lessons and believe in that way.

Self-Efficacy

The result on the indicator of self-efficacy is shown in table 7.

Table 7. Result on The Indicator of Self-Efficacy

No	Questions	Answers					Sum	$\bar{X}$
		1	2	3	4	5		
1	Learning geometry can improve the logic of my thinking	0 0,00%	2 1,47%	26 19,12%	61 44,85%	47 34,56%	136 100%	4,13
2	My best wish is to learn geometry more	0 0,00%	0 0,00%	29 21,32%	65 47,79%	42 30,88%	136 100%	4,10
3	If I can't understand every topic in geometry class, it's because I'm not study hard enough	1 0,74%	8 5,88%	28 20,59%	77 56,62%	22 16,18%	136 100%	3,82
Average								4,02

The indicator of self-efficacy obtains an average score of 4,02 which is included in the high criteria. This result indicates that students have good self-efficacy in geometry lessons. In addition, self-efficacy is the initial capital to reach learning achievements.

Test Anxiety

The result on the indicator of test anxiety is shown in table 8.

Table 8. Result on The Indicator of Test Anxiety

No	Questions	Answers					Sum	$\bar{X}$
		1	2	3	4	5		
1	I will study hard to get good score in geometry	0 0,00%	1 0,74%	22 16,18%	59 43,38%	54 39,71%	136 100%	4,22
2	If I pay attention in geometry, I can get better score	2 1,47%	2 1,47%	26 19,12%	69 50,74%	37 27,21%	136 100%	4,01
3	Geometry isn't difficult	4	15	69	34	14	136	3,29

for me	2,94%	11,03%	50,74%	25,00%	10,29%	100%
Average						3,84

The indicator of test anxiety obtains an average score of 3,84 which is included in the high criteria. This result indicates that students still have anxiety on the geometry test. This could happen because students expect satisfactory results in the test.

Accumulation of Motivation Indicators Scores

The accumulation of motivation indicators scores is shown in Table 9.

Table 9. Accumulation of Motivation Indicators Scores

No	Learning Motivation Indicator	$\bar{X}$	Criteria
1	Intrinsic orientation goals	3,99	High
2	Extrinsic orientation goals	3,99	High
3	Task scores	4,04	High
4	Control beliefs for learning	3,89	High
5	Self-efficacy	4,02	High
6	Test anxiety	3,84	High
Average		3,96	High

Table 9 shows the score results for each indicator of student learning motivation. In the objective indicators of intrinsic and extrinsic orientation the average score obtained is 3.99 including the high criteria. Students with high intrinsic and extrinsic motivation usually have a strong urge to be able to develop their creativity or skills (Dewi et al., 2019). Thus, intrinsic and extrinsic motivation are the main factors in students' motivation to learn mathematics where students need support both from within themselves and from the surrounding environment to build and increase their learning motivation.

On the task score indicator, an average of 4.04 is obtained including the high criterion. In the control indicator of belief for learning, the average score obtained is 3.89, including the high criteria. On self-efficacy indicators obtained an average of 4.02 including high criteria. Each of these indicators is related to one another, where students who have high self-confidence and self-efficacy control have high self-confidence to get good grades. It can be seen from the results of Table 9 that the highest average score of students is obtained on the task score indicator. This is in line with the results of research (Murtiyasa & Amini, 2021) that students with good self-confidence and self-efficacy have no difficulty doing the assignments given because students feel they understand the material provided well.

On the indicator testing the average anxiety obtained 3.84 including high criteria. This shows that students are less focused on following or doing the assignments given. Students are afraid of not being able to get a high score because they feel a lack of understanding regarding the material provided. The anxiety that students feel in learning mathematics is not only the result of students' difficulties in understanding learning, but factors from the surrounding environment such as lack of support for students can also be a cause of student anxiety (Akkaya & Polat, 2022; Septian et al., 2022)

The accumulated average score for each indicator of learning motivation is 3,96 and is included in the high criteria. It can be concluded that students have high motivation to learn geometry. The highest average score is on the indicator of task score. While the lowest average score is on the indicator of test anxiety. These results indicate that the task

score is the biggest motivation for students in geometry lessons. High test anxiety results indicate that even though students have high motivation and self-efficacy, there is still a sense of anxiety during the geometry test (Vivin et al., 2019).

The results of this research support the results of previous research conducted by Fendiyanto (2020) where students' motivation to learn mathematics is in good criteria with an accumulated average score of 3.82. This shows that students, especially at the junior high school level, have a high motivation to learn geometry or mathematics. According to Lin et al. (2017) learning motivation has a positive influence on student learning outcomes. Based on the results of this research which show high motivation to learn geometry, it is expected that students' learning outcomes of geometry will also be high.

CONCLUSION

The results of this research indicate that junior high school students' motivation in learning geometry is in high category. The results of this research also show that students still get anxiety during tests even though they have high motivation and self-efficacy. This portrait of junior high school students' motivation in learning geometry can be a reference for further research that wants to analyze student motivation and its relationship with other variables.

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