

**THE EFFECT OF NUMBERED HEAD TOGETHER (NHT) INTEGRATED PROBLEM BASED LEARNING (PBL) LEARNING MODEL ON IMPROVING CRITICAL THINKING AND STUDENT LEARNING OUTCOMES IN CLASS X ECOSYSTEM MATERIALS SMA NEGERI 11 AMBON AND SMA NEGERI 13 AMBON**

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**ABSTRACT**

PBL and NHT learning models that have been integrated by this researcher are an amalgamation of the two learning models to help students develop a deep understanding of systematic knowledge simultaneously and train their critical thinking skills. This study aims to determine the effect of the integrated Numbered Heads Together (NHT) Problem-based learning (PBL) learning model on improving critical thinking and student learning outcomes. The type of research used is quantitative analysis research. The population of this study were all students of class X SMA Negeri 11 Ambon and all students of class X SMA Negeri 13 Ambon. The sampling technique used was random. Data analysis using simple linear regression test. The results of the regression analysis showed that there was a significant influence between the NHT-integrated PBL learning model on critical thinking and learning outcomes. The magnitude of the influence of the NHT Integrity PBL model on critical thinking is 81.1% and student learning outcomes are 61.7%. Whereas in SMA N.13 Ambon the magnitude of the influence of the NHT Integrity PBL model on critical thinking was 55% and student learning outcomes were 79.5%. Conclusion. There is a significant influence of the NHT integrated PBL learning model on critical thinking, namely 0.001 in SMA N. 11 and 0.040 in SMA N.13 Ambon, there is a significant influence of the NHT integrated PBL learning model on learning outcomes, namely 0.001 in SMA N. 11 and 0.002 in SMA N.13 Ambon.

**Keywords:** *integration, learning, critical, thinking.*

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**INTRODUCTION**

Education is an integral part in the development of the world of education, because education is one of the benchmarks for the progress of the nation. The quality of education in Indonesia is considered low by many groups as seen from several indicators, one of which is graduates from schools or tertiary institutions who are not ready to enter the world of work due to their lack of competence. Teachers need to be creative and innovative in order to achieve optimal learning outcomes to improve the quality of the teaching and learning process in the classroom (Kunandar, 2013). Learning is essentially a process of communication and interaction between teachers and students. The importance of a fun learning process as an effort to improve student learning outcomes. One of the implementers of achieving quality education is the teacher, this is because the teacher needs to change the attitude and pattern of learning that is carried out because until now the weakness of the learning process is still a problem in the world of education. According to Sanjaya Wina (2007) One of the problems faced by the world of education is the problem of weak learning processes. Biology must be introduced and presented in everyday life for students at every opportunity, biology learning should begin with an introduction to problems that are appropriate to the situation. Lack of student interest

in participating in biology lessons, thus making students less active in participating in the learning process and having an impact on student learning outcomes.

Biology learning is still teacher-oriented so students are less actively involved in learning, problem-solving skills and less critical thinking. Related to these problems, teachers need to develop innovative learning models such as Problem Based Learning (PBL) and Numbered Head Together (NHT) so that students learning biology can think more critically and can improve student learning outcomes. Problem-based learning (PBL) is problem learning as the first step in gathering and integrating new knowledge (Gunantara et al, 2014). stated that problem-based learning is a learning model that involves students in solving real problems. With this learning model, students learn to solve problems in biology material. Therefore, the problem-based learning model can be used as a solution for teachers in the learning process to improve problem-solving skills in biology learning processes. The Numbered Head Together (NHT) cooperative learning model creates a conducive environment for developing performance skills when students go through the Problem Based Learning (PBL) learning process. In addition, students taught through the application of a combination of the PBL and NHT models assigned to heterogeneous study groups were able to establish interpersonal interactions with different knowledge and backgrounds. Students are challenged to select the best materials and solutions for cooperative real-life problem solving in PBL and NHT learning environments, and draw ideas on worksheets. In this way, students find new ways to represent and generalize their experiences (Siew et al, 2017).

The learning model another factor that needs to be considered in the process of achieving better learning outcomes is students' critical thinking skills. Students should be expected to be able to design an idea or ideas that are able to connect, assess and consider an event, so that these students gain knowledge. Critical thinking according to Mustaji (2012), means everything that has reasons related to conveying a focus on making decisions about what to believe or not. Students who have critical thinking skills will be able to ask the right questions, provide effective and efficient information, have reasonable, creative reasons, combine relevant solutions, make decisions and have consistent and credible conclusions (Carter et al, 2016). Based on observations that have been made at two high schools in the city of Ambon, one of which is SMA Negeri 11 Ambon. Through interviews with biology teachers, it was revealed that many students were still afraid to express opinions in front of their friends because students lacked confidence, students gave up too quickly when given a difficult question, students could not relate concepts and thoughts, and most students only focused at the beginning of learning. In addition, the learning model used is conventional and when the teacher explains guessing material.

## METHOD

This type of research used is quantitative research. This type of research was a quasi-experimental study consisting of two schools, each school being divided into 2 classes, namely the experimental class and the control class. Data collection used student learning outcomes tests with multiple choice questions while data for critical thinking skills tested using essay questions. Student responses to learning models using questionnaire data. Multiple choice questions total 20 questions while essay questions totaled 10 questions which had previously been validated by a team of experts. The learning outcomes test is given twice, namely before and after. The student response questionnaire contains 10 statements using a Likers scale of 1 to 4 and is given at the end of the learning meeting. The data analysis technique used is the analysis of critical thinking instruments and learning outcomes as well as the learning model questionnaire instrument. Analysis of research data to use a simple linear regression test.

## DISCUSSION RESULT

The results of the linearity test of the research data found that both classes had class X Madrasah Aliyah 3 as the experimental class, class X Madrasah Aliyah 4 as a class and at SMA N.11 and SMA N.13 Ambon can be seen in the table below:

Table 1. Results of the Linearity

ANNOVA Table		F	Sig.
Critical thinking* Model PBL Integration NHT	Between Groups (Combined)	19.498	.000
	Linearity	179.079	.000
	Deviation from Linearity	1.767	.128
	Within Groups	.465	
Total			
Learning outcomes*		10.001	.000
	Deviation from Linearity	33.000	.000
		2.335	.094

The application of the integrated numbered head together (NHT) problem based learning (PBL) learning model is only applied to the experimental class, namely class SMA N.11 and SMA N.13 Ambon, using a conventional learning model (lecture), so that in this way the effect of the learning model applied by researchers can be seen find out the integrated numbered head together (NHT) problem based learning (PBL) learning model is suitable for use, the researcher questionnaire that has been validated by the questionnaire validator and also the researcher gives each student to provide responses to the learning model. Based on the results of the linearity test at SMA N.11 and SMA N.13 Ambon it is known that the value of Sig. Deviation from linearity  $> 0.05$ ,

The learning model in PBL and NHT that has been integrated by this researcher is an amalgamation of the two learning models to help students develop a deep understanding of systematic knowledge simultaneously and train their critical thinking skills. This learning model is also student-centered which involves all students' abilities in solving a problem, investigating systematically, critically, and more actively so that students can formulate their findings with confidence (Sanjaya, 2017). Applying the integrated numbered head together (NHT) problem based learning (PBL) learning model greatly influences the learning process in class, with evidence that critical thinking and student learning outcomes increase. The application of the problem based learning (PBL) learning model combined with numbered heads together (NHT), makes students not only discover new knowledge from problem solving, but also requires student activeness during questions and answers so that learning becomes fun. Applying the integrated numbered head together (NHT) problem based learning (PBL) learning model greatly influences the learning process in class, with evidence that critical thinking and student learning outcomes increase.

The ability to think critically and the learning outcomes in the experimental class were higher than critical thinking and the results in applying the integration of NHT learning strategies into learning models that can make students have a great sense of responsibility in their groups to be able to better understand the concepts they are learning in order to maintain the good name of their group. The application of the NHT strategy integration in the PBL learning model and the application of the PBL learning model can improve student learning outcomes on acid-base subjects because students are more actively involved in their group learning. Students are asked to participate actively when discussing the LKPD given by the teacher in their group. Students are divided into several groups heterogeneously, where this will make it easier to organize and understand the material to be studied. The formation of groups in this study was carried out by students with the help of teachers to ensure heterogeneity of group membership. When students discuss the role of the teacher as a facilitator, then a group draw is carried out using the learning strategy used by researchers, namely the NHT strategy where the group whose lottery number is pulled out is asked to present the results of the discussion, and a re-draw is carried out for other groups, where this other group is asked to respond to what has been presented by the presenter. Students who will represent their groups in presenting the results of the discussion will draw their head numbers by the researcher, so that when presenting the results of group discussions, not only students who have high scores present the results of the discussion, but all students will get an opportunity or opportunity to present the results of their group discussion. Furthermore, researchers and students discussed LKPD questions that were considered difficult. NHT strategy integration activities in the PBL learning model are carried out at each meeting

The stages of the PBL learning model combined with the NHT strategy begin with the first stage, namely the student orientation stage towards the problem. Orienting students to real problems in life is one stimulus so that students get more skills than the knowledge they memorize themselves. The next stage is organizing students to study where at this stage students have sat in their groups and the teacher will give to students where asked to read and understand the instructions. The next stage is guiding individual and group investigations. Where at this stage the teacher encourages students to collect appropriate and relevant and clear information so that students can solve the problems being investigated. In accordance with the statement of general guidelines for the development of teaching materials compiled by the Ministry of National Education (2008) is an extension of student activity sheets which are sheets containing assignments (Trianto, 2012). The average score obtained by students in the experimental class at SMA N.11 Ambon has an average critical thinking score of 81.40 and 87 learning outcomes while the average score in the control class for critical thinking is 76 and an average learning achievement score of 79.57 so that it can be concluded that critical thinking skills and student learning outcomes are higher in the experimental class. The average score obtained by students in the experimental class at SMA N.13 Ambon had an average critical thinking score of 82.11 and learning outcomes of 86.86 while the average score in the control class for critical thinking was 75.08 and the average learning achievement score was 78.14 so it can be concluded that the experimental class at SMA N.13 Ambon was higher than the control class. This is because the learning model applied to the experimental class is more interesting and not monotonous, thus making students more active in the learning process in class. Teachers are very influential on critical thinking and student learning outcomes, if

only applying the lecture learning model, students only receive information from the teacher and student activities become passive.

## CONCLUSION

1. The integrated numbered head together (NHT) problem based learning (PBL) model influences the critical thinking of SMA N. 11 and SMA N. 13 Ambon students, this is evidenced by a significant value of 0.000 at SMA N.11 and 0.001 at SMA N.13 Ambon
2. The integrated numbered head together (NHT) problem based learning (PBL) learning model influences student learning outcomes at SMA N. 11 and SMA N. 13 Ambon, this is evidenced by the significant value of 0.000 at SMA N.11 and 0.000.

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