The Effect of Inquiry Learning Strategy and Learning Motivation on Mathematics Learning Outcomes of Students of Class VIII SMP Negeri 1 Parapat 2022/2023

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Abstract. The achievement of educational goals based on Law no. 20 of 2003 requires teachers to be able to choose appropriate learning methods, strategies, models and media for students so that learning becomes active and effective and can increase learning motivation. Inquiry and expository learning strategies have different foundations, especially in learning Mathematics. The research will be carried out in early August for the 2022/2023 academic year for seventh grade students at SMP Negeri 1 Parapat . The research sample is the students of class VIII-1 being the experimental class and VIII-5 being the control class. Research instruments in the form of tests and non-tests. The results showed that 1) there are differences in learning outcomes of mathematics in students who are taught with inquiry learning strategies and expository learning strategies. This is evidence that learning strategies do have an influence on learning outcomes in Mathematics. 2) There are differences in mathematics learning outcomes for students who have high and low learning motivation. This is evidence that learning motivation has an influence in learning Mathematics. 3) There is an interaction between learning strategies and learning motivation on mathematics learning outcomes.

Keywords: *Learning Strategy, Learning Motivation, Outcome of Learning Mathematics*

I. INTRODUCTION

In accordance with the law No.20 Year 2003 about System Education National, education is a structured activity for the sake of realize good study so that student by active can develop ability herself for have religious spiritual strength, self-control, personality, intelligence, morals noble, moral and skills needed by the community, nation and Country. This is a demand for teachers in choosing methods, strategies, models and learning media that are suitable for students so that learning becomes active and effective.

Teacher no only tasked with carrying out established curriculum, but must also be able to be creative and sensitive to the surrounding environment when teaching and learning activities take place. With atmosphere which comfortable and fun in process study teaching is expected to be able provide understanding and interest in self students so that appear motivation study. Motivation study is mental feeling which push activity teaching and learning is more active and fun.

In acquiring this aspect to students, teachers often have difficulty. For example, when teaching and learning activities take place, students look bored and tend not to care about the material presented. This was conveyed by the researchers based on the observations of researchers at SMP Negeri 1 Parapat when researchers observed how teachers taught at the school. There are times when students become active and often students become more passive. Through these observations, the researcher concludes that the problems in learning occur when the teacher is not precise in choosing the teaching style and the lack of learning media used. Therefore, researchers are interested in conducting research in the selection of learning strategies. In this study, researchers chose inquiry learning strategies and expository learning strategies.

The reason the researcher chose the two strategies to be compared is because the discussion above and these two strategies have very different implementations and philosophies. Inquiry learning strategy is a learning strategy that emphasizes teaching and learning activities on critical thinking processes and analysis to find answers to the problems themselves. This is inversely proportional to the expository learning strategy which prioritizes time efficiency in delivering

material so that the existing learning time can be used as best as possible in learning. The choice of strategy in this study is also expected to be able to foster learning motivation in students which is also one of the most important aspects in achieving learning objectives.

Importance motivation in study is ingredient study which interesting and important for teachers as well as a demand, that teachers need to have outlook which related height learning which fun and effective in order to help students increase motivation study especially in the field studies Mathematics. Difficulties the reinforced with some situations that exist, among them are still often found changes in teaching methods on the same material. Because of this, students become a little confused and tend not to understand the material presented.

This is based on the observations of researchers while teaching in class VIII at SMP Negeri 1 Parapat. Observation results show in visible teaching and learning activities motivation study student on subjects Mathematics very low. Thing this seen from attitude student less notice on eye lesson the. Thing this caused because approach learning used by teacher is more passive and often left by the teacher when learning is taking place as well as the lack of learning media used. Limited class hours used for learning Mathematics also take effect big on motivation study student.

This is what makes researchers interested in examining the effect of learning strategies and learning motivation on learning outcomes, especially in Mathematics subjects with the research title "The Influence of Inquiry Learning Strategies and Learning Motivation on Mathematics Learning Outcomes in Grade VII Students of SMP Negeri 1 Parapat, Academic Year 2022/ 2023"

According to Putrayasa [4] mentions that Inquiry learning strategy is one of the strategies that play a role important in build paradigm learning constructivist which emphasize on liveliness study student. Activity learning conducted for grow ability student in use Skills process with formulate question which lead on activity investigation, arrange hypothesis, To do test, gather and cultivate data, evaluate and communicate results the findings in Public study. Subba (2019) argues that the inquiry learning strategy is a learning strategy in which questions will be asked and thus students will be encouraged to ask questions. This will help students to conceptualize the subject and solve problems.

Based on the opinions of the experts above, the researcher concludes that the inquiry learning strategy is a learning strategy that carries out teaching and learning activities that are student-oriented (constructivist) by providing learning problems that will be answered or solved by students independently.

The inquiry learning strategy will be effective if: a) The teacher expects that: Students can find their own answers to a problem given , b) If Theory which will taught no in the form of facts or concepts that have been so, but a conclusion that need proof, c) If teaching and learning activities depart from a sense of curiosity learners to something, d) If teacher who will provide learning on group learners which average have will and thinking skills, e) If the number of students who learn is not too much so that it can be controlled by the teacher, d) If the teacher has enough time to using a student-centered approach [12].

The implementation of the inquiry learning strategy according to Sanjaya (2018) and which will be carried out in this study includes 6 stages, namely orientation, formulating problems, proposing hypotheses, collecting data, testing hypotheses and formulating conclusions. The orientation stage is carried out with the opening at the beginning of teaching, starting from preparing students, praying, conveying learning objectives, to how the learning will be carried out. Formulating the problem means that the teacher will provide problems or problems that can trigger students' interest in the material. Then at the stage of proposing a hypothesis the teacher will ask students to provide answers related to the problems given. At the stage of collecting data the teacher will ask students to explain the learning resources that students get to answer the problem. The source in question can be obtained through anything, for example the internet, books or classmates. At the stage of testing the hypothesis, the teacher will try to give a different problem but with the same way of solving it with the aim that students understand better about solving the problem.

As a comparison of the inquiry learning strategy, the researcher will try teaching using expository learning strategies. According to [8] expository learning is a learning strategy that emphasizes the process of delivering material verbally from a teacher to a group of students with the intention that students can master the subject matter optimally. Maheasy (2022) added that the expository learning strategy is a strategy that requires more mature preparation compared to other strategies because this strategy focuses all learning processes on the teacher so that teachers are required to master all things related to the material to be taught. Rumbrawer [6] also argues that expository learning strategies can be said as *direct instruction strategies* because in this learning the teacher conveys the subject matter directly, therefore this strategy is also often referred to as " *chalk and talk* ".

In accordance with this opinion, it can be concluded that *expository learning* is a learning strategy used by providing prior information about the definitions, principles, and concepts of the subject matter and providing examples of problem solving exercises. Problem solving through this learning can be done using lecture, demonstration, question and answer methods, and exercises. Students follow the learning pattern set by the teacher carefully.

The implementation of learning using expository learning strategies according to [8] and which will be carried out in this research are 5 stages. First, the teacher will convey the objectives and prepare the students in advance. Second, the teacher demonstrates the knowledge and skills as well as the material to be delivered. Third, the teacher guides regarding the provision of material. Fourth, the teacher checks the understanding of the students' material by providing opportunities to ask questions. Fifth, the teacher provides exercises to do.

The achievement of learning objectives is not only based on external influences, but also internal factors, namely the students themselves. The internal factors in question include many things, but in this study the researchers focused on looking at students' mathematics learning outcomes by being linked to learning motivation. According to Andriani [1], learning motivation is defined as a driving force to carry out certain learning activities that come from within and also from outside the individual so that it creates and fosters enthusiasm for learning. Sardiman [8] says that learning motivation is the overall driving force of both in self nor from outside student (with create series effort for provide conditions certain) which ensure continuity and give direction on activity study, so that destination which requested by subject learn it could achieved. Based on the opinion above, it can be concluded that learning motivation is a strong impetus to do something, which in this case is to carry out learning activities where the urge can come from within students and the environment around students.

The hypothesis of this research consists of 3 parts, 1) there are differences in learning outcomes of mathematics between students who are taught using inquiry learning strategies and expository learning strategies. 2) There are differences in Mathematics learning outcomes between groups of students who have high learning motivation and groups of students who have low learning motivation. 3) There is an interaction between learning strategies and learning motivation in influencing mathematics learning outcomes.

II. METHODS

The research will be carried out in early August for the 2022/2023 academic year for seventh grade students at SMP Negeri 1 Parapat. The research sample was selected using *purposive sampling technique.* According to Lenaini [2] *purposive sampling technique* is a method or method of determining samples from a population or group by means of researchers ensuring suitable sample candidates in research with the aim of making it easier for researchers to conduct research. So that in this study the population of this study there are 7 classes in class VIII and by using *purposive sampling technique the* researcher chooses class VIII-1 to be the experimental class, namely students get mathematics learning using inquiry learning strategies and class VIII-5 becomes the control class, namely students get Mathematics learning by using expository learning strategies. This research will use a type of quantitative research with a research method that is *Experiment Design* . According to [6], revealed that this method is *validation* or testing, namely testing the effect of one or more research variables on other research variables.

The design of this study uses a 2x2 factorial data analysis design so that in this study using this design this study has 8. Further discussion regarding the groups of data in this study will be explained in the following table.

Table 1. Research Group 2x2 Factorial Data

Group name	Information
A1	Group of students taught with inquiry learning strategies
A2	Group of students who are taught with expository learning strategies.
B1	Group of students who have high learning motivation.
B2	Group of students who have low learning motivation.
A1B1	Groups of students who have high learning motivation who study with inquiry learning strategies.
A2B1	Groups of students who have high learning motivation who learn with expository learning strategies.
A1B2	Groups of students who have low learning motivation who study with inquiry learning strategies.
A2B2	Groups of students who have low learning motivation who learn with expository learning strategies.

of research instruments used to collect data. The first is a test instrument in the form of Mathematics questions, totaling 10 questions to measure Mathematics learning outcomes. The second is a non-test instrument in the form of a learning motivation questionnaire to measure the level of learning motivation in students.

To find out whether the research hypothesis that has been prepared is accepted or not, the data collected will go through three stages of data testing. Normality test using the Lilifors formula, homogeneity test using the Bartlett test and finally the hypothesis test using the Tukcey test [9].

III. RESULTS AND DISCUSSION

After conducting research in both classes, experiment and control, the researcher found a description of the data on students' scores that varied. The mathematics learning outcomes obtained in the two classes will be scattered and grouped based on the level of learning motivation of class VIII SMP Negeri 1 Parapat students and will be linked through learning strategies to adjust with a 2x2 factorial design. Further explanation will be explained through the following table.

Table 2. Description of Research Group Data

Group Value Data A1			A2 . Group Value Data		
interval	$f_{absolut}$	$f_{relatif}$ (%)	interval	$f_{absolut}$	$f_{relatif}$ (%)
60-65	4	12.5	59-64	10	31.25
66-70	5	15.62	65-69	11	34,375
71-75	4	12.5	70-74	7	21.87
76-80	4	12.5	75-80	2	6.25
81-85	9	28,12	81-84	1	3.12
86-90	6	18.75	85-90	1	3.12
Amount	32	99.99 (100)	Amount	32	99.98 (100)

Value Data Group B1			B2 Group Value Data			Group Value Data A1B1		
interval	f_a	f_r(%)	interval	f_a	f_r(%)	interval	f_a	f_r(%)
66-70	7	21.87	59-63	11	34.37	59-63	11	34.37
71-75	6	18.75	64-68	13	40.62	64-68	13	40.62
76-80	3	9.37	69-73	3	9.37	69-73	3	9.37
81-85	10	31.25	74-78	2	6.25	74-78	2	6.25
86-90	6	18.75	79-83	2	6.25	79-83	2	6.25
			84-88	1	3.12	84-88	1	3.12
Amount	32	99.99 (100)	Amount	32	99.98 (100)	Amount	16	100

A1B2 Group Value Data			Value Data Group A2B1			Value Data Group A2B1		
interval	f_a	f_r(%)	interval	f_a	f_r(%)	interval	f_a	f_r(%)
63-67	9	56.25	62-67	3	18.75	59-61	3	18.75
68-72	2	12.5	68-73	6	37.5	62-64	7	43.75
73-77	1	6.25	74-79	5	31.25	65-67	5	31.25
78-82	3	18.75	80-85	1	6.25	68-70	1	6.25
83-87	1	6.25	86-91	1	6.25	Amount	16	100
Amount	16	100	Amount	16	100			

Based on the description of the data on the value of mathematics learning outcomes above, it can be seen that the highest score is in students who are taught with inquiry learning strategies, both those who have high and low learning motivation. Although the description above shows that the inquiry learning strategy has a positive effect on mathematics learning outcomes, it is still necessary to test data analysis to see whether the hypothesis prepared is accepted or not. Data that has passed three stages of testing namely normality test, homogeneity test and hypothesis testing will be described in the following table.

Table 3. Description of Research Group Data

		Normality test				Homogeneity Test	
Group name	**n (Number of Students)**	**L_o**	**L_t (α=0.05)**	**Status**	**Chi value**	**Chi Table**	**Status**
A1	32	0.1362	0.1566	Normal			
A2	32	0.0872	0.1566	Normal			
B1	32	0.1268	0.1566	Normal			
B2	32	0.1149	0.1566	Normal			Data Homogeneous
A1B1	16	0.1161	0.213	Normal	7.61	7.81	
A1B2	16	0.1250	0.213	Normal			
A2B1	16	0.1825	0.213	Normal			
A2B2	16	0.0767	0.213	Normal			

Hypothesis testing			
Hypothesis	**F Value Count**	**Table F Value**	**Status**
First	58.5966	4	Received
Second	94.289	4	Received
Third	4.14	4	Received

In accordance with the calculations and assessment of the data analysis that has been carried out, it is known that the findings that can be described are 1) there are differences in learning outcomes of mathematics in students who are taught with inquiry learning strategies and expository learning strategies. This is evidence that learning strategies do have an influence on learning outcomes in Mathematics. 2) There are differences in mathematics learning outcomes for students who have high and low learning motivation. This is evidence that learning motivation has an influence in learning Mathematics. 3) There is an interaction between learning strategies and learning motivation on mathematics learning outcomes.

The results of this study conclude that the achievement of the learning objectives that have been set is due to various aspects, namely: (1) Teachers, teachers as givers of direction and role models must be able to determine appropriate and good learning strategies in the learning process. Procurement of learning media is highly recommended to increase student motivation in learning, how to behave as a teacher to involve students in learning, and develop teaching materials so that students do not feel bored and bored. (2) Students, internal desires of students in participating in learning. (3) External factors, conducive learning atmosphere and conditions so that students can focus more and take the core of teaching materials.

IV. CONCLUSIONS

Based on the discussion above, the researcher can say that the role of a teacher or educator is very important in achieving learning objectives. Adapting to that, the practical implications that must be done by Mathematics teachers based on the findings in this study are first, trying to apply and optimize the use of appropriate learning strategies in learning Mathematics. The application of inquiry learning strategies in intensive Mathematics learning based on the findings in this study is able to provide a positive effect for students who have high or low learning motivation. The application of expository learning strategies is able to make learning that takes place more practical and faster than the inquiry learning strategy. This is because the expository learning strategy does not require the teacher to dig deeper into the abilities and desires of students in the teaching and learning process. Therefore, with this research, researchers hope that teachers, especially Mathematics learning, must be able to choose the right way of teaching with the material to be taught.

Second, try to pay attention to and increase learning motivation in students. Teachers should try to foster learning motivation in students to improve mathematics learning outcomes because the value of mathematics learning outcomes obtained is better for students who have high learning motivation to write when compared to low ones. This indicates that good learning is learning that is applied with the desire and willingness of the students themselves.

Based on observations in the implementation of this research, students' learning motivation can be increased in several ways, namely: (1) involving students in the learning process, the activeness of students is proven to increase students' motivation in the learning process. (2) Giving problems and directing students to think critically and give proper appreciation to the answers given by students, both wrong and right. (3) Redistributing the work of students who have been checked to create transparency for teachers and students.

According to the researcher, if the above discussion is carried out intensively, effectively, and directed, the teacher will get the result that the growth of students' learning motivation can have a good effect on learning outcomes in Mathematics.

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