

# Increasing Mathematics Learning Outcomes Through The Application of Rule Learning Methods in Class VII Students of SMPN Walenrang, Lamasi District

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## Abstract

This research is classroom action research. The research was conducted at the Walenrang State Junior High School, Lamasi District. This study involved students of class VII with a total of 40 students. The purpose of this research is to improve mathematics learning outcomes through the application of the RULE LEARNING method to the seventh grade students of SMP Negeri Walenrang. This study used 2 cycles with each cycle consisting of 5 meetings. Based on the results of the implementation of learning and discussion on the implementation of learning the rule learning method in class VII, the authors can conclude that efforts to increase student activity and involvement in the learning process as well as improve learning outcomes in mathematics can be done by applying the rule learning method. The results of this study prove that the rule learning type learning model is able to improve student learning outcomes in the learning process.

**Keywords:** *mathematics learning outcomes, motivation, and building space*

## Introduction

Law Number 20 of 2003 concerning the National Education System states that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character and skills needed by himself, society, nation and state. Humans in the new era of globalization have dimensions not only domestic but also global dimensions between countries in the world. We live in an open world, a world without boundaries, therefore global life is not only a challenge but also opens up new opportunities in an effort to improve the living standards of the Indonesian people and nation. There are various perceptions regarding the tendency of life in the era of globalization in the current century, including trends in the development of the field of education.

The National Education System cannot be separated from the duties and responsibilities to provide the right answer to the responsibility to provide the right answer to the challenges and opportunities of life in the era of globalization. National Education also aims to advance the rapidly growing science and technology, all of which are scientific in nature. The development of science and technology and human efforts towards progress and overcoming environmental influences are based on scientific calculations supported by mathematics as one of the sciences. One of the subjects considered to play an important role in achieving educational goals and the development of science and technology is mathematics as a means of scientific thinking.

The development of a nation, science and technology (IPTEK) is fundamental for a nation, because it is the main factor that accelerates the process of development and progress in people's lives. The reforms that have been going on so far have changed the life of the nation and state, in the life of the state there are many supporting factors so that a country is categorized as a prosperous country and a developed country. The development and progress of a nation is marked by the progress of the development of science and mastery of technology in the development of the field of education. The field of education is very closely related to students as students who are the main subject in education. In addition, there are many other parties who are closely related to education, including teachers and teachers, schools, parents, and the community.

Among the problems that arise in the world of education, the problem of the low value of a subject by students is still a frightening specter. Why not, the values of a subject that are still considered low are seen as giving meaning to the lack of a student's level of mastery of the subject and can also be interpreted as a lack of ability of the teacher who teaches these subjects. Education is one of the factors that determine the progress of a nation and nation, because basically the progress of a country cannot be separated from human resources that act as products of education. Therefore, to improve the process of implementing education, attention must be paid to the government, both at the central and regional levels. All levels of school are forms of education, systematically designing various educational environments that provide various opportunities for students to carry out various learning activities.

Learning in schools is regulated based on a curriculum which is basically implemented in the learning process. In this era of globalization, it is highly hoped that there will be humans who can master science and technology and have good faith and piety or the existence of quality human resources. In line with that, it must be supported by the implementation of education at all levels that takes place in a sustainable and quality manner for humans. Development in the open world today and in the future requires quality human beings. Quality humans are humans who can compete in a good sense. With intense competition, individuals are needed so that the work or products produced can compete. The ability to compete by an education that is conducive to the birth of humans who have high competitiveness.

Welcoming the future era marked by open competition, with the condition of human resources (HR), the Indonesian nation will be threatened with survival if human resources (HR) are not built with advanced education programs with many significant changes. Problems should be overcome by making reforms and improvements in the field of education to compete in the global world. The Ministry of National Education tries to answer the above problems by setting content standards (SI) through the Decree of the Minister of National Education No. 22 of 2006 dated May 23, 2006. With this SI, schools were given the authority to develop the Education Unit Level Curriculum.

Students are expected to always have high mathematics learning outcomes. High mathematics learning outcomes can be determined by many factors both at school teaching and teaching outside school. The magnitude of this role can be seen from the students' mathematics achievement in mathematics subjects in junior high school (SMP). If the effort to master science and technology is to be achieved, then mathematics plays an important role because mathematical thinking is logical, analytical, and mathematical. Therefore, mathematics in the development of science and technology is increasingly needed. Thus the teaching of mathematics at various levels of education must receive serious attention. For high school students are absolutely required to master mathematics. Several attempts to improve

mathematics learning outcomes of high school students are by improving the variables that support the learning outcomes themselves. In this study only identified the group guidance variable with the learning achievement of elementary school students.

The role of mathematics in creating quality human resources, various things are done in order to improve mathematics learning outcomes including, adding learning facilities, arranging mathematics teachers, teaching mathematics training, holding teaching media and many other efforts that have been carried out by both government and by other agencies concerned in the world of education. However, the reality on the ground shows that the results of this mathematics learning will indirectly have a bad effect on improving science and technology which then results in the low quality of the resulting human beings, therefore, a solution is needed as an effort to improve it.

Students' mathematics learning outcomes are influenced by various factors, especially those that we can see directly in the learning process, including teacher factors, teaching methods, teaching materials, subject matter, educational facilities and infrastructure, and no less important is the factor of the students themselves. Factors and teachers for example teaching methods that are difficult for students to understand, teaching methods that tend to watch and are not in accordance with students' conditions, causing boredom to learn which in turn reduces student interest in learning, then subject matter factors including at least a lot, level of difficulty and the breadth and narrowness of the coverage material that is not in accordance with the allotted time. Then the next factor is from the students themselves, for example, poor activity in the ongoing learning process and in reprocessing the subject matter that has been done.

Education is held to improve human abilities simply because only humans need education among all-powerful creatures. Therefore, we say that the nature of education as a human process. Education as a process towards achieving the ideals to sustain human life for a better life. One of the institutions that play an important role in the ongoing education process is the school. In schools, the core of the educational process is the learning process.

Learning in schools has a purpose and is related to the material to be given and to the teaching and learning methods used by teachers and students in giving or receiving the material. The extent to which the teacher's success in providing the material, and the extent to which students absorb the material presented can be obtained through evaluation. A good evaluation must be based on the teaching objectives set by the teacher and then really trying to achieve it by the teacher and students. Even though the evaluation is good, if it is not based on the learning objectives given, the objectives will not be achieved.

Even though the teaching objectives are set, if these goals are not realized in the presentation of the teaching, then that goal is also useless. The link between teaching objectives, materials, and teaching and learning methods, as well as evaluation must be an inseparable bond. Assessment or evaluation as we see it, is a systematic collection of facts to determine whether in reality there is a change in students and to determine the extent of change in the student's personality. Or evaluation is a process of describing, obtaining, and presenting information that is useful for assessing the alternative decisions that have been determined.

Student learning outcomes are meaningful for all components in the learning process, especially students, of course providing information about the extent to which they have mastered the subject matter presented by the teacher. With this information students can take appropriate steps or attitudes. In this case there are two possibilities, namely: first, learning

outcomes are unsatisfactory if the evaluation results show the student has not achieved the desired instructional goals, he can be motivated to study harder and look for efforts to cover his shortcomings, but can also give hope. and learning motivation decreases or disappears altogether, both learning outcomes satisfy students, students are encouraged to repeat or even improve their results in order to obtain similar satisfaction in the future, but even now there is a possibility that students are already satisfied with the results obtained so that they do not feel motivated to learn.

It is very important to provide instructions for teachers regarding the condition of students, teaching materials, and teaching methods. Because the results obtained from these activities are the results achieved by them. Based on the instructions, the teacher can seek improvement or enrichment of student learning. Learning outcomes can also provide an overview for teachers about student learning outcomes or the teaching materials they produce. Likewise, the results of the evaluation can indicate whether or not the teaching method used by the teacher in presenting a particular material is appropriate. When learning outcomes are disappointing, there is a possibility that the teaching methods applied to the presentation of certain topics are not or have not been completed. This means that teachers are obliged to find other methods that are more suitable for teaching certain teaching materials. The meaning for supervisors or extension workers is generally directed at efforts to improve student learning outcomes and adjust students to their environment.

The success of teaching and learning activities is also determined by the learning conditions created by the school. The effectiveness of teaching and learning activities that are required, among others, by the learning conditions created by the school, obtain information through evaluation. The evaluation results obtained can be used by the school to introspect itself to see how far the learning conditions it creates help the implementation of good teaching. Meaning for parents, all parents want to see how far the level of progress achieved by their children in school, even though this knowledge does not guarantee their efforts to improve their children's progress. Therefore, every semester, the school provides a student progress report to their parents in the form of a report card. In the report card is none other than the learning outcomes made by the teacher and all school officials to the students being taught.

The development of education has a goal to improve the quality of human life universally. Besides that, education aims to create human beings who believe and are devoted to God Almighty, qualified, and independent so that they are able to build themselves and are responsible for the development of life in various fields. Efforts made by the government in achieving these goals are carrying out development in all aspects, including development in education which includes improving the curriculum, providing textbooks, providing teaching facilities and infrastructure, training education personnel, and improving the National Examination system.

The quality of education still has not received much serious attention until now, according to observations and studies on education in several countries showing various indicators that including the quality of our education has not experienced much development and progress, what has experienced a lot of improvement is that the quantity has not yet reached an increase in quality. Based on various elements of education, we can see how difficult it is to improve the quality of education with limited facilities, minimal education funds, very low appreciation for the teaching profession and the limited variety of educational support facilities.

Subjects taught at formal educational institutions include mathematics. The field of mathematics is one of the keys to mastering science and technology. However, the reality shows that students' mathematics learning outcomes are still very low compared to other subjects. This can be proven by looking at the average value of the State Mathematics Examination of students each year.

Educational institutions cannot be separated from the problem of low student learning outcomes in mathematics. Various steps have been attempted to solve this problem. The steps that have been taken by the teacher concerned include using teaching methods and techniques, all of which are expected to improve student learning outcomes. One of these methods is a rule learning type learning method which is also one of the appropriate methods to be applied. The type of learning rules (rule learning) is that students learn to combine various concepts by operating the rules of formal logic, so that students can make certain conclusions which may then be viewed as rules (principles, propositions, rules, laws, rules, and so on).

Learning a principle or a rule means we connect two or more concepts. The relationship between the two concepts can be expressed in the form that if X, then it will be Y, for example if iron is heated it will expand. This shows that learning rules means connecting concepts. Learning rules is a type of learning that is widely found in lessons at school. There are many rules that every educated person needs to know. This rule is found in each subject. Some are held, even children have to determine the rules themselves, can also be learned by telling them to students with examples and this method is shorter and no less effective. Regarding the rules without understanding them will be a verbal chain only and this only shows the wrong way of learning.

Referring to the descriptions above, various efforts have been taken by the government together with education personnel to solve the above problems, both with a psychological approach, which aims to reduce students' anxiety towards mathematics, as well as efforts to improve the learning process and others.

The development of science and technology in the field of education is an absolute guide for progress, especially with the development of forms of classroom action research (CAR which is the most up-to-date research technology, so that the authors wish to research on: "Improving mathematics learning outcomes through the application of rule learning methods to students". Class VII SMPN Walenrang, Lamasi District, Luwu Regency".

## Method

1. This type of research is classroom-based action research which includes planning, action, observation/assessment and reflection. The research was conducted at SMP Negeri 4 Walenrang involving students of class VIII with a total of 40 students. This study used 2 cycles with each cycle consisting of 5 meetings. So, learning is carried out in 5 (five) meetings. During the first week (2 face-to-face meetings), the main activities carried out were the first cycle activities. The work steps in cycle I lasted for 3 weeks (5 meetings) with several small cycles in it. The subject matter discussed in this cycle consists of the subject matter of Bangun Datar. During the first 1 week (2 face-to-face meetings), the main activities the researchers carried out were as follows:
2. Presenting the curriculum

3. Creating learning scenarios
4. Identifying the condition of students in the form of seriousness in participating in mathematics lessons, interest in mathematics and so on, all of which come from observations from the previous semester. This activity the researchers did at the beginning of the face-to-face based on the information that already existed in the previous semester.
5. At the next meeting, the researcher grouped 40 students into several groups. As a step, made 8 groups consisting of 5 students per group. A student who is considered smart is selected by group members to become group leader. The group leader also acts as a peer tutor.
6. Set the position of the student group that is adjusted to the condition of the class.
7. The researcher presents the subject matter briefly in which the presentation of the material is focused on demonstration techniques, and then gives practice questions that are relevant to students to be discussed in their respective groups.
8. During the discussion, the researcher observed the students' activities by walking from one group to another. From this observation, the researcher directs and guides each group according to the difficulties it faces.
9. At the appointed time, each group is given the opportunity to answer each item specified on the blackboard or on the assignment sheet provided. If students work on questions on the blackboard, the technique is to show them directly from the teacher or by sending one member of the group who is randomly selected by another group.
10. At the end of each lesson, each group is given 4 numbers of homework, with details of 2 numbers being done in groups and two numbers being done individually.
11. Discussing on the blackboard every question that is considered difficult by students, whether it is practice questions, homework questions or test questions.
12. When students are actively working on the given exercise assignments, the researchers observe and record student activities in the form of:
  - 1) The activeness of students in groups, in the form of active students asking their friends and the teacher or the activeness of students answering questions posed by both the teacher and their group friends.
  - 2) The ability of students to participate in learning activities, in the form of the ability of students to personally solve any given practice questions.
  - 3) Groups and cooperation that students pay attention to in groups.
  - 4) The difficulties experienced by students in solving practice questions and test questions given.
13. Furthermore, at the end of the 2nd week meeting (4th meeting), the writer gave the opportunity for each student to make a reflection from criticism, suggestions/suggestions and written anonymously, which included reflections from students on:
  - 1) The group guidance method they accept
  - 2) The group itself, regarding the members of the group, their learning activities both in groups and at home.
  - 3) Learning difficulties experienced

From the data, both in the form of scores from the initial and final tests of the first cycle as well as data from observations and reflections on the implementation of the first cycle of actions, an activity plan for the second cycle was made. The action plan is followed up with the following steps:

- 1) For the 7th point above, it is enhanced by giving co-curricular assignments to students only once a week or at the 3rd face-to-face with co-curricular activities that must be done individually. For group assignments, each subject is finished.
  - 2) Some group members are exchanged with the aim of better cooperation between students and groups.
  - 3) Give quizzes to students individually after each completion of the subject matter. By taking questions from several practice questions that are done in groups. The time for giving this quiz is first informed to students.
  - 4) At the end of the 5th meeting, students were given the opportunity to reflect on the way of learning they received with points reflected in the previous reflection.
14. Designing the next cycle which is an improvement from cycle I.
- The second cycle of activities in the second cycle lasted for 3 weeks (5 times face to face) with the subject matter discussed covering the subject matter of Bangun Datar. The activity in the second cycle is to repeat the work steps of the previous cycle which have been improved and developed according to the reflection of the cycle. the activities in this cycle are repeated in a spiral which allows for smaller cycles to occur, where each small cycle is an improvement from the previous cycle. In detail, the activities carried out in the second cycle are described as follows:
- a) Repeating the work steps (actions) point 4 to point 9
  - b) Give quizzes to students at a predetermined time. The quiz questions are taken from practice questions that have been done in groups or from homework questions that students do individually. This is intended so that students are more motivated and serious about working on the homework questions given.
  - c) In this cycle, researchers are more intensively involved directly (interference) in the guidance of groups that are considered to have difficulties in learning.
  - d) In order to have more discussion and group activity, the 6th point in the first cycle was modified. For certain questions, each student has finished working in groups, then randomly by just mentioning the serial number, the student concerned must go up to the blackboard without bringing any notes to solve the problem. For students who cannot solve the questions given on the blackboard, the students are given sanctions along with all members in their group, especially the group leader. It is better for students who are able to solve the questions given will be given praise subtly.
  - e) Motivate students about the importance of group learning in completing each given practice question.

The data collection techniques in this study are as follows:

1. Data regarding the attitudes, interests and seriousness of students in following the group guidance method were taken using observation techniques, namely observations made by the author on students who were the subject of research. This observation was made during the teaching and learning process.
2. Data on students' Mathematics Learning Outcomes are taken from the final test of each cycle.

The collected data were analyzed using qualitative and quantitative analysis techniques. For qualitative analysis used categorization techniques, while for quantitative analysis used descriptive statistics. For the type of qualitative analysis, the data to be used is categorization. The criteria used to determine the category score is a scale of five. According to Wayang Nurkencana and PNN Sunarta (in Amiruddin, 1998: 20). The fifth scale is a

division of levels which is divided into five categories, namely: mastery level of 90%-100% categorized as "very high", 80%-89% categorized as "high", 65%-70% categorized as "medium", 55%-64 % is categorized as "low" and 0-54% is categorized as "very low". Sampling in one class as a whole.

## Results and Discussion

In accordance with the stages of implementing the rule learning type of learning method, the implementation of the action begins with the presentation of the curriculum material for making learning scenarios. In presenting the curriculum, the researcher presents lessons, in this case the teacher acts as a teacher explaining the competency standards to be studied. The explanation is intended so that students' thinking is focused on the material and deepens the material by looking directly at the textbooks owned by students. This activity lasts about 15 minutes.

After the students grouped into their respective groups, the researcher then assigned students to discuss and share roles in the group democratically. During the discussion, the researcher observed student activities by walking from one group to another. From this observation, the researcher directs and guides each group according to the difficulties it faces. After that, the work of each group must be collected at the end of the lesson.

During group work activities that last approximately 60 minutes, the teacher always supervises, observes, and facilitates, especially for groups who are still having difficulty working on the flat shape questions. This activity was completed by students in two meetings.

After each group completes the problem of building a space, the next series of activities is to work on the questions on the blackboard according to their work. This group presentation activity always ends with a question and answer session. This activity is guided by a presentation format sheet that has been prepared by the teacher. The sheet is a tool for assessing student activity in presentations. The group that has completed the presentation is given practice questions and enrichment. This is intended to strengthen students' understanding while waiting for other groups who have not completed their assignments.

The activity ends with an individual test. This test is carried out simultaneously and placed in one class. The form of the test used is multiple choice questions with a time allocation of 60 minutes. The final test score is then processed to be used as an indicator of increasing student understanding as a result of learning the flat type of rule learning. From the test results obtained information that students' learning completeness reaches 95% while those who do not meet the standard of completeness reach 5%.

After the individual tests were carried out, the students were interviewed, which in this case did not increase from the initial test scores to the final test scores. Therefore, the interview material on this occasion revolves around the causes of the lack of increased knowledge. From the results of these interviews obtained some information that the absence of an increase in grades is caused by: (1) students are not used to cooperative learning (groups) so that sometimes students are confused with learning situations in their groups, (2) students feel irresponsible in completing the entire task assigned to them. given so that it is not uncommon for students to be indifferent to the assignments given, and (3) students feel awkward and inferior in starting discussions because students feel they do not have an important contribution in completing group assignments.

In addition to interviews, researchers also made observations. Based on the results of observations obtained some information, among others: (1) the atmosphere of the class is quite dynamic. Students in groups seemed quite interactive and a bit crowded but did not interfere with each other and the stability of learning went well in cooperative learning concept maps. (2) Students seem to be more active in their respective groups. However, there are also certain students who do not seem to work fast enough because there is confusion in determining the sub-concepts that must be written down. (3) Students are more daring to express their opinions both to friends and teachers who were previously afraid to express them. (4) There is a good division of tasks for each group member. However, there are still those who feel left out and just sit there doing nothing. (5) Students' activities and motivation are increasing with the implementation of this cooperative model.

Seeing the facts that occurred during learning, the researchers conducted learning reflections. The following are the results of the reflections carried out: (1) some students have shown positive attitudes in group learning, such as helping to understand the material being studied, and encouraging each other to learn. However, there are still students who find it difficult to accept the learning. Students feel awkward and somewhat confused because they feel lazy to read and cannot express their ideas in group presentations. (2) All subjects participated in learning activities in a calm and orderly manner. (3) Interaction between teachers periodically can increase students' enthusiasm for learning so that there is no bottleneck in discussion activities and concept map making in groups. (4) Students need to be continuously encouraged and motivated to ask questions, especially during concept map making and question and answer activities during presentations. (5) Learning the rule learning method is indeed good, but requires good time management so that the ongoing learning does not interfere with other lessons.

In the learning process, there are many factors that can affect learning outcomes, one of which is the approach used in learning. An approach that places students as recipients of information can minimize student activity in learning. This can be seen in the previous basic competency learning. Changes in learning patterns and learning environments that were less common for previous research subjects actually affected learning activities. During the implementation of learning at the first meeting, student activity, in this case through the rule learning type method, was still low, there were even subjects who worked alone or did nothing. Even if there is discussion, it is still in low intensity and sometimes the cooperation that is built is only limited to close friends.

The above fact is understandable considering that students have never studied with this learning model. So when they are faced with a learning situation of a rule learning type model in which there are members with heterogeneous abilities they have difficulty in implementing it so that learning is still not as expected.

Entering the second meeting, learning through the rule learning method has increased and students have the opportunity to express their ideas. They have the courage to express their opinions or ideas in groups.

The teacher in this study tries to explore and stimulate the formation of ideas, testing ideas, and mastering concepts by asking questions and posing problems that arise and trying to use the ideas that have been put forward by students and provide reinforcement in the form of

praise. However, in this learning, there are still obstacles, among others, children still feel confused and afraid to express their ideas.

In this learning, interaction between friends is seen and intimacy is seen earlier so that they can better adjust to their group friends and communication occurs. By means of communication, it also increases language skills that encourage people to think. Familiarity is a factor that supports the formation of a dynamic atmosphere of group discussion and cooperation. In this regard, Suparno (2000) states that in order for a friend's relationship to have a positive or constructive influence, they must seek an atmosphere of mutual belonging, mutual assistance, and mutual concern for one another.

In addition, the form of the task in the activity sheet also turned out to affect the intensity of the subject's direct interaction. Theoretically structured tasks can affect the group's process in achieving their work effectiveness. Such conditions provide opportunities for students to discuss, debate, express opinions, and listen to the opinions of others so as to enable them to find ways and techniques to process information in building new ideas.

The result of learning this form of assignment is more intensive activities, both discussions with groups and discussions in class, so that the class atmosphere can become more lively. These activities include sharing opinions, helping each other in learning, and encouraging friends. By being given a form of questions and assignments that require critical thinking, students can not only ask or answer questions, but also begin to appreciate contributions, use agreements, take turns, and be able to defend their ideas.

The results of the questionnaire analysis of student learning motivation given before the implementation of the action showed that the average student motivation was 2.69 with a fairly good category. This condition is, of course, influenced by various factors. The results of the analysis of the learning motivation questionnaire given after the completion of the application of learning through the rule learning method approach showed that there was an increase in learning motivation. This category shows that the application of this approach in learning mathematics can increase students' motivation to learn.

The increase in motivation as above is possible, among other things, because during the implementation of student actions, students are more visible in learning because researchers provide opportunities for students to dare to express ideas and researchers also try to stimulate students to think by providing various examples of industrial results. Students who are motivated to learn will be very interested in the various learning tasks they are doing, show high persistence, and have a greater variety of learning activities.

The results achieved by students on the final test were quite good. With this average, there are still students who have not experienced an increase in learning outcomes completely. However, in learning, the application of an approach and the use of learning methods must also pay attention to the characteristics of the subject matter.

## Conclusion

Based on the results of research and discussion, conclusions can be drawn, among others, namely the application of mathematics learning with the Rule Learning Type learning method can improve the mathematics learning outcomes of VII students of SMP Negeri 4 Walenrang Lamasi. This increase can be seen from the activities of cycle I and cycle II. Where in the first

cycle students can complete the task individually then in the second cycle students are able to answer the quiz given at an unspecified time, and students are also able to answer the questions given and done on the blackboard without looking at the notes.

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