Efforts to Improve Mathematical Reasoning Ability and Learning Motivation of Vocational High School Students Through Hypnoteaching Learning Model

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ABSTRACT

This study aims to analyze the improvement of mathematical reasoning abilities of students who receive the hypnoteaching learning model and to examine the learning motivation of students who receive this learning model. This research is a classroom action research (CAR) conducted in 3 cycles. The subjects in this study were class X of SMK MARHAS Margahayu, Bandung Regency in the 2019/2020 academic year. The instruments used in this study include mathematical reasoning ability tests, learning motivation questionnaires, observation sheets and interviews. The results of the study showed: 1) hypnoteaching learning can improve mathematical reasoning skills, 2) students' learning motivation using the hypnoteaching learning model has higher motivation, 3) there is a correlation between mathematical reasoning skills and the motivation of students who receive learning with the hypnoteaching model. Research shows that the hypnoteaching learning model is effective in improving students' mathematical reasoning skills, encouraging higher learning motivation than before, and showing a significant correlation between increasing mathematical reasoning skills and students' learning motivation. This approach can be implemented to improve the overall quality of learning.

Keywords: Mathematical Reasoning Ability, Learning Motivation, SPLDV, Hypnoteaching

INTRODUCTION

Education is a process that influences students to be able to adapt to their environment. This process will cause changes in children that allow them to function effectively in society. Education is tasked with directing the learning process so that the target of the change can be achieved as desired (Hamalik, 2011). Mathematics is the main focus in the learning process in every school. Because mathematics is a science that underlies the development of modern technology in the world of education in Indonesia (Yaniawati, 2019). In the field of formal education in schools in particular, mathematics is used as one of the standard references for graduation. Therefore, it is very important for students to study mathematics.

In line with this, it is stated that mathematical material and mathematical reasoning have a very strong and inseparable relationship (Ministry of National Education, 2002). The material in mathematics is understood and communicated through reasoning and reasoning is understood and trained through learning mathematics. By learning mathematics, students' reasoning skills will improve because the thinking patterns developed in mathematics involve critical, systematic, logical, and creative thinking.

The competencies and survival skills needed by students in facing the 21st century are emphasized in seven skills, one of which is reasoning ability (Harjo, 2019), in this case mathematics learning needs to be developed in the process of thinking and reasoning for students' self-development in the future (Muharom, 2014). Mathematical reasoning is reasoning about mathematical objects. Mathematical objects in this case are basic objects that are often studied in mathematics which include facts, concepts, operations or relations and principles (Brodie, 2010). Copi (Sumartini, 2015) states that reasoning is a special form of thinking in an effort

to draw conclusions that are described by premises. Another opinion argues that reasoning is an activity, process or activity of thinking to draw a conclusion or make a new statement based on several statements that are known to be true or considered true (Shadiq, 2014). It can be said that reasoning is a person's power of thought in drawing and concluding something.

Mathematical reasoning ability is one of the important goals in learning, providing an understanding that the materials taught to students are not just for memorization, but more than that, with understanding students can better understand the concept of the subject matter itself. Mathematical reasoning is also one of the goals of every material delivered by the teacher, because the teacher is a guide for students to achieve the expected concept. In the aspect of reasoning, that mathematical material and mathematical reasoning are two things that cannot be separated. Students' perspectives on mathematical problems also influence their thought patterns about the solutions that will be carried out so that students can think and reason about a mathematical problem if they can understand the mathematical problem (Bani, 2011).

Ironically, mathematics among students is a less favorite subject, their motivation for this subject is low so that students' mastery of mathematics is very lacking. It is not easy to make students focus, like, and feel at home in the process of teaching and learning mathematics. Some of the causes are due to the lessons, learning models or the atmosphere created from the learning process.

However, the results of students' mathematics learning so far have not been encouraging, especially in the aspect of reasoning (Permana, 2007). Students' mathematical reasoning abilities are still relatively low. It can be seen from the preliminary study that the author has conducted in one of the vocational schools in Bandung Regency, namely SMK Marhas, the results showed that students' mathematical reasoning abilities are still relatively low in almost all indicators.

Table 1. Preliminary Study of Mathematical Reasoning

No	Indicator	Category	1	2	3	4	5
1	Analysis	Good	0	0	0	100%	0
2	Generalization	Low	50%	5%	45%	0	0
3	Synthesis	Very low	100%	0	0	0	0
4	Justification	Very low	100%	0	0	0	0
5	Non-Routine Troubleshooting	Low	70%	5%	0	20%	5%

In line with the results of the study above, it was also found that the level of students' mathematical reasoning ability is still relatively low (Diniyah, 2018). Based on the report of the results of The Trends in International Mathematics and Science Study (TIMSS) in 2015, Indonesia was ranked 44th out of 49 countries. Setiadi, et al. (2012) stated that one of the factors for the low TIMSS results achieved by Indonesia was due to the lack of training of students in solving questions that require reasoning. Indonesian students on average can only answer questions in the cognitive reasoning domain correctly by 17%, where the cognitive reasoning domain is the lowest percentage of correct answers for Indonesian students in addition to the knowledge domain which is 31% and the application domain which is 23% (Saputri, 2007).

The low mathematical reasoning ability is partly caused by the low motivation of students to learn mathematics. Isnaeni Isnaeni (2017) stated that there are still many students who do not have good reasoning skills. The reasoning ability possessed by students is still not optimal and learning independence is still an obstacle. The various levels of difficulty experienced by students in independent learning range from not understanding the concept to lacking learning motivation. This affects the learning outcomes achieved and the character that is embedded far from the target and expectations.

One of the causes is the low motivation of students to learn mathematics. According to Cole (2008) motivation is a condition that activates behavior to achieve goals caused by the motivation, while learning is a process

where behavior is changed through practice or experience. While learning is a process of effort carried out by individuals to obtain overall behavioral changes in interactions in the environment (Slameto, 2013). During learning, students who feel apathetic towards mathematics (Vega, 2020), students feel afraid first before learning. Most students consider mathematics learning difficult so they are not interested in learning it. To overcome this and achieve the best learning process results, it is necessary to apply an appropriate learning model, one of which is by applying a learning model that can increase students' learning motivation towards learning mathematics. One learning model that can increase students' learning motivation is the hypnoteaching learning model (Jarrah, 2020).

Hypnoteaching has a function to increase students' motivation, interest, and enthusiasm for learning (Mahardika, 2015). In addition, hypnoteaching can help most students to improve high-level thinking skills, making the topics studied easier and more entertaining (Widodo, 2020). Hypnoteaching is able to make students feel like and interested in mathematics lessons and is able to create conditions where students fully concentrate on mathematics lessons. Hypnoteaching is a technique that combines the science of hypnosis, communication, psychology and teaching techniques in the classroom. Hypoteaching as a process of delivering learning by giving suggestions using persuasive words to condition students to be in a focused condition (Edistria, 2012).

Reasoning is very much needed in every aspect and every side of this life so that every citizen can show and analyze every problem that arises clearly; can solve problems correctly; can assess something critically and objectively; and can express opinions and ideas coherently and logically (Hidayat, 2017). Furthermore, Hidayat (2017) states that reasoning is an activity of thinking to draw conclusions or make a new statement based on several statements that are known to be true or considered true which are called premises.

The hypnoteaching learning model is a learning method in which when delivering material, teachers use subconscious languages so that they can foster their own interest in students. As a method, hypnoteaching has the following advantages: 1) Students can develop according to their interests and potential; 2) Teachers can create a diverse learning process so that it is not boring for students; 3) A diverse learning process so that it is not boring for students; 4) Good interaction is created between teachers and students; 5) The material presented is able to focus students' attention; 6) The material is easy for students to master so that they are more motivated to learn; 7) There are many processes of providing skills during learning; 8) The learning process is active; 9) Students are more able to imagine and think creatively; 10) Because they do not memorize, students' absorption will be faster and last longer; 11) Teacher monitoring of students becomes more intensive; 12) Because the learning atmosphere is relaxed and enjoyable, this makes students feel happy and enthusiastic when participating in learning (Yustisia, 2014).

In line with the statement above, Hajar (2011) put forward several other advantages of the hypnoteaching method, namely: 1) The teaching and learning process is more dynamic and there is good interaction between teachers and students; 2) Students can develop according to their talents and interests; 3) The process of providing more skills is given in hypnoteaching; 4) The learning process in hypnoteaching is more diverse; 5) Students can easily master the material easily because they are more motivated to learn; 6) Learning is active; 7) Monitoring of students is more intensive; 8) Students are more able to imagine and think creatively; 9) Students will learn happily; 10) Absorption is faster and lasts longer; and 11) Students will concentrate fully on the learning material taught by the teacher.

Implementing the hypnoteaching learning model in the learning process requires teacher expertise in mastering psychological science (psychology). This psychological science must be possessed by teachers in an effort to strengthen students' mentality so that they feel confident to appear in front of the class and no students feel left out. The essence of hypnoteaching is a process where a teacher is able to use language that can relax and make students comfortable with regular intonation that has a persuasive meaning full of persuasion seen from both the vocal quality and the choice of words that should not use the word "will" and have negative meanings such as "no and don't". When students are in an alpha brain state, at that time the teacher inserts positive affirmations or positive suggestions into the student's subconscious mind.

Based on the experience experienced by the author that learning Mathematics in early childhood oriented to the hypnoteaching learning model will help a child to imagine which emphasizes a person's subconscious mind so that it can generate better ideas when directed to positive things and can increase the level of thinking that will be stored well. The teaching and learning process in schools is not only to increase student attention but also to try to improve student learning achievement.

METHODS

Types of research

The method that will be used in this research is the Classroom Action Research Method (CAR). The stages in classroom action research according to Arikunto, et al (2010), are (1) Planning, (2) Implementation, (3) Observation, and (4) Reflection.

Sample and Population

Sampling using purposive sampling technique, which is sampling based on certain considerations (Indrawan & Yaniawati, 2014). The sample in this study for the experimental class was class X RPL 1 and the control class X RPL 2. The material used in this study was the Two Variable Linear Equation System (SPLDV) material following the learning syllabus currently running at the school where the research took place. The mathematical reasoning ability test consisted of 6 essay questions and the non-learning motivation test consisted of 30 statement items.

Pretest and posttest were analyzed using normality, homogeneity and also t-test to determine the differences in mathematical reasoning abilities of the two classes between the experimental class and the control class. For the learning motivation scale, the same analysis was used but data processing was carried out first using MSI (Method Successfully Interval) to change the ordinal questionnaire data into interval data.

RESULT

The mathematical reasoning ability test in this study was conducted twice, namely before learning the SPLDV material (pretest) and after learning the SPLDV material was implemented (posttest). This test was given to the experimental class using the Hypnoteaching learning model and the control class using the conventional learning model. As for the student learning motivation questionnaire, it was given after learning the SPLDV material was implemented.

The detailed data on the N-Gain pretest and posttest results of students' mathematical reasoning abilities can be described in Table 1.3 below.

Table 2. Descriptive Statistics of N-Gain Results of Mathematical Reasoning Ability

N-Gain	Xmin	Xmax		Sd
Hypnoteaching	0.520	0.947	0.714	0.105
Normal	0.200	0.737	0.517	0.109

Based on the table above, the results show that the experimental class got an average score of 0.714 while the control class got a lower average of 0.517. This is in accordance with the maximum score obtained by the experimental class of 0.947 which is greater than the maximum score obtained by the control class of 0.737 with the minimum scores obtained by the experimental class and the control class respectively being 0.520 and 0.200. This proves that not only is there an increase but the experimental class gets superior results compared to the control class.

Based on the results of data analysis, it is known that the improvement and achievement of students' mathematical reasoning abilities using the hypnoteaching model are better than students who receive

conventional learning. In addition, according to the results of classroom learning observations during the first meeting, students looked very excited and enthusiastic in participating in learning. In the following meetings, students had begun to get used to participating in learning activities using the hypnoteaching model, so that students were seen to be more active in group discussions, conveying answers and responses and responding to answers from other groups. Students began to get used to the problems given because they were related to problems in everyday life.

The hypnoteaching model greatly influences the indicators of students' mathematical reasoning abilities, including students are given motivation to analyze and be problem-oriented, teachers guide students to make connections between different elements of knowledge with related representations. Students are guided to combine facts, concepts taught with existing problems and draw conclusions for the problems given, so that students can solve problems in the context of mathematics or everyday life. The hypnoteaching learning model provides motivation and suggestions to students to be able to present all their learning outcomes in various forms and ways, students are always directed in analyzing and evaluating the problem-solving process.

This study also shows that learning using the hypnoteaching model can improve students' mathematical reasoning abilities in SPLDV material. This is in accordance with Kasmaja's research (2017), the results of the study showed that the average value of the mathematics learning outcome test measured through the initial test before the start of learning and the final test after learning using the hypnoteaching method increased. In addition, the results of Hairul's research (2019) showed that the increase in mathematical connection abilities that received hypnoteaching learning was overall better than regular or conventional learning.

The hypnoteaching method uses relaxation that helps students connect their previous knowledge with the topics to be studied and with suggestions in hypnoteaching strengthens students in exploring and finding concepts in mathematics, teachers guide students to recognize the relationship between mathematical concepts that are already known and those that are newly learned. Kasmaja (2017) explains that the hypnoteaching learning method makes learning activities interesting and fosters students' desire to solve problems that occur both in learning and outside the context of learning itself.

Learning using the hypnoteaching model allows students to work together in groups, starting from observing, asking, collecting information, reasoning and communicating and there is relaxation in learning activities. In this case, students understand the material being studied better because all of these activities influence students to be active in every learning activity so that learning is more interactive.

Table 3. Correlation of mathematical reasoning ability and learning motivation of hypnoteaching

Motivation to learn	Pearson Correlation	1	,973**
	Sig. (2-tailed)		,000
	Sum of Squares and Cross-products	54296,543	878,551
	Covariance	920,280	14,891
	N	60	60
CLASS	Pearson Correlation	,973**	1
	Sig. (2-tailed)	,000	
	Sum of Squares and Cross-products	878,551	15,000
	Covariance	14,891	,254
	N	60	60

Based on table 3, the correlation results between mathematical reasoning ability and learning motivation of experimental class students are 0.973 and the significance value is 0.000. The correlation value (r) obtained is 0.973, which means that the level of relationship is classified as high. Because the significance value of 0.000 is less than 0.05, there is a significant relationship between mathematical reasoning ability and learning motivation of experimental class students.

The relationship between mathematical reasoning ability and learning motivation using conventional learning can be seen in the following table.

Table 4. Correlation test statistics of mathematical reasoning ability and learning motivation of conventional class students

		Motivation to learn	CLASS
Motivation to learn	Pearson Correlation	1	,973**
	Sig. (2-tailed)		,000
	Sum of Squares and Cross-products	67718,948	980,881
	Covariance	1147,779	16,625
	N	60	60
CLASS	Pearson Correlation	,973**	1
	Sig. (2-tailed)	,000	
	Sum of Squares and Cross-products	980,881	15,000
	Covariance	16,625	,254
	N	60	60

Based on table 4, it is the same as the results of the experimental class that the correlation results between mathematical reasoning ability and learning motivation of control class students are 0.973 and the significance value is 0.000. The correlation value (r) obtained is 0.973 which means that the level of relationship is classified as high. Because the significance value of 0.000 is less than 0.05, there is a significant relationship between mathematical reasoning ability and learning motivation of control class students.

The importance of student learning motivation in learning is a concern in developing learning activities. High student learning motivation will result in high mathematical reasoning ability of students, while low student learning motivation will also result in low mathematical reasoning ability of students. Students who have high learning motivation will always be confident in their abilities that students can work on or solve problems well and try to eliminate feelings of inability to work on problems in order to obtain satisfactory results.

This is in line with the opinion of Setiawan (2016) who stated that reasoning ability in mathematics and learning motivation together have a positive interaction on learning achievement. Students who have high motivation will try their best to produce better mathematics learning outcomes. In life, students will study diligently and seriously in studying mathematics material that has not been understood and will have the desire and desire to succeed.

The following is a summary of the teacher and student observation sheets and student learning outcomes in each cycle.
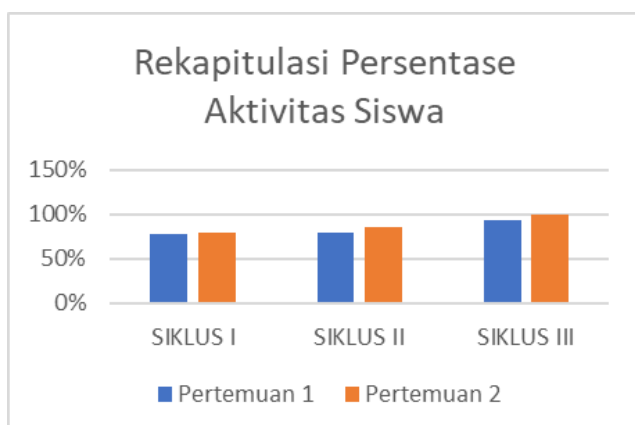

Figure 1. Recapitulation of Student Activity Percentage

In cycle III the results obtained showed optimal student activity in accordance with the planned learning plan using the hypnoteaching model. This is better than in cycle I and cycle II.

Meanwhile, in the teacher's activities, the results obtained are not much different from the students' activities. In conducting learning, the teacher is classified as very good and the students' learning outcomes are above the completion standard. So in cycle III it is said to be complete, which means that the teacher and students have understood the meaning of implementing learning with the hypnoteaching method.
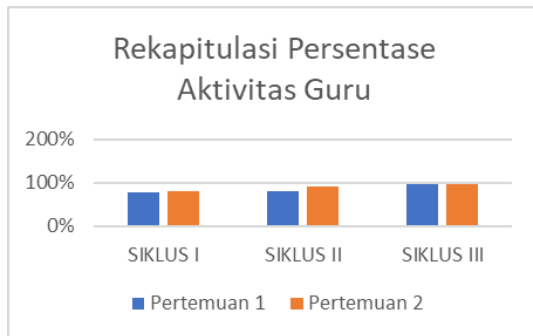

Figure 2. Recapitulation of Teacher Activity Percentage

Based on the picture above, it was found that students and teachers from the experimental class were at a very good level with an overall percentage of 87%. Starting from the introduction between teachers and students, the learning process was carried out very well, although adjustments were needed in the first and second meetings, but in subsequent meetings it went well. In the core activities, students and teachers also carried out the learning process very well in accordance with the learning syntax until the closing stage went very well. The classroom atmosphere, the teacher's enthusiasm in teaching was also classified as very good, only in time management which did require more time so that in meetings 3 and 4 the time was slightly exceeded but was classified as quite good.

It was also found that students and teachers from the control class were at a good level with an overall percentage of 76%. Starting from the introduction between the teacher and students, the learning process was carried out well, although adjustments were needed in the first meeting to the third meeting, but in subsequent meetings it went well. In the core activities, students and teachers also carried out the learning process well in accordance with the learning syntax, there were several stages that were classified as very good, including the stages carried out by the teacher in learning, the teacher's ability to make the final main line, corrective techniques carried out by the teacher, providing encouragement to other students to participate maximally in the process of completing assignments and discussions. From this, it can be seen that the teacher was the one who played a more active role in the control class. In the closing stage, it went well, especially since the teacher's enthusiasm in teaching was classified as very good.
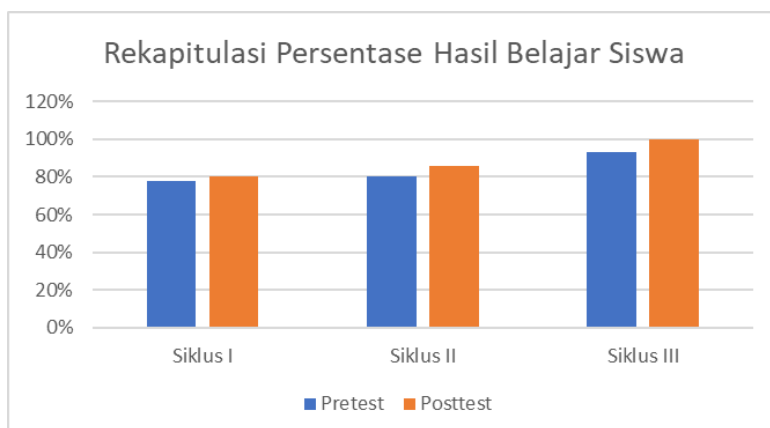

Figure 3. Recapitulation of Percentage of Student Learning Outcomes

The first finding seen from the pretest results regarding students' mathematical reasoning abilities showed that classes using conventional learning models were better than classes using the hypnoteaching model. This can be seen from the low mathematical reasoning abilities of students caused by students being less able to understand story problems. At the end of the study after being given treatment, both groups were given a final test or posttest and it turned out that the class using the hypnoteaching model was better than the class using the conventional learning model.

Then the next finding is an increase in students' mathematical reasoning ability who apply learning using the hypnoteaching model. This is because in classes with the hypnoteaching model students are more active and enthusiastic compared to conventional learning models. This is in line with other findings that show that the percentage of student activity has a better influence on mathematical reasoning (Triastuti, 2017) and the use of learning models that encourage student activity also has a positive impact on improving mathematical reasoning abilities (Linuhung, 2016).

DISCUSSION

This study shows that learning using the hypnoteaching model can improve students' mathematical reasoning abilities in SPLDV material. This is in accordance with the results of the study which showed that the average score of the mathematics learning outcome test measured through the initial test before the start of learning and the final test after learning using the hypnoteaching method increased (Kasmaja, 2017). In addition, the results of other studies show that the increase in mathematical connection abilities that receive hypnoteaching learning is overall better than regular or conventional learning (Saleh, 2019).

The hypnoteaching model has a great influence on the indicators of student learning motivation, including students are given positive suggestions so that students have the desire and will to succeed, have the drive and need to learn, and have hopes and ideals in the future. The learning process using the hypnoteaching model makes learning activities more interesting and teachers give awards to students who are active in learning so that student learning motivation can increase. There are several indicators of student learning motivation, namely the desire and will to succeed, the drive and need to learn, hopes and ideals for the future, awards in learning, and a conducive learning environment (Uno, 2011). Meanwhile, according to Sadirman (Sardiman, 2007) there are several ways to foster student learning motivation, namely by giving numbers, prizes, rivals/competitions, ego-involvement, giving tests, knowing the results of work, praise, punishment, desire to learn, interests and recognized goals.

The learning process in the classroom is in accordance with the steps of implementing hypnoteaching according to Hajar (Hasbullah, 2015), namely the teacher's intention and motivation before teaching, pacing, leading, using positive words when teaching, giving praise to students, and modeling. The key to the hypnoteaching method is how teachers create a comfortable learning environment both internally (psychologically) and externally (physically) so that comfort is created in learning, they will also feel a pleasant learning process, and when in a learning process they feel comfortable, it is certain that the material delivered by the teacher will be easily absorbed by students (Kasmaja, 2017).

Based on the explanation above, it can be concluded that the learning motivation of students who use the hypnoteaching model is higher than students who use conventional learning models. This is in line with the results of research that students' learning motivation has increased in learning mathematics using the hypnoteaching model (Kasmaja, 2016).

CONCLUSION AND RECOMMENDATIONS

Based on the results of data processing, analysis, findings and discussions that have been carried out previously, several conclusions were obtained, including that learning using the hypnoteaching model can improve students' mathematical reasoning skills and learning motivation, especially for indicators of motivation to analyze and be problem-oriented. The learning motivation of students who use the

hypnoteaching model is better than students who use conventional learning and there is a correlation between the mathematical reasoning skills and learning motivation of students who receive learning with the hypnoteaching model and students who receive conventional learning. The implementation of learning using the hypnoteaching model runs well and smoothly according to the hypnoteaching syntax used.

Some of the obstacles found during the learning process include: Research schedule, quite difficult adjustments at the beginning of the meeting, poor time management at the beginning. Based on this, the author puts forward several suggestions for subsequent researchers who are expected to pay attention and better manage time allocation during learning.

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