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Confidence, Flexibility and Student's Appreciation in Solving Mathematic Problems through Resource-Based Learning

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***Abstract*—This study is a quantitative descriptive research that aims to determine the ability of self-confidence, flexibility, and appreciation of students in solving math problems through Resource-Based Learning. A saturated sampling technique was used to assign a sample of 115 students. The data used are PAM test, observation sheet, and questionnaire. The PAM test is used to divide the sample into three groups: high, medium, and low grade. Based on the results of data processing, the stages of searching and collecting information from various sources to answer math problems in Resource-Based Learning is a stage that can develop the ability of flexibility, confidence, and appreciation of students. High class has a great sense of trust compared to other classes. Medium to low grade flexibility is better than high class. While the appreciation of the class is better than the high and low class. Resource-based learning enables students to gain learning information from sources other than teachers.**

Keywords—present; identify; informing; plan; provide; gather information; organizing presentation; evaluate

I. INTRODUCTION

Mathematics is one of the lessons that exist in every level of school. Math Lesson is one of the lessons that are considered difficult, boring and scary by students [1][2]. As a result, student achievement in Mathematics is less good. If a student successfully learns math well then it can be expected he will succeed on other lessons [3]. Mathematics achievement will increase if students have a positive attitude towards Math [4]. . One positive attitude is appreciation [appreciation]. Appreciation The mathematics and usefulness of Mathematics in life is very important [5]. If students already have a high appreciation of Math then it will grow self-confidence and flexibility of students [6]. self-confidence is one aspect that can make student achievement increase in learning mathematics [7].

Therefore, it takes a learning method that can enable students in the learning process to improve positive attitudes and achievements. One of the learning methods that enable students is the method of Resources-based learning [RBL]. RBL method is a learning method that uses various types of resources in learning [8]. Rowntree says that students need other learning resources other than those given by the teacher. Students want to choose media or learning resources that match their learning style [9]. RBL can make students learn more freely, broadly, and increase the ability. If students learn by using technology then students must have expertise in technology and can manage the effectiveness of the time they need [9]. In RBL the teacher must have competence in pedagogy, evaluation, and feedback that will be implemented. While students learn to use various learning resources to solve the problem [8]. Because every student has its their own talent and learning style [10].

Based on this, the research on how the appreciation, confidence and flexibility of students using Resources-based learning is important to be able to develop students' cognition and student preferences of Mathematics.

II. RESULTS AND DISCUSSIONS

This study used quantitative descriptive research with a sample size of 115 junior high school students. Based on the initial mathematical knowledge test, the sample is divided into three groups of abilities there is high-class, middle-class, and low-class groups. The high-class group consisted of 29 students, 61 class students, and low-grade group of 25 students.

The instruments used were Likert's scale questionnaires and observation sheets. Questionnaires were used to obtain data on students' appreciation, confidence, and flexibility that contained 17 points of statement. Observation sheets are used to view teacher and student activities in Mathematics learning with Resource-Based Learning.

The meeting in this study was conducted three times and one questionnaire. The steps of learning process of mathematics with Resource-Based Learning Method are as follows:

A. Introduction

Teachers provide apperception and motivation in learning.

B. Implementation of Learning

- The teacher presents a problem [present the question or problem] that will be solved by using various learning resources.

- Students identify the purpose of the problem [identify the information questions or problem]. One of the most important steps taken by students in Resource-Based Learning is to involve students in understanding the purpose of the problems posed by teachers.
- Teachers inform learning resources that students can use to answer questions or problems [informing resource to answer a given problem or issue learning]. After students understand the intent of a question or problem then the student can identify the necessary information and determine how to obtain it. Here the teacher can help the students by telling them that the information can be obtained from learning resources, such as print media, non-print media, expert / human, and others [informing to answer a given problem].
- Students plan the information to be searched from various sources of study to solve the problem [plan the search for information].
- The teacher asks the students to record the results of the information gathered to be obtained in the worksheet [provide a way for student to record their information].
- Students searching information from various sources of learning [search the information from the resource].
- Students collect information obtained from various sources of learning [gather information].
- Students find information specific and related to the problems posed by the teacher [finding needed information].
- Students use the information to solve the problems posed by the teacher [use information].
- Students organize the information they get to solve the problem [organizing the information].
- Students present the information they have analyzed and the work they have done [presentation information].
- Teachers evaluate students' work [evaluate]

C. Closing

Teachers and students reflect on the learning that has been done and make conclusions together.

Description of teacher activity in learning Mathematics with Resource-Based Learning can be seen in table 1.

TABLE I. THE PERCENTAGE OF TEACHER'S ACTIVITY THROUGH RESOURCE-BASED LEARNING.

Class	1st		2nd		3rd	
	Percentage	Criteria	Percentage	Criteria	Percentage	Criteria
High	70 %	Enough	90 %	Good	90 %	Good
Middle	80 %	Enough	90 %	Good	100 %	Good
Low	80 %	Enough	100 %	Good	100 %	Good
Average	76,7%	Enough	93,3 %	Good	96,7 %	Good

Teacher activity in learning with Resource-Based Learning increases every meeting. At the first meeting, the teacher still adapts to the students. So that less math learning less. A description of student activity during research with Resource-Based Learning can be seen in table 2.

TABLE II. THE PERCENTAGE OF STUDENT'S ACTIVITY THROUGH RESOURCE-BASED LEARNING.

Class	1st		2nd		3rd	
	Criteria	Percentage	Percentage	Criteria	Percentage	Criteria
High	75%	Enough	87,5%	Good	100%	Good
Middle	87,5%	Good	100%	Good	87,5%	Good
Low	75%	Enough	87,5%	Good	100%	Good
Average	79,2%	Enough	91,7%	Good	95,8%	Good

The percentage of student activities in the Resource-Based Learning Method has increased in each meeting. At the first meeting, students are still adjusting in Mathematics learning using Resource-Based Learning method. At the second and third meetings students are getting used to using other learning resources other than teachers. Learning resources used include books [which students have or from the library], computer [internet usage and math applications], and other multimedia. Some of the media that students use in RBL is presented in the following pictures. Fig 1 shows students learning to use the book source. The book used is a textbook of Mathematics or a book related to problem solving provided by the teacher.

Fig. 1. Student learn from the book

In Fig 2, students are learning by using computer and internet learning resources. Computer and internet are used by students to find solutions to problems the teacher provides.

Fig. 2. Student learn using computer and internet

In Fig. 3, students learn by using other multimedia such as power point, learning video, and mathematical applications such as Geogebra. Students have expressed that multimedia has made an opportunity for them to learn easily and in a fun or enjoying way [12]. And Multimedia in mathematics learning is more efficient [13].

Fig. 3. Student learn using the multimedia

In picture 4, the power point used by the teacher when explaining the material of cubes and beams. From this power point, students learn about the definitions and elements contained in cubes and beams. Visual media or power point can increase of student achievement [14].

Fig. 4. Power Point used by the teacher

In Fig 5, students learn to present results from searches they have obtained from various sources. This is done to improve students' self-confidence once they have gone to great lengths to search and use various sources. Because Mathematical values was reflected in a mathematical activity [15].

Fig. 5. Student Learn To Present The Results Obtained

The results of the questionnaire on students' self-confidence for high, medium and low classes in Resource-Based Learning method can be seen in table 3.

TABLE III. THE SELF-CONFIDENCE OF STUDENT'S THROUGH RESOURCE-BASED LEARNING.

No	Statement	Score		
		High	Middle	Low
1	Students have confidence that students are capable of doing mathematical tasks	3,3	3,1	3,4
2	Students are afraid / shy when the teacher asks students to do math problems to the front of the class.	2,7	2,6	2,6
3	Students doubt that any math problems can be done	2,7	2,6	3,0
4	When students face difficulties in working on math problems, students see the work of friends	2,9	2,6	2,8
5	If students have difficulty asking students to the teacher	3,7	2,8	2,7
6	Students are not ashamed to refute the opinions of classmates	3,1	2,8	2,9
7	Students only become class listener	3,0	2,8	3,0
8	Students are not afraid to answer wrong questions given by the teacher	2,8	3,0	2,9
9	Students do not hesitate to express opinions either in groups or in class	3,1	3,2	3,1
	Average	**3,03**	**2,83**	**2,93**

Table 3 shows that students' confidence in each class has an above average neutral score of 2.5. This shows that students have confidence in solving math problems. The attitude of confidence of high grade students with high ability has the highest average compared with other classes. This shows that high-ability classes have more trust than middle and low class. However, in the no. 8 statement, high-grade students tend to be afraid of wrongly answering questions given by teachers compared to the middle and lower classes. This is because; if the answer is wrong then students feel embarrassed and do not want to answer other questions.

The result of questionnaire about students' flexibility in Resource-Based Learning method can be seen in table 4.

TABLE IV. THE STUDENT'S FLEXIBILITY THROUGH RESOURCE-BASED LEARNING.

No	Statement	Score		
		High	High	High
1	Students love to solve math problems from various sources	3,0	3,2	3,2
2	There is only one to solve math problems	2,7	3,0	3,2
3	For a deeper understanding, students try to solve math problems in other ways	2,9	3,1	3,0
4	Students love to solve math problems in different ways	3,1	3,1	3,0
	Average	**2,93**	**3,1**	**3,1**

High class has a low degree of flexibility compared to other classes. This suggests that high-grade students still believe in the solution provided by the teacher for a deeper understanding. So, they are less flexible in solving math problems.

The result of questionnaire about students' appreciation attitude in Resource-Based Learning method can be seen in table 5.

TABLE V. THE STUDENT'S APPRECIATION THROUGH RESOURCE-BASED LEARNING.

No	Statement	Score		
		High	Middle	Low
1	Students become more careful in calculations by learning math	3,2	3,7	3,0
2	Students become faster in calculations by learning math	3,7	3,6	3,0
3	Students can express the statement briefly and clearly by learning math	3,0	3,6	3,1
4	Students more easily understand a statement by learning math	3,4	3,6	3,2
	Average	**3,33**	**3,63**	**3,08**

The students' appreciation of the role of mathematics in culture and values as well as mathematics as a tool or as a language has a positive attitude. Students can quickly and meticulously perform their calculations by learning math. So that students more easily understand a statement. If students are able to understand the statement well then, the students will be easier in solving a problem. Table 5 shows that middle students have a higher appreciation than other classes. Because by using Resource-Based Learning, students can better know the role of mathematics in everyday life. Mathematics study does not only stay in the classroom, but also return to daily life [11].

Based on the results of our research, students have confidence, flexibility and positive appreciation with Resource-Based Learning. This indicates that students are starting to like math lessons. At the first meeting, students still can't make conclusions at the end of the lesson and have not dared to present answers to mathematical problems. Some students at this meeting still did not pay attention to the teacher's explanation and were not serious about doing the tasks of the teacher. Second meeting, some students still do not pay attention to teacher explanation and not serious in doing task from teacher. However, students prefer to ask questions directly when the teacher goes around the classroom or asks his / her cohort to make a conclusion at the end of the lesson. Some students at this meeting still did not pay attention to the teacher's explanation and were not serious about doing the tasks of the teacher. At the third meeting both in high, medium, and low grade all the student activity indicators performed well although there were some shortcomings such as the students could only do a few questions because the time given was less. Some students have dared to search information with the various sources of learning they get but still considered less because only certain students seek and collect information while other students still have not done so.

In general, students are happy to learn mathematics materialized through attitudes and actions in choosing an approach to accomplish the task. The findings indicate that with the Resource-Based Learning method, students are skilled in obtaining information resources by utilizing source diversity. This is in line with Suryosubroto's opinion that Resource-Based Learning is an approach designed to facilitate students in overcoming the students' skills about the breadth and diversity of information resources utilized for learning [16].

III. CONCLUSION

Good confidence, high flexibility, and good appreciation in learning Mathematics will encourage students to develop mathematical cognitions and student preferences for Mathematics. Such attitudes will encourage good achievement in Mathematics lessons or in solving problems.

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