



Efforts to Increase Students' Motivation and Ability in Installing Operating Systems Using the Discovery Learning Model for Class X-TKI Students at SMK Negeri 2 Bandung

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ABSTRACT

This research aims to determine the increase in student learning motivation and students' ability to install operating systems after implementing a scientific approach with a discovery learning model in Productive Computer Engineering and Informatics subjects in Class X-TKI Students at SMK NEGERI 2 BANDUNG. In carrying out actions in each cycle, we engineer a problem by setting the computer so that it cannot be used because the operating system is damaged. Students are asked to make repairs by reinstalling the operating system. The instruments used were test sheets and observations. The data analysis used was qualitative descriptive analysis. The data analyzed are written and practical test scores on the basic competency "Installing Operating Systems". Applying learning through the discovery method using a scientific approach can increase students' motivation and ability to install operating systems. The results of this research can be used as information for teachers in increasing students' motivation and ability to learn.

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1. INTRODUCTION

In accordance with Minister of Education and Culture Regulation no. 81A of 2013 that in the 2013 Curriculum the learning process uses a scientific approach with project-based learning methods, problem-based learning and discovery learning (Amini *et al.*, 2019). In the productive learning process of the TKI skills program, especially the Basic Computer and Network subjects in class Several factors that cause saturation are when installing the operating system, the time required for the operating system kernel to detect computer hardware components, waiting for the loading process, until the completion of the installation process which tends to be long. and several installation processes that seem conventional and less challenging, where students are only faced with several alternative problem solutions, such as pressing the next, back, or cancel buttons.

This then influences student motivation and behavior in operating system installation practicum activities (Johari & Bradshaw, 2008). Based on observations in the practicum room, they fill their time with various activities that have nothing to do with learning, such as communicating with group friends, doing assignments in other subjects, and several other activities that are not linear with the Basic Computer and Network subjects. Sometimes teachers have to reprimand students because their activities in class interfere with the learning process. In fact, what is most worrying is that students' motivation to take part in learning the Operating System Installation competency is reduced, thereby affecting students' final grades.

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Based on these findings and characteristics, the alternative solution is to actively involve students in implementing learning methods which are expected to overcome the low learning motivation of Computer Engineering and Informatics students in class X TKI students through discovery methods using a scientific approach. This learning method was chosen so that students are used to looking for, looking for, discussing something related to teaching. (Korthagen, 2004). In the discovery learning method, students are more active in solving problems, while the teacher acts as a guide or provides instructions on how to solve the problem (Simamora & Saragih, 2019).

This classroom action research aims to determine the increase in student learning motivation and students' ability to install operating systems with the Discovery Learning model in Basic Computer and Network subjects for Class X TKI students at SMK Negeri 2 Bandung for the 2020/2021 academic year.

2. METHODS

2.1. Research Setting

We choose a learning model that is considered appropriate to the material to be delivered. In this case, the researcher chose the Discovery learning method with a scientific approach, which then created learning units, lesson plans and learning tools.

2.2. Research Preparation

In carrying out actions in each cycle, the author creates engineering problems by setting the computer so that it cannot be used because the operating system is damaged. Students are asked to make repairs by reinstalling the operating system until the computer can function normally again.

2.3. Engineering Issues

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2.4. Research Instruments

2.4.1. Test sheet

In this research, the posttest was used to determine the extent of learning completeness that can be achieved using the contextual teaching and learning (CTL) learning model. Based on the 2006 Vocational School GBPP: students have completed their studies if they have obtained a score of 65% (score 65) or in accordance with the specified KKM. Complete in this case is that students have successfully studied the material on Operation of Word Processing Software.

2.4.2. Observation sheet

The observation sheets used are learning management observation sheets by fellow teachers and observations of student activities in class carried out by the author, whether these learning activities make students motivated and interested.

2.5. Research design

Research Design The series of procedures and methods used to analyze and collect data to determine the variables that will be the research topic can be seen in **Figure 1**.

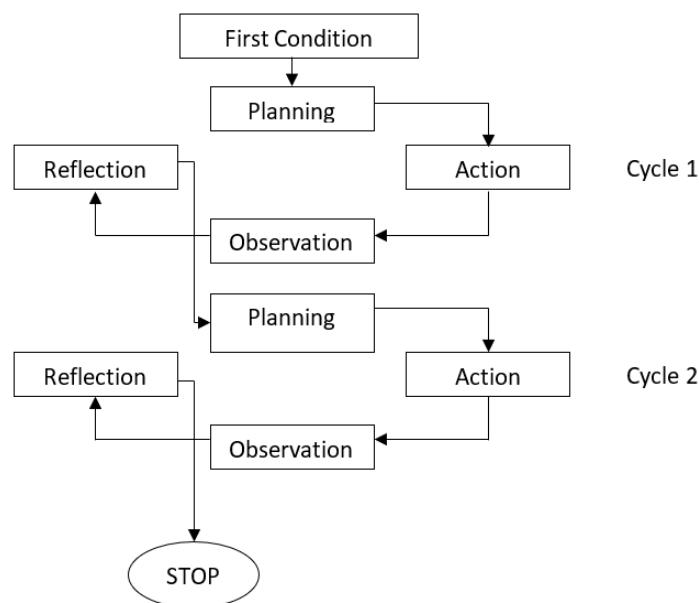


Figure 1. Schematic diagram of the physicochemical treatment process in the station of the textile industrial unit.

3. RESULTS AND DISCUSSION

3.1. Research Overview

This research was carried out over 2 cycles, starting in the 2nd week of September until the 2nd week of October 2020. Students or subjects of action in the X-TKI class. The level of attendance (attendance) of students during learning, especially during the implementation of actions, is very good. Based on data from the student attendance register book, the average student attendance during the 2 cycles was 98%.

3.1.1. Cycle 1

The first meeting was held on September 15 2020, Tuesday during classes 1 and 4. Learning steps start from Pre-Activities; namely the teacher enters the class and says hello after that together with the students recite a prayer, the teacher skips the students' attendance. After that the teacher explains the learning objectives and learning techniques. The basic competency is installing operating systems. The aim of this learning is that students are expected to be able to know the symptoms of operating system damage and the causes of the damage. The learning material is about problems that occur in computer operating systems, while the learning method uses the application of a scientific approach with the Discovery Learning model. In the core activity, the teacher engineers a problem by eliminating the computer operating system and asking students to observe the computer. The teacher asks questions to students about the engineering cases that have been given. The teacher explains to the students about the case that has been made up. At the end of the activity the teacher concludes the material that has been presented and provides the opportunity to ask questions. The teacher asks students to search for information via the internet to solve problems that have been engineered.

The second meeting was held on September 29 2020, Tuesday during lessons 1 and 4. Learning steps start from Pre-activities; namely the teacher enters the class and says hello after that together with the students recite a prayer, the teacher skips the students' attendance. After that the teacher explains the learning objectives and learning techniques. The aim of this learning is that students are expected to be able to understand the causes of operating system damage and how to overcome them. Learning material for causes of damage to the Windows operating system. In the core activity, the teacher explains several cases of damage to the Windows operating system and how to identify the damage. At the end of the activity, the teacher gave the students the task of looking for material information that had been provided on the internet as additional material, dividing the students into 6 groups where each group consisted of 5 people, consisting of one student. The teacher gives each group an assignment to write a paper about the steps for installing the Windows 10 operating system and concludes the learning material.

The third meeting was held on October 6 2020, Tuesday during lessons 1 and 4. The basic competencies are the same as meetings 1 and 2 with indicators that students understand the SOP for operating system installation. Learning steps start from Pre-activities; The teacher enters the class and says hello, after that together the students recite a prayer, the teacher skips the students' attendance. After that the teacher explains the learning objectives and learning techniques. The aim of this learning is that students hope to understand the SOP for operating system installation. About core activities; Students were asked to watch a broadcast on how to install the Windows 10 operating system. In this presentation the teacher emphasized the important things in installing the Windows 10 operating system. Based on the results of the implementation during cycle I, the data was obtained in **Table 1**.

Table 1. Average score of observations on student learning motivation in Cycle I.

NO	Assessed Aspects	Evaluation				
		0	1	2	3	4
1	Listening / paying attention to the teacher's explanation				√	
2	Vigorously perform group tasks				√	
3	Asking question /respond to questions			√		
4	Can work together in groups				√	
5	Actively read books/modules				√	
6	Can discuss the material in the module			√		
7	Enjoy doing assignments in the module			√		
8	Create portfolio reports			√		
Total				8	12	

Note. 0: Don't do; 1: Done poorly; 2: Done pretty well; 3: Well done; 4: Very well done; 10-16: Not interested; 17-24: Lack of interest; 25-32: Interested; and 33-40: Very Interested.

Based on the results in **Table 1**, it can be concluded that a score of 20 means students is less interested. The test results of students at the end of cycle I are shown in **Table 2**. From the results of the final test of cycle I, there were 10 students who did not complete their studies. Students who have not completed have taken part in a remedial program in the form of giving assignments independently and ending with a retest. As a result, three people have completed it, while one person has not yet completed it, so they are given a second remedial program as shown in **Figure 2**. Data analysis of the results of the final test of cycle I uses the Minimum Completeness Criteria (KKM) of 34.5% of students who have not yet completed it. To achieve the KKM you must take part in a remedial program and 65.5% of students who have reached or exceeded the KKM are given an enrichment program.

Table 2. Student test results at the end of cycle I.

No.	Gender	Many Students Complete Learning	Many Students Do Not Complete Learning	Many Learners Entirely
1	Men	14	8	22
2	Women	5	2	7
Total		19 (65,5%)	10 (34,5%)	29 (100%)

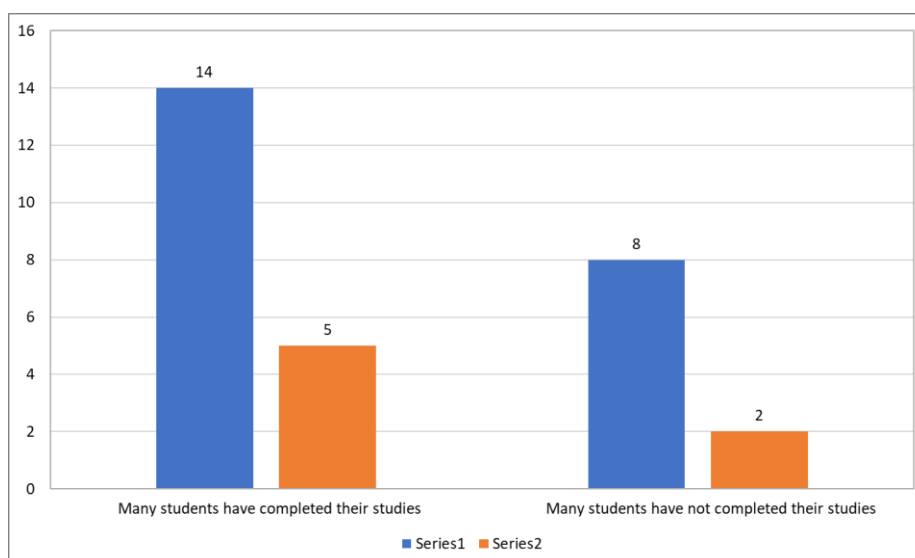


Figure 2. Cycle I test results.

3.1.2. Cycle 2

Based on the results of observations during cycle II, the following data were obtained. During learning, the average score of observations on student learning activities. It can be seen in **Table 3**.

Table 3. Average score of observations on student learning activities in cycle II.

NO	Assessed Aspects	Evaluation				
		0	1	2	3	4
1	Listening / paying attention to the teacher's explanation					√
2	Vigorously perform group tasks				√	
3	Asking question /respond to questions				√	
4	Can work together in groups					√
5	Actively read books/modules				√	
6	Can discuss the material in the module				√	
7	Enjoy doing assignments in the module					√
8	Create portfolio reports				√	
Total					15	12

Note. 0: Don't do; 1: Done poorly; 2: Done pretty well; 3: Well done; 4: Very well done; 10-16: Not interested; 17-24: Lack of interest; 25-32: Interested; and 33-40: Very Interested.

Based on the results in **Table 3**, it can be concluded that a score of 27 means students is interested. The test results of students at the end of cycle I are shown in **Table 4**.

Tabel 4. Learner test results at the end of cycle II.

No.	Gender	Many Students Complete	Many Students Do Not Complete	Many Learners
		Learning	Learning	Entirely
1	Men	20	2	22
2	Women	6	1	7
Total		26 (89,6%)	3 (10,4%)	29 (100%)

From the final test results in cycle II shows that there are still students who have not been completed. Those who have not completed will receive remedial and retests, while those who have achieved completion will then be given an enrichment program in **Figure 3**.

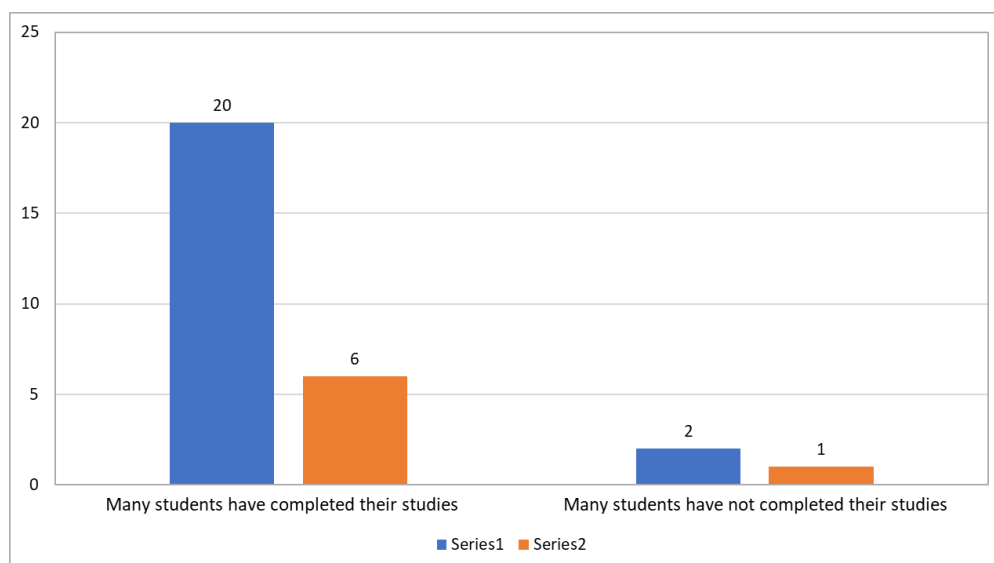


Figure 2. Cycle II test results.

Analysis of data from the final test results of cycle II using Minimum Completeness Criteria (as known as KKM) of 89.6%. Students who have reached or exceeded the KKM are then given an enrichment program. 10.4% of students who have not exceeded the KKM are given a remedial program. Based on these results, it can be seen that with the treatment in cycle II, 90% of students have exceeded the KKM and students' ability to install operating systems has increased.

3.2. Discussion

3.2.1. Learning observations

Observation results of learning management for each cycle using detailed learning management instruments. The results of the observations can be seen in **Table 5**. Based on the results in **Table 5**, it can be concluded that a value of $54/14 = 3.8$ means that the teacher has made the Learning Planning and implementation category "very good".

Table 5. Results of classroom action observations.

No.	Assessed Aspects	Evaluation			
		1	2	3	4
Planning:					
1	Creating RP				√
2	Preparing teaching materials				√
3	Formulate objectives (indicators)				√
4	Organizing materials				√
5	Choosing the right media				√
6	Choosing learning resources				√
7	Arranging measuring instruments				√
Total					28
Implementation:					
1	Motivate				√
2	Forming groups				√
3	Inform/explain			√	
4	Helping students who are experiencing difficulties			√	
5	Assisting students in learning				√
6	Assist students in making Conclusions				√
7	Create an evaluation				√
Total				6	20

Note. 1: Not done; 2: Pretty well done; 3: Well done; 4: Very well done;

4. CONCLUSION

Based on the results of the research and discussion described previously, it can be concluded that learning through the discovery method uses a scientific approach in its application, problem engineering must be created, so that children gain previously unknown knowledge not through notification but through a process of discovery (Discovery), so that it can increase motivation. and students' ability to learn and have an impact on increasing student learning outcomes.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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