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## THE ABILITY OF PROBLEM SOLVING STUDENTS GRADES XI THROUGH RESOURCE BASED LEARNING (RBL) ON DERIVATIVE IN MAN MODEL BANDA ACEH

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### Abstract

Implement of derivative often encountered in our daily life problems, but students have trouble to understand about derivative. The ability to understand the material for each student is different. The use of learning resources can help students to understand the material; students should determine which learning resources will be used. Resource Based Learning is an approach in which students choose learning resources. Teacher provides some learning resources such as textbook, video, power point, and informant. The purpose of this study was to determine the ability of problem solving students grades XI through Resource Based Learning on derivative in MAN Model Banda Aceh. Type of this research is pre-experimental design which using one shot case study. The population of this research was all students grades XI in MAN Model Banda Aceh. The sample was student's entire grade XI MIA 4 was selected randomly. Class consist of 30 students. Data were collected through test. Test was conducted to examine the problem solving ability of students. Data were analyzed using t-test statistic that the significant level ( $\alpha$ ) = 0.05 and the degree of freedom (df) = 29. The results showed that the ability of problem solving students grades XI through Resource Based Learning on derivative in MAN Model Banda Aceh is good.

**Keywords:** Problem solving, Resource Based Learning, derivative.

### INTRODUCTION

Mathematics is a subject that students' need to master. Students learn mathematics since elementary school till up to the university levels. Mathematics is used in daily life; it studies the operational procedures that are used in problem solving. Currently we find many students who are less able to solve mathematical problems related to daily life despite that they should be able to apply mathematical concepts to solve problems in daily life. They are only able to solve the routine problems and classroom exercises that can be solved if the procedure or formula is available.

Based on the research that has been conducted by Ramlah, Ikhsan and Turmudi (2013), generally students have difficulty in solving the problem of derivative. They do not understand the concept clearly and correctly. These difficulties resulted in students' problem solving of derivative, so that students are not optimal in learning. Ngilawajan (2013) points out that in solving mathematical problems, some students indicate excellent abilities, while some students indicate ordinary ability, and some students have difficulty.

Thus, Rich (2008) reveals that students should know how to apply the five steps to solve a problem by answering these questions:

- what is the problem?

- what are we doing?
- what are we trying for the first time?
- how do we know that it does or does not work?
- what should we do next?

Accordingly, to solve a problem is an attempt to find a way out of trouble, which means that if something is still surrounded by several obstacles, an effort to achieve the way out does not instantly occur. Steps are needed to achieve it. Consequently, in the classroom, Hill and Hannafin (2001) have found that every student has different ability to understand the material being taught. The learning resources that are used to understand the topic being taught determines the time that students require to understand the concept. These learning resources can be from the media, expert, place, or idea that can support learning. In this case, Suryosubroto (2009) expresses the sources of information that can be used as learning resources besides books, journals, newspapers, multi-media and teachers. Therefore, students can learn in classrooms, laboratories, libraries, and even outside of the school environment.

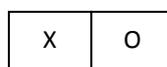
According to Suryosubroto (2009), Resource Based Learning is an approach that is designed to help students determine the exact information sources to be used for learning. According to Nasution (2013), Resource Based Learning is an approach to learning where students both individually or group are immediately confronted with several learning resources and supporting learning activities. Teachers do not present learning materials to students commonly in conventional approach; this is where teachers play the role as a determinant of learning resources (Furtina, Fata & Fitriisa, 2016). However, in the Resource Based Learning approach, students can define their own preferred learning resources.

Resource Based Learning approach is the use and application of available resources to support learning (Hannafin & Hill, 2010) and can be used in teaching and learning activities. Miles (1978) revealed that Resource Based Learning include a selection of active learning, because every student can get a different experience at the same time, and in appropriate with the selected students' learning resources. Based on this opinion, selecting learning resources to be used is to have students get different experiences. This approach can be directed by the teacher and student-centered activities, can involve various disciplines either individually or in groups, and can use audio-visual tools to observe individuals or the entire class (Suryosubroto, 2009).

Based on the description above, it can be concluded that the Resource Based Learning is an approach that allows students to choose their own learning resources to understand the material. Teachers guide the students during the learning process. Through this approach, students' skills in problem solving can improve.

## **METHOD**

This study is a quantitative research, because it is to see the ability of students in solving problems by using the pre-experimental design with a one-shot case study which is described as the following diagram.



Information:

X = experience treatment

O = test score of the experimental group

The research population was all students grades XI in MAN Model Banda Aceh. The research samples were students' grade XI MIA 4 selected randomly, and the class consists of 30 students. In this research, the first author acted as a teacher. The students were asked to join in groups, with each group consisting of 4-5 students, and also each group having at least one laptop. The researchers gave all of the learning resources that had been prepared and worksheets. Students chose the most preferred learning resources to understand the subject matter and to solve the problems on worksheets. Learning resources that used in this study were: human/resource,

textbooks, and audiovisual. The research was conducted over four sessions. Three sessions were designed for teaching mathematics material and one session was for the test.

The data were derived from the final test (post-test). The post test results were analyzed by using t-test (Sundayana, 2012, p. 96). Before using the t-test, the data was tested for normality of data, which is a requirement to t-test, by using the formula  $\chi^2$  (Sundayana, 2012, p. 84). Then the test result data was analyzed with the following hypotheses:

**H<sub>0</sub> :**  $\mu_1 \leq \mu_0$ ; The ability of problem solving students grades XI through Resource Based Learning on derivative in MAN Model Banda Aceh is not good.

**H<sub>1</sub> :**  $\mu_1 > \mu_0$ ; The ability of problem solving students grades XI through Resource Based Learning on derivative in MAN Model Banda Aceh is good.

The criteria for statistical hypothesis testing are: reject H<sub>0</sub> if  $t > t_{tabel}$  with significance level  $\alpha = 0.05$  and  $df = n - 1$ .

## RESULTS AND DISCUSSION

In this research, at each session there are four learning resources. In the first session, the teacher explained how to learn with the Resource Based Learning (RBL). Students were asked to sit in groups. In the second and third sessions, students were getting used to learning with RBL and they have previously been given the learning resources that should be used. Learning resources used in this study include:

- People/informant; informant of the learning resources is the researchers.
- Textbook; textbook that belong to all students.
- Audiovisual; audiovisual used in the form of learning video, where there are four videos provided according to sub discussion used in this research.

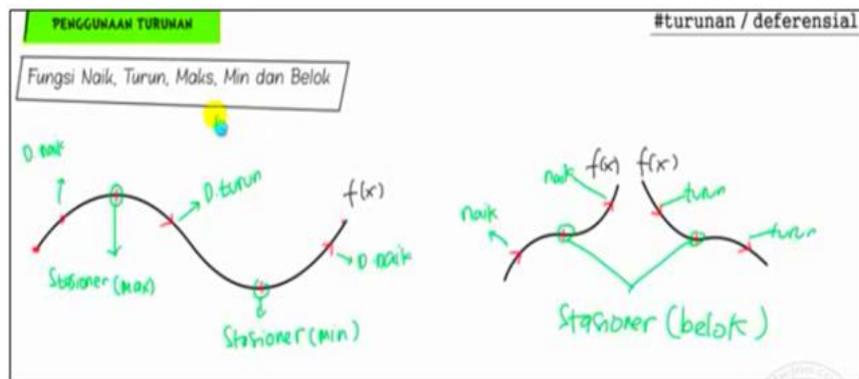


Figure1. Learning videos of ride function and descend function.

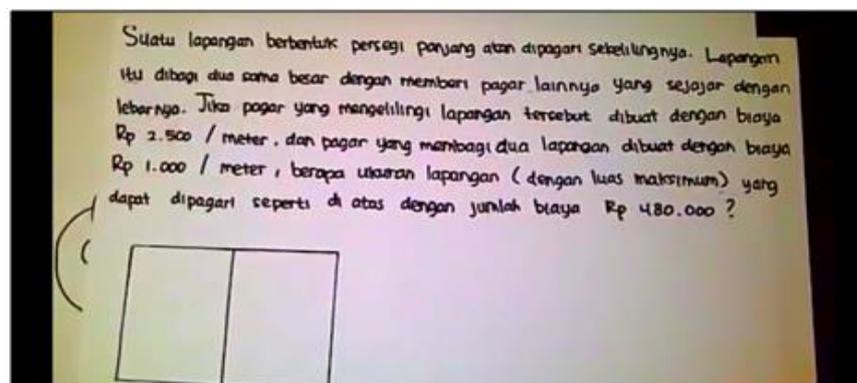


Figure 2. Learning videos of maximum and minimum problems.

Slide PowerPoint; PowerPoint display with animation as shown below.

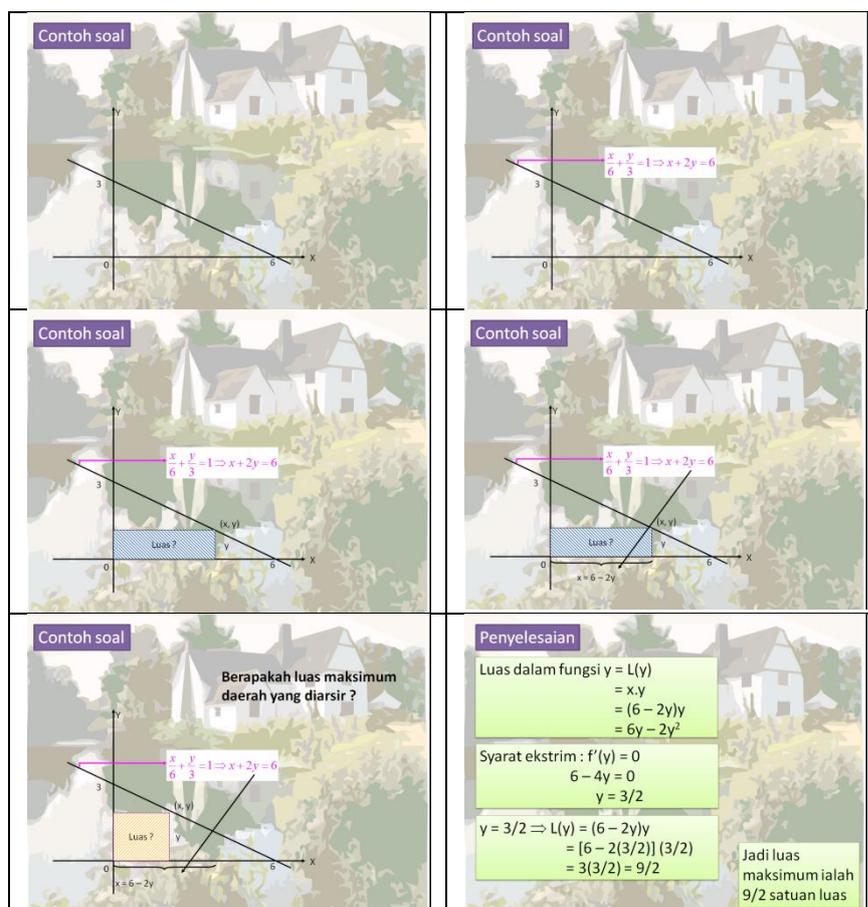


Figure 3. Stages of animated PowerPoint for maximum and minimum problems.

Test of normality conclude that the data was of normal distribution. So the t-test obtained was  $t_{test} = 4,19$ . For a significant level  $\alpha = 0.05$  and  $df = n - 1 = 30 - 1 = 29$ . We get  $t_{0,95}(29) = 1.70$ . while  $t_{test} > t_{table}$ . This means that the null hypothesis is rejected and the alternative hypothesis is accepted.

Based on the data collected and t-test result, we know that the ability of problem solving of the students is good. This is because in Resource Based Learning approach students get a variety of examples that motivate them to understand the lessons and they can find new ideas that are helpful in solving the given problem.

The results of this research supports the research by Aliyah, *et al.* (2013, p. 14) that also found Resource Based Learning as an effective approach to improve the ability of problem solving by the students. It is also in line with the results of the research by Melendres (2015, p. 7), who reveals that the Resource Based Learning helped developed various information of literacy skills such as helping, listening, persuading, questioning, sharing, and respecting. This approach supported the constructivist theory and it enabled students to be active learners as they use a wide range of materials to deal with a subject matter. It also served well as a component of teacher-directed instruction.

## CONCLUSION

The ability of problem solving students grades XI through Resource Based Learning on derivative in MAN Model Banda Aceh is good. It is suggested for future researchers to further investigate on the most effective learning resources in order to avoid student's confusion in learning.

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