

## **ONLINE PEER TEACHING WITH PROBLEM BASED LEARNING: THE EFFECT FOR STUDENTS' MATERIALS UNDERSTANDING AS A TEACHER CANDIDATES**

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### **ABSTRACT**

This research is an experimental study with one group pre-test - post test design. This study purpose was to determine the effect of the application of online peer teaching with a problem based learning model for understanding material of students as a teacher candidate. The subjects in this study were students of 2<sup>nd</sup> Semester Tadris Mathematics Program year 2020. The data of this research was collecting by pre-test and post test. The value data was calculated using Wilcoxon non-parametric statistics by using SPSS. The hypothesis given is alternative hypothesis (Ha): there is a difference in the results of the pre-test and post test, and null hypothesis (Ho): there is no difference in the results of the pre-test and post test. Based on the calculation results obtained, it shows the value of  $asympt.sig. (2-tailed) = 0.000$  with a significance level of 5% (0.05) because the value of 0.000 is smaller than 0.05, so it is concluded that "Ha is accepted". It means that there is a difference between the results of the pre-test and post test, so it can be concluded there is a significant effect of the use online peer teaching with problem based learning on the understanding of materials students as a teacher candidates.

Keywords: peer teaching, problem-based learning, materials understanding

## **INTRODUCTION**

Tadris Mathematics is one of the study programs that prepares prospective mathematics teachers' candidate. Understanding the material is absolutely necessary for student teacher candidates as a provision for understanding the material to teach in schools later. Education for teachers' candidate not only provides an understanding of the subject matter, but also provides teaching and learning strategies. One of the ways of learning for teachers' candidate is by providing practical opportunities to explain material to peers (peer teaching). This provides teaching experience and training for students teacher candidate. Without practice and habituation, teaching skills will not be achieved instantly. The success of the learning process can be seen from the achievement of competence student learning which includes process and learning outcomes (Febriana et al, 2018).

### **Online Peer Teaching**

Peer teaching is a learning model in which students teach each other to their own friends, they are involved in an educational interaction, discussion, convey to their group, answer questions from their group friends. Learning activities are located on students, the role of the lecturer in this case is only as a facilitator / regulates how this condition can take place (Rubiyanto, 2014). According to Hayati & Sitompul (2017) the peer teaching learning model facilitates students with different abilities. Students who have more responsiveness about the material being studied can show concern and responsibility for their friends. So that students can actualize more abilities. A peer tutor (Peer Teaching) is a person or several students appointed by the teacher as a teacher assistant in providing guidance to classmates in order to improve learning outcomes (Arikunto, 2008). By using the peer teaching learning model, students do not need to depend solely on lecturers but can study independently or in groups to exchange ideas with their classmates so that they can improve students' cognitive and affective aspects.

The COVID-19 pandemic has hit the world, forcing almost all countries to make regulations limiting activities outside the home for their entire population. All lectures activities are transferred online through several available virtual meeting communication media such as Google Meet, Zoom Meeting, Microsoft Teams, and others to make physical distance. Learning in the Tadris Mathematics study program at Universitas Islam Negeri Profesor Kiai Haji Saifuddin Zuhri Purwokerto (UIN Saizu) also experienced a change from being offline in the classroom to online. Online or online learning (on the network) is carried out through various applications (Nurgiansyah & Dewantara, 2021). The change in learning methods from classical and face-to-face methods to online methods has received various reactions from students (Kusnayat et al, 2020).

E-learning can be done to find out the factors that contribute to it, the system can evaluate it. According to Asiah (2020) e-learning student learning behaviour, known as online (in the network), attaches great importance to independence for success. Appropriate online learning

strategies are needed so that students do not feel bored and can still understand the material even though learning activities are transferred online. A strategy to make students be active and enthusiastic is combine both peer teaching and problem based learning.

### **Problem Based Learning**

Problem based learning (PBL) learning model or known as problem based learning model is a learning model that uses real problems encountered in the environment as a basis for acquiring knowledge and concepts through critical thinking and problem solving skills. According to Sudarman (2007) states that the foundation of PBL is a collaborative process. Learners will organize knowledge by building reasoning from all the knowledge they have and from all that is obtained as a result of interacting with fellow individuals. With PBL, it is expected that students can solve problems with various alternative solutions, and can identify the causes of existing problems (Fakhriyah, 2014).

The problems posed in PBL are real problems that exist in the field. According to Widayanti & Widodo (2013) problem-solving learning activities are an attempt to develop students' thinking skills. Thinking is a higher - level cognitive activity that involves the assimilation and accommodation of various knowledge and cognitive structures possessed by students to solve a problem. In the problem based learning method, learning focuses on the chosen problem so that students not only learn concepts related to the problem but also the scientific method in solving the problem. The students who can solved its problem, it means that students understand about the materials.

### **The Important about Understanding Materials**

Maskar (2020) states that learning mathematics is also a formation of a mindset that in understanding explains an understanding that exists in reasoning in a relationship between understanding. According to Utami (2020), learning mathematics is not only an orientation towards the end result, but also emphasizes all activities in the ongoing teaching and learning process. So that mathematics education students are not only able to solve problems in mathematics, but also must be able to provide material explanations and interpretations of what they learn during teaching and learning activities. According to Bloom in Utami & Ulfa (2021) states that the notion of understanding includes goals, behaviour, or responses reflecting an understanding of written messages contained in one communication. In other words, the process of student activity and enthusiasm in learning theory indicates that the student is able to capture the learning given by the lecturer, which means that the student's understanding of the material is high.

The importance of understanding the material and the ability to explain or teach is the main asset for student teacher candidates as a provision for teaching in the school. Based on this

description, it is necessary to apply a peer teaching strategy with problem based learning model as an effort to instruct teacher candidate students to understand the material through presentations and teach colleagues, as well as learn to understand the material so that they are able to think critically to solve the problems they face.

## METHODOLOGY

This study is an experimental research with one group pre-test – post test design. Data collection using the pre-test and post test methods. The pre-test was carried out before applying the peer teaching learning model with problem based learning, while the post test was carried out after the implementation of the learning model. The subjects in this study were students of Semester 2 Tadris Mathematics program year 2020. Students were given a pre-test before learning activities. Learning takes place using peer teaching with problem based learning. The first learning step is the presentation of material by students (peer teaching) in some groups with the distribution of material that has been previously agreed upon, then proceed with giving cases/problems. Problems are given related to the material that has been described previously. Students had solved the problems in groups. The results of the problem-solving discussions are presented in front of the class. Other students are allowed to provide feedback on the results of the presentation. At the end of the learning activity, students are given a post test to determine the ability to understand the material. The test after the lessons (post test) was done in order to identify how well students understand the concepts of the lessons (Putra et al, 2018). The hypothesis given is alternative hypothesis ( $H_a$ ) : there is a difference in the results of the pre-test and post test, and null hypothesis ( $H_0$ ): there is no difference in the results of the pre-test and post test. Data processing is calculated using non-parametric Wilcoxon statistical equations with a significance level of 5%, the data calculated using SPSS.

## FINDINGS AND DISCUSSIONS

The research data was obtained from the pre-test and post test scores. The data was then analysed using the normality test to determine the type of statistical test analysis used. Based on the normality test of the data, it was found that the pre-test and post-test data were not normally distributed so that further data analysis used Wilcoxon non-parametric statistical analysis. The results of data processing using SPSS obtained values as in the Table 1.

**Table 1. Pre-test dan Post Test Analysis Data**

		N	Mean Rank	Sum of Ranks
VAR00002 – VAR00001	Negative Ranks	29 <sup>a</sup>	36.00	1044.00

	Positive Ranks	69 <sup>b</sup>	55.17	3807.00
	Ties	7 <sup>c</sup>		
	Total	105		

Based on Table 1, it can be seen that in the negative ranks there are 29 data that have decreased from the pre-test to the post test. The positive ranks value shows that 69 experienced data an increase in the value of the pre-test to the post test. Ties data provide information that there are 7 data that did not experience a decrease or increase in the pre-test and post test scores. Ties data give information that 7 respondents' pre-test score as same as post test score. From the Table 1, the value of mean rank and sum of ranks from negative ranks is smaller than positive ranks. Analysis of the data in Table 1 shows that the data values increased from pre-test to post test score are more than the data that have decreased. From the beginning, it can be show that there is an effect the use of online peer teaching with problem based learning toward the students' ability to understand the materials. The data also calculated by non-parametric Wilcoxon statistical calculation that the result can be shown in Table 2.

**Table 2. Non Parametric Analysis Data**

	VAR00002 - VAR00001
Z	-4.902 <sup>b</sup>
Asymp. Sig. (2-tailed)	.000

Table 2 shows that Z is in negative number, so it can be compared with Z table to make a conclusion for the case. Beside that, the significance value in the calculation of data analysis shows a value of 0.000. Because the value of 0.000 is smaller than 0.05 (significance 5%) it can be concluded that "alternative hypothesis (Ha) is accepted". It because the alternative hypothesis is accepted, so the null hypothesis is rejected. It means that there is a difference between the results of the pre-test and post test, so it can be concluded "There is an effect of the use of peer teaching in online learning on student achievement of teacher candidates."

The use of online peer teaching learning with problem based learning provides a learning experience for students as teacher candidates explaining the material to their peers. Problem based learning as learning model to solve problems critically so that it demands a good understanding of the material from students. Without a good understanding of the material, students will not be able to solve problems well. Therefore, online peer teaching learning with problem based learning is appropriate for students as teacher candidates in addition to providing teaching experience or explaining material, it also provides opportunities for critical thinking by solving problems.

## CONCLUSION

There is an effect of the use of peer teaching with problem based learning in online learning on student achievement of teacher candidates. This treatment give a positive effect to make student as teacher candidates more understand about the learning materials.

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