Efforts to Increase The Students' Level of Confidence in Mathematics Learning Using Numbered Head Together (NHT) Model

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Abstract

This study aims to improve the students' confidence through the Numbered Head Together (NHT) learning model in learning mathematics in class VIII D of SMP N 3 Depok. This research is a classroom action research (CAR) using NHT model. The stages in this study consist of planning, action, observation, and reflection. The research subjects include 32 students. The data collection techniques used are a test, questionnaires, and observation. The data collection instruments used are written tests to measure the students' cognitive learning outcomes, self-confidence questionnaire, and observation sheets to determine the feasibility of learning using the NHT technique. The data analysis technique uses percentages for the learning outcomes using observation sheets, data analysis of descriptive study completeness describing individual and group students' outcomes, and scoring for self-confidence questionnaire using Likert scale with five criteria intervals. The results of the analysis of this research indicate that mathematics learning increases student confidence by 10.22%. The students' outcomes (cognitive) have decreased, and one of them is the learning material that is more difficult than the cycle I. The basic competence for cycle I is to complete SPLDV (Sistem Persamaan Linear Dua Variabel) while for cycle II, the basic competence is to make and complete mathematical models of problems related to SPLDV. The implementation of learning using the NHT learning model has increased from 81.3% in the first cycle to 96.9% in the second one. It can be concluded that the NHT cooperative learning model is proven to improve the students' confidence.

Keywords: mathematics learning, numbered head together, self-confidence

INTRODUCTION

Education is an important thing in human life, where it can change the mindset of a human being to always make innovations and improvements in all aspects of life toward improving the quality of self. In formal education, the implementation of education is inseparable from the educational objectives that will be achieved because the achievement of educational objectives is a benchmark of the success of education. The objectives of national education are adjusted to the demands of the development and growth of the Indonesian people so that the objectives are relatively dynamic. Mathematics education itself has a very important role because mathematics is a basic science that is widely used in various fields of life. In BSNP (Badan Standar Nasional Pendidikan, 2006), it is stated that not only cognitive aspects are the objectives of mathematics learning, but also the affective ones, including self-confidence.

According to Reddy (Kunhertanti & Santosa, 2018), self-confidence is an attitude

that allows individuals to have positive yet realistic views of themselves and their situations. The self-confidence of people trust their abilities, have a general sense of control in their lives, and believe that, within reason, they will be able to do what they wish, plan, and expect. While according to Willis (Ghufron & Risnawati, 2014) self-confidence is the belief that someone can cope with a problem with the best situation and can provide something pleasant for other so that people who have high confidence will be able to solve a problem well.

Likewise in the opinion of Lauster (Ghufron & Risnawati, 2014) that confidence is obtained from life experience. Self-confidence is one aspect of personality in the form of a belief in one's ability so that it is not influenced by others and can act according to the will, happy, optimistic, tolerant, and responsible. The same thing was also expressed by Ghufron & Risnawati (2014) that self-confidence is the belief to do something about the subject as personal characteristics in which there is a belief in the ability of self, optimistic, objective, responsible, ration, and reality.

Speaking of beliefs, according to McLeod (1991) beliefs are divided into two parts, namely beliefs about mathematics and beliefs about oneself. According to Scoenfeld (Hannula et. al., 2004), belief is the understanding and feeling of an individual that shapes the ways and concepts of individuals involved in mathematical behavior. Hannula et. al. (2004) argue that mathematics learning is influenced by students who have confidence in their abilities, especially self-confidence.

Being confident is very important for every student because it allows them to be more confident in performing their potential that exists within them, not easily give up and despair in facing any problems so that they can complete all the tasks given independently with maximum results. This is supported by the opinion of Preston (2001) who argues that

"*your beliefs about your capacity to achieve, solve problems, and think for yourself. This is what I mean by confidence.*" The description implies that confidence is one's belief about his ability to achieve a goal, solve a problem, and think for himself. People who have strong confidence can complete the tasks by following the stages of development properly or at least have the ability to learn ways to complete these tasks to foster courage and the ability to improve the achievement.

From the results of preliminary observations made at SMP N 3 Depok, the confidence of VIIID grade students is still quite sufficient with an average of 82.34%. There is no percentage for very high criteria (0%), 9%, for high criteria, 56% for medium criteria, 16% for low criteria, and very low criteria as much as 19%. From the data, it appears that there are still many students who have a very low and low level of self-confidence. Meanwhile, those who have very low and low self-confidence will affect their achievement. The low cognitive level of the students causes a decreased level of their confidence. The low cognitive learning outcomes affect the students' confidence in solving problems and achieving the objectives.

To overcome this issue, the roles of the teachers are strongly required needed because they are very influential in the learning process. In the teaching and learning process, it is expected that learning can take place interactively, inspirational, fun, challenging, motivating to participate actively, as well as providing sufficient space for initiative, creativity, and independence according to the students' talents, interests, and physical and psychological development (Depdikbud, 2013). To increase the students' confidence level, an appropriate learning method is needed, namely cooperative learning with the NHT (Numbered Head Together), which aims to increase the confidence and study the materials to achieve optimal learning outcomes. According to Suwarno (2010), the

NHT approach can provide opportunities for the students to use the skills of asking, discussing, and developing leadership talents. It is expected that with NHT, the students 'affective abilities, especially the self-confidence, can be improved well. There are four steps in implementing the NHT method, namely: numbering, questioning, thinking together, and answering (Arends, 2008). This research is different from existing research although the variables studied and the methods used in this study are the same, but the research subjects and the material used in the study must be different.

METHODS

In this research, the researcher applied the classroom action method. The focus of this research was to increase the students' self-confidence level. The research was conducted according to the schedule of mathematics lessons in class VIII D of SMP Negeri 3 Depok located in Sopalan Village, Maguwoharjo, Depok District, Sleman Regency, Yogyakarta. It involved 32 students of class VIII D.

Mathematics learning is carried out using the cooperative learning model of Numbered Head Together (NHT). The stages of this research consisted of four steps, namely planning, action, observation, and reflection. The first stage is planning, some things that must be done by researchers are reviewing the steps of learning with the NHT method, observation students' initial abilities, preparing RPP (Rencana Pelaksanaan Pembelajaran) and LKS (Lembar Kerja Siswa), and making research instruments.

Action, the second stage of this research is the implementation of the learning process with the SPLDV (Sistem Persamaan Linear Dua Variabel), which is in accordance with the learning plan guided by the RPP that has been prepared at the planning stage. At this stage, the subject teacher acts as a facilitator.

Observation, at this stage the researcher makes observations on going learning by using an observation sheet of the implementation of learning. And the last stage is a reflection. At this stage all activities that have been carried out are evaluated for improvement of activities in the next cycle until they reach a predetermined indicator of success, namely student confidence reaches a high average. Besides that, at this stage researchers and subject teachers study the deficiencies and obstacles that arise during the teaching and learning process so that alternative solutions to problems that arise in each teaching and learning process can be obtained, and can make improvements for the implementation of the next cycle.

The data were collected through the test, questionnaire, and observation methods. The test was used to collect the data on the students' cognitive learning outcomes, while the questionnaire was used to collect the students' level of confidence, and the observation was to collect learning literacy data with the Numbered Head Together (NHT) cooperative learning model, both the implementation of learning by the teachers and the students' activities.

The data collection instruments in this research were written tests in the form of multiple-choice to measure the students' cognitive learning outcomes, self-confidence questionnaire, and observation sheets to determine the feasibility of the learning using the NHT cooperative learning model.

The data analysis technique in this research used the percentage for the learning process using an observation sheet with the following formula

$$\% = \frac{\text{score obtained}}{\text{maximum score}} \times 100\%$$

The learning was said to be successful when it met 85% of the criteria. If the implementation was not in accordance with what had been expected, the evaluation would be carried out,

and changes should be made in the next learning cycle.

The analysis of learning completeness data descriptively illustrated the acquisition of the students individually or in groups. The individual analysis was carried out with the achievement of minimum standard criteria (KKM) set by the mathematics teacher, which was a minimum of 75 with the following formula

$$KK = \frac{X}{Z} \times 100\%$$

Note:

KK = Classical completeness

X = number of students obtaining score > 75

Z = total number of students

The scoring classification for the confidence questionnaire was done using a Likert scale by making intervals into 5 criteria, namely, strongly agree, agree, doubt, disagree, and strongly disagree. To determine the criteria for the confidence, first, look for the values of MI (Mean Ideal) and SDI (Standard Deviation Ideal). The following were the criteria for the confidence questionnaire according to Azwar (2013).

Table 1. Criteria of Confidence Questionnaire

Interval	Score (X)	Criteria
Mi + 1,5Si < X ≤ Mi + 3Si	120 < X ≤ 150	Very High
Mi + 0,5Si < X ≤ Mi + 1,5Si	100 < X ≤ 120	High
Mi - 0,5Si < X ≤ Mi + 0,5Si	80 < X ≤ 100	Medium
Mi - 1,5Si < X ≤ Mi - 0,5Si	60 < X ≤ 80	Low
Mi - 3Si ≤ X ≤ Mi - 1,5Si	30 ≤ X ≤ 60	Very Low

Note:

Mean Ideal (MI) = $\frac{1}{2}$ (ideal maximum score + ideal minimum score)

Standard Deviation Ideal (SDI) = $\frac{1}{6}$ (ideal maximum score - ideal minimum score)

X = total actual score

RESULTS AND DISCUSSIONS

Cycle 1

This class action research is carried out as an effort to increase the students' level of confidence in the mathematics learning with the topic of SPLDV (Sistem Persamaan Linear Dua Variabel) by applying the NHT (Numbered Head Together) Cooperative Learning model. This research is conducted within two cycles in seven meetings. The Cycle I consist of three meetings, and at the end of the cycle, an evaluation is done. The implementation of the first cycle for the first, second, and third meetings is carried out based on the lesson plans that have been prepared according to the NHT learning model.

The activities in the first cycle consisted of four stages, namely the planning stage where in this stage the researcher made initial observations about student confidence and obtained student confidence data classified as sufficient with an average of 82.34% with details of 19% of students having very low confidence criteria, 16% of students have low self-confidence criteria, 56% of students have sufficient self-confidence criteria, 9% of students have high self-confidence criteria, and no students have very high self-confidence criteria. Furthermore, the researcher examines the steps of learning by the NHT method, arranging RPP, LKS, and instruments used in the study consisting of self-confidence questionnaires, evaluation questions, and observation sheets of the implementation of learning.

The second stage is the implementation of the actions carried out in 3 meetings each lasting for 80 minutes. The subject discussed at the first meeting on Persamaan Linear Dua Variabel (PLDV), identify Sistem Persamaan Linear Dua Variabel (SPLDV), the difference between PLDV and SPLDV. Meanwhile, the second meeting discussed completing SPLDV using the graph and elimination method, while the third meeting discussed completing

SPLDV using the substitution method and the combined method (elimination-substitution).

The third stage in this study was observation, where in the first cycle, namely from the first meeting to the third meeting there were some shortcomings, namely in the introduction of motivational learning about the importance of SPLDV learning not being implemented (occurring in the first and second meetings), in the core activities section providing opportunities in other groups with the same number to respond to the results of the group presentations that advanced in front of the class did not take place (occurred at the first meeting) and the teacher did not get closer to each discussion group (occurred at the first and second meeting), at the closing activity the teacher did not summarize/summarize the learning that has been done and the reflection activities have also not been implemented (occurred at the first meeting).

The implementation of learning using the NHT method in the first cycle is 75%, the second meeting is 87.5%, and the third meeting is 81.3% so that the average percentage of the implementation of this first cycle learning is 81.3%.

At the end of the cycle, an evaluation is carried out and an average grade of 80.31 is obtained with 75% mastery learning percentage. The highest score obtained is 100 by 9 students, while the lowest score is 30 by two students. Out of 32 students, 25 students obtain the scores above the minimum criteria and 5 students obtain the scores below. Because the target percentage of mastery learning in this study is 75%, the first cycle of the research has met the expected target.

From the results of confidence questionnaire in the first cycle, 9.375% of 32 students have confidence in the very high category, 31.25% in the high category, 50% in the medium category, 6.25% in the low category, and 3.125% have confidence in the very low category. The average percentage of the students' self-confidence for the first cycle

is 90.03% which is classified as sufficient. The implementation of the first cycle learning process is equal to 81.3%. Because the target value in this study is 85%, the first cycle research does not yet meet the target and must be continued to the second one.

Cycle II

The second cycle of this research consists of two meetings and ends with an evaluation. The learning process in cycle II is carried out like cycle I which consists of four stages, where the first stage is the planning stage. In this stage the researcher lists the deficiencies that exist in the first cycle and plans improvements based on the deficiencies found in the first cycle, arranging learning tools in the form of lesson plans and worksheets as well as the instruments used in the study. The second stage is the implementation of the actions carried out in 2 meetings each lasting for 80 minutes. The subject discussed at the first meeting was about making and completing mathematical models of everyday problems related to SPLDV.

The next step is observation. Based on the observer, the learning process in cycle II has been running according to the learning scenario. The results of observations of the implementation of learning using the NHT method in the second cycle was 93.75% and in the second meeting 100%, so that the average percentage of learning in the second cycle was 96.875%. The last stage is a reflection where the learning process and affective outcomes of students in the form of student confidence in the second cycle both at the first meeting and the second meeting have improved better.

From the results of the evaluation of cycle II, it is obtained an average value of 77.19, with the mastery learning percentage of 65.625%. The average value in the first cycle is higher than the second cycle as well as the higher learning completeness in the first cycle. This is because the basic material/competence for the second cycle is more difficult than the

first one. From the results of the confidence questionnaire, 21,9% of students are in the very high category, 46.88% is in the high category, and 31.25% is in the medium category, and 0% for the low and very low categories. The average value of the students' self-confidence questionnaire in the cycle II is higher than in the cycle I.

In the first cycle, 90.03% of students are classified as medium, while in cycle II, it is found that 100.25% is classified as high. The average feasibility of cycle II is 96.9%.

Because the target is 85%, the results of cycle II have not yet met the target. So, the researcher concludes that learning mathematics using Numbered Head Together (NHT) cooperative learning model can increase the students' level of confidence in class VIIID of SMP Negeri 3 Depok.

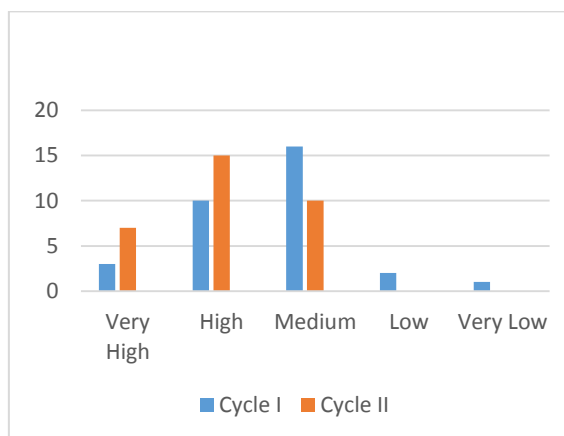The following is a confidence bar diagram of class VIIID students of SMP N 3 Depok.

Figure 1. The Self-Confidence Bar Diagram of VIIID Grade Students of SMPN 3 Depok

Connections between the Cognitive Learning Outcomes and Self-Confidence and NHT Cooperative Learning Model

Confidence is one's belief about his ability to do something/perform certain skills (Adywibowo, 2010). According to Pangestika (2018), self-confidence makes the students feel worthy, have the ability to live their life, consider various choices, and make decisions to complete assignments based on the stages of development. The research conducted by Komara (2016) through Pearson correlation analysis shows that the relationship between self-confidence and learning outcomes obtained sig. 0,000, so it can be concluded that there is a positive relationship between self-confidence and learning outcomes. The research shows that self-confidence can improve the outcomes, in this case, is the students' learning outcomes.

Suprijono (2011) revealed that the learning outcomes are some abilities possessed by the students after they experience their learning experiences. The results of the research conducted by Ubaidillah from the State Islamic University (UIN) of Syarif Hidayatullah Jakarta showed that the cooperative learning model of Numbered Head Together influences the students' learning outcomes in Physics. This is based on the t_{count} of 2.88 and t_{table} of 2.02 at the significance level $\alpha = 0.05$ for dk 78. Because $t_{count} > t_{table}$, the effect is very significant. Thus, there is a strong influence of the NHT method on the students' learning outcomes on Physics lesson.

Based on research conducted by Pujiyanti (2017) the use of the NHT cooperative model can increase student confidence through the learning steps undertaken. Students are confident when working on problems in front of the class. The percentage of students who were confident working on problems in front of the class before using the NHT cooperative model was 27.72%. After using the NHT cooperative model the percentage of students who were confident working on the questions in front of the class was 81.81%.

CONCLUSIONS

The application of the Numbered Head Together (NHT) Cooperative Learning model in mathematics learning can increase the students' level of confidence by 10.22%. The

(cognitive) students' outcomes have decreased due to some factors, and one of them is the learning materials that are more difficult than the cycle I. The basic competence of the cycle I is to solve Sistem Persamaan Linear Dua Variabel (SPLDV), while for the cycle II the basic competence is to make and complete mathematical models of problems related to SPLDV. The implementation of learning using the Numbered Head Together (NHT) Cooperative Learning model has increased from 81.3% in the first cycle to 96.9% in the second one and has met the expected target because the target in this research is 85%.

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