THE EFFECTIVENESS OF USING THE DRILL METHOD ON THE LEARNING RESULTS OF CLASS XI STUDENTS EVEN SEMESTER OF SMK

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ABSTRACT

Educational success is influenced by teachers, students, and teaching methods. However, the process of learning mathematics is still teacher-centered, so it has a less significant impact. This result of student's mathematics learning outcomes is still low. This research aimed to know the effectiveness of using the drill method on students the result of learning in XI grade, even semester of State Vocational High School (SMK N) 1 Pajangan Bantul Regency academic year 2017/2018. This type of research is experimental research. The population in this research is class XI students of SMK N 1 Pajangan. Sampling was taken by random sampling technique, class XI Software engineering (RPL) C as an Experiment class, class XI RPL-A as a control class, and class XI RPL B as a trial class. Test instruments used validity test with product-moment correlation formula, reliability with Alpha formula. Data analysis with a hypothesis test, normality test with Chi-Square formula, homogeneity test by Bartlet test. The research results found that the drill method was more effective than the conventional method on students learning outcomes on XI grade, even the SMK N 1 Pajangan Bantul Regency academic year 2017/2018. This can be seen from the second hypothesis's calculation with a significant 5% level and the degree of freedom 44, obtained $t_{count} = 7{,}605$ dan $t_{table} = 2{,}0154$, then $t_{count} > t_{table}$.

Keywords: effectiveness, drill method, learning outcomes.

INTRODUCTION

The progress of a nation is influenced by one factor, namely, education. According to Law Number 20 the Year 2003 concerning National Education System Article 1, education is a conscious and planned effort to create an atmosphere of learning and learning process so that students actively develop their potential to have noble spiritual strength, as well as the skills needed by themselves, the community, nation, and state. Redja Mudyaharjo (2014: 11) argues education is a conscious effort undertaken by families, communities, and government through mentoring, teaching, or training activities that take place in school and outside of school for life, to prepare students to play a role in sharing the right environment in the future. Education plays a vital role in life to create and shape the younger generation to become the next generation that is strong, advanced, skilled, and educated. Education, both formal and non-formal, is a government program to meet skilled and efficient human resources. Various attempts have been made to improve students' success in education, significantly improving mathematics education quality. These efforts include curriculum improvement, improved teaching materials, optimization of teaching and learning processes, procurement of new books, and mathematical teaching aids. In these changes, education is demanded to make a real contribution, namely to improve the quality of educational outcomes and services to the community. The education world must also carry out innovations or updates in various fields, including the implementation strategy. Therefore, education is an exciting problem to continue to be studied and developed.

The success of mathematics learning is primarily determined by two principals, namely the teacher and students. According to Slameto (2015: 2), learning is a business process carried out by a person to obtain a new change in behavior as a whole, as a result of his own experience in interactions with his environment. In the whole process of education in schools, learning activities are the most basic activities. This means that the success or failure of achieving education goals depends on how students experience the learning process as students. Mathematics is one of the subjects in schools that get the

most significant attention both among educators and children. Not a few parents who have the perception that mathematics is the most important knowledge that children must master. Many students find mathematics a less pleasant subject. This must be a reflection of learning. Based on the results of interviews on March 9, 2018, with teachers in mathematics studies, the low learning outcomes are due to the large number of students who play around when learning begins, or there are still many students who do other activities while learning takes place. In learning mathematics so far, problems arise because students do not understand the material presented. This is influenced by the learning that has been taking place so far, which is still teacher-centered, and the lack of variation in learning, so students are bored and lack interacting to get their knowledge.

When learning in the classroom takes place, the lack of exercises that are given. As for the assignments, the teacher only asks students to work on the questions on the Student Activity Sheet obtained from the Electronic School Book (ESB). According to the results of interviews with the students concerned, students have difficulty understanding the teacher's material because the teacher is in the teaching and learning process, which has so far only used conventional methods. When using conventional methods, students feel bored and less motivated to follow the subjects. This can hamper the teaching and learning process's success, which results in student learning outcomes not being achieved optimally. Based on the data the researchers got from the teacher's Daily Test scores, obtained student learning outcomes are still low. At SMK N 1, the Minimum Completion Criteria (MCC) value is 70. A summary of the results of the Daily Test scores that have been made can be seen from Table 1.

Table 1. Average Daily Test scores for Mathematics Subjects in Class XI

Class	Total student grades < MCC 75	Total student grades ≥ MCC 75
XI RPL-A	12 student	9 student
XI RPL-B	10 student	12 student
XI RPL-C	13 student	10 student

Seeing the problems above, the drill method is considered relevant in order to minimize the problem. Because the drill method can develop intellectual skills such as counting, multiplying, adding up, and other exact sciences. This study aims to determine the effectiveness of using the drill method on student learning outcomes in class XI, even the SMK N 1 Pajangan Bantul Regency in 2017/2018.

METHODS

This type of research is experimental research. The design in this study was carried out in two classes, namely the experimental and control classes. The design in this study was Posttest-Only Control Design.

Table 2. Posttest-Only Control Design Research Design

Class	Treatment	Posttest
A	X	O_2
B		O_4

(Sugiyono, 2016:116)

Information :

A: Class selected as an experimental class

B: Class selected as control class

X: Treatment using the drill method

O_2: Experiment class posttest results

O_4: Control class posttest results

This research was conducted at SMK N 1 Pajangan class XI RPL Bantul Regency Academic Year 2017/2018. When the research for data collection was carried out on April 18 to June 9, 2018, in this study, sampling was carried out by using random sampling techniques to the class. The sampling class is done by lottery to determine the experimental class and the control class. After drawing the population consisting of three classes, it was found that class XI RPL- C with 23 students as the

experimental class, class XI RPL-A with 23 students as the control class, and class RPL B with 22 students as the pilot class. In this study, there are two types of variables. The two variables are the drill method and mathematics learning outcomes. In this study, data collection techniques in interviews (interviews), observation, and tests. The instrument test uses the validity test with the product-moment correlation formula; the reliability uses the Alpha formula and the distinguishing power. Data analysis with hypothesis testing, normality test with Chi-Square formula, homogeneity test with Barlet Test.

RESULTS AND DISCUSSION

The initial ability score was obtained from the results of daily tests in class XI of SMK N 1 Pajangan 2017/2018 school year. The summary description of the initial mathematical ability values can be seen in Table 3.

Table 3. Data Description of Initial Ability Values (Daily Tests)

Variable	XI RPL-C	XI RPL-A	XI RPL-B
Total students	23	23	22
The highest score	81	78	80
Lowest Value	64	50	55
Average	72,04	68,73	67,14
Standard Deviation	5,22	7,09	7,10
Variance	28,05	50,27	50,43

A normality test is a prerequisite before testing the hypothesis. A normality test is used to test whether the data used is normally distributed or not. To do the normality test, the Chi-Square formula is used. A summary of the normality of the experimental class calculation is presented in Table 4.

Table 4. Normality Test Results Initial Capability Values

Class	χ^2_{count}	χ^2_{table}	Significant level	df (k-1)	Information
Experiment	4,934	11,07	5%	5	Normal
Control	0,913	9,488	5%	4	Normal
Testing	2,469	11,07	5%	5	Normal

The sample criteria are standard if $\chi^2_{count} < \chi^2_{table}$. Based on the calculation of the normality test in table 4 above, it can be seen that the experimental class $\chi^2_{count} = 4.934 < \chi^2_{table} = 11.07$ with a significant level of 5% and degree of freedom 5, so that the initial ability data of the experimental class is normally distributed data. The control class $\chi^2_{count} = 0.913 < \chi^2_{table} = 9.488$ with a significance level of 5% and degrees of freedom 4, the control class's initial ability data is normally distributed. The trial $\chi^2_{count} = 2.469 < \chi^2_{table} = 11.07$ with a significant 5% level and degrees of freedom 5, so the initial ability control data is normal distribution data.

A homogeneity test is done to determine whether the two experimental classes have the same or homogeneous mastery, or have the same variance. The following are homogeneity test data based on the calculations performed. A summary of the results of homogeneity test calculations can be seen in Table 5.

Table 5. Preliminary Homogeneity Test Results

χ^2_{count}	χ^2_{table}	Significant level	df (k-1)	Information
2,312	5,995	5%	2	Homogenous

From the table above, it can be seen that $\chi^2_{\text{count}} < \chi^2_{\text{table}}$so that H_0 is accepted; this shows that all three classes have the same initial ability.

A validity test is used to get data (measure) that data is valid. The summary of the results of the initial ability validity test results can be seen in Table 6.

Table 6. Test Results of Trial Class Validity

Item Question	r_{count}	r_{table}	Criteria
1	2,2441	1,725	Valid
2	2,1192	1,725	Valid
3	2,8946	1,725	Valid
4	2,9517	1,725	Valid
5	3,4017	1,725	Valid
6	2,6715	1,725	Valid
7	2,5481	1,725	Valid

From the table, it can be concluded that all items in the test problem are valid because the value of the $r_{count} < r_{table}$ is 1.725.

Reliability tests are used to obtain instruments that will produce the same data to measure the same object. The summary of the reliability test results can be seen in Table 7.

Table 7. Reliability Results of Trial Classes

Class	r_{11}	r_{table}	Information
XI RPL B	1,974	1,725	Reliable

From the above table, it can be concluded that the test problem is reliable because the value of $r_{11} < r_{table}$ is 1.725.

The distinguishing power is used to find out a good or wrong item. The summary of the results of the initial ability validity test results can be seen in Table 8.

Table 8. Distinguishing Power of Test Problems

Item Question	Distinguishing Power	Criteria
1	0,58	Good
2	0,58	Good
3	0,75	Very Good
4	0,67	Good
5	0,50	Good
6	1,17	Very Good
7	0,42	Good

From the above table, it can be concluded that the distinguishing power of the seven items used exceeds the value of 0.30 so that the distinguishing power of item number 1,2,4,5,7 is good, and the distinguishing power of item 3,6 is very good.

A normality test is done to ensure that the learning outcomes of each class are normally distributed. The normality test process is done manually. Based on the calculation of each class shows that the two classes are typically distributed. Table 9 below summarizes the results of the normality of learning creativity using the Chi-Square formula.

Table 9. Summary of the Results of the Normality of Learning Outcomes

Parameter	Experiment Class (Drill Method)	Control Class (conventional method)
χ^2_{count}	3,704	$-4,453$
χ^2_{table}	11,07	11,07
Significant Level	5%	5%
dk(k-1)	5	5
Testing criteria	Samples are normally distributed if $\chi^2_{count} < \chi^2_{table}$	
Information	Normal	Normal

Test criteria for normality test if $\chi^2_{count} < \chi^2_{table}$, then the data is usually distributed. From the table, it can be seen that $\chi^2_{count} < \chi^2_{table}$ in both classes, then the population is normally distributed.

A homogeneity test is done to determine whether the two experimental classes have the same or homogeneous mastery, or have the same variance. The following are homogeneity test data based on the calculations performed. A summary of the results of the homogeneity test calculation can be seen in Table 10.

Table 10. Summary of Homogeneity Test Results Learning Outcomes Value

χ^2_{count}	χ^2_{table}	Significant Level	df (k-1)	Information
1,249	2,05	5%	22	Homogeneous

From the table above, it can be seen that the $\chi^2_{count} < \chi^2_{table}$ so that H_0 is accepted. This shows that the learning ability of both classes has the same or homogeneous variance.

a) First Hypothesis Test

The null hypothesis (H_0) and its counterpart (H_1) submitted for the first hypothesis test are as follows:

H_o: There is no difference in the mathematics learning outcomes of students taught using the drill method with students who are taught using conventional methods of class XI Even Semester SMK N 1 Display.

H_1: There are differences in mathematics learning outcomes of students taught using the drill method, and students taught using conventional methods in class XI Even Semester SMK N 1 Display. The summary of learning outcomes can be seen in table 11.

Table 11. Summary of the First Hypothesis Learning Outcomes

t_{count}	t_{table}	Significant Level	df	Information
7,605	2,0154	5%	44	H_1 accepted

By looking at the distribution t-table at a significant level of 5% and df = 44, obtained $t_{table} = 2.0154 < \boldsymbol{t_{count}} = 7.605$ then H_1 is accepted H_0 is rejected, which means that there are differences in learning outcomes of students taught using the drill method with students taught using the method conventional class XI Even Semester SMK N 1 Display.

b) Second Hypothesis Test

The null hypothesis (H0) and its counterpart (H1) submitted for the second hypothesis test are as follows:

H_o: The drilling method is not effective than conventional methods; on the learning outcomes of mathematics class XI Even Semester SMK N 1 Display.

H_1: The drilling method is more effective than the conventional method of learning outcomes in mathematics in class XI Even Semester SMK N 1 Display.

Table 12. Summary of Second Hypothesis Learning Outcomes

t_{count}	t_{table}	Significant Level	df	Information
7,605	2,0154	5%	44	H_1 accepted

By looking at the distribution t-table at a significant level of 5% and df = 44, obtained $t_{count} = 7.605 > \boldsymbol{t_{table}} = 2.0154$ then H_0 is rejected H_1 accepted, which means that the Drill Method is more effective than the conventional method of mathematics learning outcomes in class XI Even Semester SMK N 1 Display of 2017/2018 Academic Year.

The above description illustrates that the drill method in mathematics learning is proven to improve student mathematics learning outcomes. Using the drill method is more effective than using conventional methods on student learning outcomes and helps teachers create varied learning activities. Students get more opportunities and are accustomed to working on the problems every day so that when

the experimental class students are given posttest questions, they do not feel difficulties. Experimental class students are already accustomed to working on similar questions before both the questions that come from textbooks and LAS. Thus students become easier to understand the material and understand the steps in solving problems so that the time spent is more efficient. Unlike the control class, students are taught using conventional methods; they are more passive in the learning process. During group discussions, some do it seriously but some only copy the work of friends.

On the other hand, the control class posttest was conducted in the last hours of learning so that students were no longer excited, and many complained. In learning mathematics on transformation, practice is needed to train students to calculate and use formulas. In this material, students are required not only to understand the concept but to practice working on the problems. This has resulted in learning outcomes in class XI students of SMK N 1 Display using the drill method better than conventional methods.

CONCLUSION

Based on the results of the research and discussion as listed above, it can be concluded that there are differences in mathematics learning outcomes of students who are taught using the drill method with students who are taught using conventional learning strategies in class XI students of SMK N 1 Display Year 2017/2018. Based on the first hypothesis test results with a significant level of 5% and degrees of freedom 44, this is shown based on the obtained value of $t_{count} = 7{,}605 > t_{table} = 2{,}0154$. Besides, the drill method is more effective used in learning compared to conventional learning strategies on mathematics learning outcomes of students of class XI Vocational High School 1 Pajangan 2017/2018 Academic year. This is shown based on the second hypothesis test results with a significant level of 5% and degrees of freedom 44, obtained $t_{count} = 7{,}605 > t_{table} = 2{,}0154$.

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