MEAS APPROACH IN THE NHT TYPE COOPERATIVE LEARNING TO IMPROVE THE PROBLEM- SOLVING SKILL AND DEVELOP THE RESPONSIBLE CHARACTER FOR THE STUDENTS OF XI

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ABSTRACT

Problem-solving abilities of the students who are still limited to things often appear alone. They lack a sense of responsibility for what became the obligations as a student becomes a problem that became the focus of this research. This research aims to improve the ability of problem-solving and developing character of the responsibility of the student. This research is a Classroom Action Research (CAR) implemented in cycles with cycle one consists of 3 meetings. The subject is an odd semester of Class XI IPA B Islamic Senior High School (MA) Ali Masum school year 2017/2018. The data collection techniques are using observation instruments (observation), interviews, and documentation tests. Analytical techniques descriptive data is done by qualitative and quantitative. The results showed that learning mathematics with the MEAs approach to NHT type cooperative learning could improve problem-solving ability. The results of the study are presented as follows: a) the ability to understand the problem increased from 89.69% to 95.20%, b) the ability to plan the problem solving increased 71.46% to 80.21%, c) the ability to carry out procedures increased 61.46% to 71.04% d) the ability to Recheck the results increased 50.00% to 70.42%. One for the character of responsibility, there is an increase that is from 2.26 (Less Good) in cycle I to 3.37 (Very Good) in cycle II.

Keywords: Problem Solving Abilities, Responsibility Character, MEAs, NHT

INTRODUCTION

Education is one form of the embodiment of a human culture that is dynamic and full of development. Therefore, changes or developments in education are supposed to occur in line with changes in cultural life. Changes in education at all levels need to be continuously carried out in anticipation of future interests (Trianto: 2009). During this time, the government and the Ministry of National Education began to plan to develop character education in schools. Character development education is a continuous and never-ending process as long as the nation exists and wants to continue to exist (Lickona: 2013). Therefore, character education planned to be implemented must be an integrated part of education over generations. Mathematics is one of the subjects taught at every level starting from elementary school (SD), junior high school (SMP), Senior high school (SMA). (NCTM, 2000: 5) states the importance of mathematics with the following statement: In this changing world, those who understand and can do mathematics will have significantly enhanced opportunities and options for shaping their futures. Mathematical competence opens doors to productive futures. A lack of mathematical competence keeps those doors closed. In this ever-changing world, anyone who understands and is skilled in mathematics will significantly increase opportunities and choices to shape his future. Mathematical competence opens the door to a productive future. The absence of mathematical competence leaves these doors closed so that a student's success in learning mathematics opens a bright future.

Problem-solving ability is one of the skills expected to be mastered by students in learning mathematics. Problem-solving is a process for overcoming difficulties encountered to achieve the expected goals. These standard processes include problem-solving, reasoning and proof, linkages, communication, and representation. The ability to solve problems is one of the goals of learning mathematics in schools that will be achieved according to the Ministry of Education and NTCM.

From the results of an interview conducted on September 8, 2017, with one of the mathematics teachers MA Ali Maksum Krapyak Bantul, students' problem-solving ability is one thing that must be

considered. In some instances, students' problem-solving abilities are limited to a problem that some instances, but if a different problem arises, then students will experience difficulties. The next problem is students' sense of responsibility towards the teacher's assignments and instructions during the teaching and learning teacher's g process, from the ew with mathematics teacher MA Ali Maksum Krapyak. When giving assignments in the form of practice questions, the teacher states there are still students who are just waiting for their friends to work on and then copy their friends' work.

We need treatment or action that supports students in improving problem-solving skills and developing student responsibility from the problems above. In this study, researchers used the MEAs approach in collaboration with NHT type cooperative learning. MEAs are learning approaches to understanding, explaining, and communicating the concepts in a problem through mathematical modeling stages. Chamberlin (2005: 4) also states that the Model-Eliciting Activities approach is an extension or development of a problem-based learning approach. The MEAs approach is a learning approach that begins with presenting problem situations that give rise to activities that produce mathematical models used to solve mathematical problems.

Richard Lesh (2003: 43-44) says that there are six principles in developing them in the cycle of modeling activities. The six principles include the personal meaningfulness principle, the model construction principle, the self-evaluation principle, the model documentation principle, the simple prototype principle, and the model generalization principle. Permana (2011: 77-78) suggests the stages of the MEAs approach are as follows: a) identifying and simplifying problems, b) building mathematical models, c) transforming and solving models, d) interpreting models.

While NHT is a type of cooperative learning designed to influence student interaction patterns and alternatives to traditional classroom structures (Trianto, 2009: 82). Another opinion expressed by Daryanto (2012: 245) that in general, NHT is used to involve students in strengthening understanding of learning or checking students' understanding of learning materials. The steps of NHT learning according to Ridwan Abdullah Sani (2015: 188) are as follows: 1) Students are divided into groups, each student in each group gets a number, 2) The teacher gives the assignment, and each group does, 3) Group discuss the correct answers and ensure each group member can work out / know the answers, 4) The teacher calls one of the student numbers with the number called to report the results of their collaboration, 5) Responses from other friends are accommodated, then the teacher designates another number, 6) Conclusions. Problem-solving is seen as a process of finding a combination of many rules that can be applied to overcome a new situation. Problem-solving is not just a form of the ability to apply rules. However, instead, it is a process of obtaining a set of rules at a higher level (Wina, 2011: 52). Other terms related to responsibility include Mu'in (2011: 216-217): a) Duty (task) means what has been given to us as an assignment we have to do it, b) time management (time management) means the person responsible is usually a person who can manage time and be consistent with a predetermined schedule, c) reaching goals (goals to be achieved) means the goals to be achieved together. This is the responsibility of the person who has set goals and must be responsible for doing something so that goals can be achieved. Because once a goal is set, it takes work to prove that someone must be serious about achieving it, d) diligence (meaning diligence) means that the diligent and diligent person is usually the person responsible. When doing something lazily when the goal to achieve something has been set, and work standards to achieve it can be measured, he is a person who is not responsible, e) teamwork means that people who deviate from the team's agreement and want to take advantage to himself from the activities with the team is a person who is not responsible, f) contracts (contracts): the agreement that must be followed and also violate not responsible, g) rational (things that make sense) means that the person responsible is saying something that makes sense, does not spit lies and irrationality.

Individual responsibility means a person who dares to do, dares to be responsible about all the risks of his actions Directorate of Education Personnel (2007: 6) which includes: a) Completing all tasks and exercises for which he is responsible, b) carrying out instructions as well as possible during the learning process take place, c) can set a predetermined time, d) serious in doing something, e) Focused and consistent, f) not cheating, g) diligent and persevering during the learning process takes place.

Social responsibility means that all deeds done by a person must have thought about the consequences or benefits for others, the community, and the environment Directorate of Education Personnel (2007: 6), including a) being cooperative., B) Expressing appreciation and being grateful for the efforts of others, c) help friends who are having difficulty learning.

In this study, researchers used indicators of problem-solving ability according to the Polya, namely: (1) understanding or identifying problems, (2) compiling a settlement plan, (3) solving problems, in this case, carrying out a settlement procedure, (4) rechecking the results or solutions obtained. Responsibility emphasizes the positive obligation to protect each other (Likcona, 2013: 72). According to Zuchdi (Yasmin, 2016: 693), responsibility is an attitude and behavior of an individual in carrying out the duties and obligations that must be carried out, both duties towards God, the State, the environment, and society and on himself. Indicators used to measure the development of the character of student responsibility are as follows: a) students complete all the tasks that become their responsibility, b) carry out instructions as well as possible during the learning process, c) be cooperative in learning, d) can manage the time spent given, e) focuses on the activities of teaching and learning, f) obeying rules that have been adjusted, g) persevering during the learning process, h) helping friends who are struggling, i) not cheating during tests, j) expressing respect and being grateful to others.
This study aims to improve the ability of problem-solving and develop the character of the responsibility of students of class XI IPA B MA Ali Maksum on row and series material.

METHODS

This type of research is CAR (Classroom Action Research). The research subjects were students of class XI IPA B MA Ali Maksum in 2017/2018, amounting to 32 people. This research was conducted in 2 cycles with one cycle of 3 meetings. Each cycle consists of planning, implementing, observing, and reflecting. Data collection techniques using observation instruments, tests, and interviews. Observation is used to observe the development of the character of student responsibility. The test instrument is used to measure students' problem-solving abilities according to the Polya step. After obtaining data, quantitative and qualitative analyzes are carried out. Furthermore, the results of data analysis for problem-solving ability are categorized in the following table:

Table 1. Percentage of Problem Solving Capabilities

Score	Qualification
$85\% \leq x \leq 100\%$	Very good
$70\% \leq x < 85\%$	Well
$55\% \leq x < 70\%$	Enough
$40\% \leq x < 55\%$	Less
$x < 40\%$	Very less

(modifikasi Japa,2008:67)

For the character of responsibility, categorized in the following table:

Table 2. Achievement Categories of Character Responsibility Achievement

Score	Qualification
$3{,}20 \leq x \leq 4{,}00$	Very good
$2{,}80 \leq x < 3{,}20$	Well
$2{,}40 \leq x \leq 2{,}80$	Enough
$x < 2{,}40$	Less

For scoring rubrics, the problem-solving ability is presented in the following table:

Table 3. Guidelines for Scoring Test Weights

Score	Understand the problem / identify the problem	Make a solution plan
0	Do not write down information that is known and asked in the matter	There is no planning in solving the problem
1	Incorrect writing of known information	Incorrect planning of solutions
2	There was an error writing down the information that was known	There was an error in planning the solution
3	Write down information that is known and asked correctly	Make a plan by the information provided correctly
	Max score: 3	Max score: 3

Score	Problem-solving procedure	Re-check results
0	Not doing a calculation process or procedure in solving problems	no checking or checking of the results obtained
1	Carrying out procedures that are wrong or not by existing procedures.	Incorrect checking of results
2	There was an error in completing the procedure	There was an error checking the results again
3	Carry out procedures that are appropriate and correct	Perform a correct check on the results
	Max score: 3	Max score: 3

RESULTS AND DISCUSSION

For the percentage of problem-solving abilities in the first cycle according to the Polya step presented in the following table: The percentage of students 'ability to understand or identify problems reached 89.69% and classified as very good, the percentage of students' ability to plan problem-solving strategies reached 71.46% and classified as good, the percentage of students 'ability to carry out problem-solving procedures reached 61.46% and classified as sufficient, the percentage of students' ability to interpret or check results reached 50.00% and classified as less. The results of observing the character of responsibility obtained results in 2.26 (Poor). Before the research continues to cycle II, researchers prepare several actions to improve cycle II's learning process. Some of the actions are as follows: 1) Conveying the importance of doing assignments such as doing the assignment and collecting it on time will provide its additional value, 2) Give directives or instructions as clearly as possible and repeat them if there are still confused students, 3) Give a little motivational story about dynamic and consistent nature will give effect to future lives, 4) Firm in giving time to students in completing the things that become their duties, 5) Explaining the function of cooperative learning including so that one of the members experiencing difficulties can directly ask questions with a group of friends, 6) Applying the nature and honest attitude in everything that characterizes a student.

Based on the analysis of the second cycle's written results, the percentage of students 'ability to understand or identify problems reached 95.21%. It was classified as very good, the percentage of students' ability to plan problem-solving strategies reached 80.21% and classified as good, the percentage students 'ability to carry out problem-solving procedures reached 71.04% and classified in the excellent category, the percentage of students' ability to interpret or check results reached 70.42% and classified in the good category, for the results of observing the character of the responsibility obtained 3.37 results (Very Good).

CONCLUSION

From the results of the discussion, it can be concluded that the application of the MEAs approach to NHT type cooperative learning can improve problem-solving abilities and develop the character of student responsibility. This is evident from the test results of problem-solving abilities based on the Polya step has increased from cycle I to cycle II. In addition to the character of student responsibility also develops, an increase in the assessment of every aspect or indicator observed in this study is seen. The researcher hopes that this research can continue, and applying the MEAs approach to NHT type cooperative learning can be a solution to improve students' problem-solving abilities.

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