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Improving Student Learning Independence by Applying the Peer-Tutoring Method in Basic Programming Subjects for Vocational High School

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ABSTRACT

Learning method is a method or effort made by the process of educators so that the teaching and learning process of student is achieved in accordance with the objectives. This learning method is very important to do so that the teaching and learning process is fun and does not make the students too tired, and the student can easily grasp the knowledge of the educators. One learning method that can be used to improve student abilities is using the peer tutoring method. The peer tutoring method is a learning pattern in which a person or several clever students are appointed by the teacher to provide learning assistance for students who are less intelligent. In this study, using the peer tutoring method in basic programing subject was proven to increase the independence of student.

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1. INTRODUCTION

The process of student learning is sometimes a separate thing that differentiates the level of understanding in absorbing the material conveyed by the teacher, there are some students who tend to be difficult to accept material, tend to be better silent or awkward to ask the teacher, they are more comfortable when asking friends.

In the process of online distance learning during the corona pandemic, the learning model that is applied will greatly affect the achievement of the objectives of a learning material. As well as possible the material that is prepared or the scenario that has been designed if it does not match the learning method presented, of course, will greatly affect the information and objectives absorbed by students. Learning activities are also an important part of curriculum implementation. Learning activities will be good when the learning components are also good, the components themselves consist of objectives, teaching materials, methods and media, evaluation, students, and educators (Sitepu *et al*., 2022).

A learning approach cannot be carried out without involving appropriate methods, so in each of the learning approaches above there are several methods that can be used. One example of a learning method is the Peer Tutoring method or peer tutors. Peer tutoring is a complex process in which students learn from more experienced students who have more knowledge of the material (Kim, 2015; Stigmar, 2016). Peer teaching is a learning technique that involves students themselves, especially students who already understand more about the material being conveyed to other friends (Kavanoz & Gulru-yuksel, 2010).

Subject "Basic Programming" with the subject matter of Creating Interface-Based Applications, students can master this subject/competence standard if they have previously been competent at competency standards: (1) Algorithms (2) Flowcharts, (3) Types of Data (4) Variables (5) Input-Process-Output. The time needed to complete this competency standard is 3 x 45 minutes. The facilities and infrastructure used for carrying out distance learning activities online include computers, the internet, teaching materials, PowerPoint presentation materials, C++ Programming Language, and books.

2. METHODS

This classroom action research was conducted at SMK N 2 Bandung in class X of the TKI Department using the Peer Tutoring method. The researcher uses this peer tutoring learning method because it has never been used and applied to Basic Programming subjects at SMK N 2 Bandung. In addition, the application of peer tutoring learning methods is expected to improve student learning outcomes.

Research time is the time used during the research. The research that will be carried out is applied in Basic Programming subjects which focus on the material of Creating User Interface-Based Applications. The time is adjusted according to the subject schedule and in accordance with the agreement with the school, namely July 31 - October 31, 2020.

2.1. Research Subject

The subjects in this study were students in class X TKJ 1 SMK Negeri 2 Bandung for the Academic Year 2020/2021, a total of 37 students. The research object used was to increase student independence by applying the Peer Tutoring Learning Model in Basic Programming Subjects at SMK Negeri 2 Bandung.

In language students are in a phase of growth and development both physically and psychologically, growth and development are characteristics of a student who needs guidance

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from an educator. Growth is related to the physical, development is related to the psychology (https://www.scribd.com accessed October 15, 2020).

According to Toto Suharto (2006: 123) students are God's creatures consisting of physical and spiritual aspects that have not reached the level of maturity, both physical, mental, intellectual, and psychological. Therefore, he always needs help, guidance, and direction from educators so that he can optimally develop his potential and guide him towards maturity.

2.2. Data Source

According to Dr. Harnovinsah, Ak (https://mercubuana.ac.id/pdf), data sources are divided into two, namely primary data and secondary data. Primary data is data obtained by researchers directly (first-hand). Examples of primary data are data obtained from respondents through questionnaires, focus groups, and panels, or also data from interviews with researchers with informants. While secondary data is data obtained by researchers from existing sources. Examples of secondary data include company records or documentation in the form of attendance, salaries, company published financial reports, government reports, data obtained from magazines, and so on.

The source of data used in supporting this research proposal is primary data in the form of a questionnaire given to students about ongoing learning and regarding interest in learning in the classroom.

2.3. Types and Research Design

In "this study, the type of research that researchers applied was classroom action research. According to Mulia and Suwarno (2016) classroom action research aims to improve and improve the quality of learning and to help empower teachers in solving learning problems in schools. Researchers want to "increase the independence of class X TKJ 1 student in productive subjects of computer and network engineering at SMK Negeri 2 Bandung. As an effort to increase "learning independence of students, researchers apply the Peer Tutoring method or peer tutoring in learning activities in class X TKJ A. Based on the involvement of researchers, classroom action research is divided into two types, namely participatory PTK or collaborative PTK".

The research design that will be used in this study modifies the example of the Real model. Riel (2007) divides the action research process into stages: (1) study and planning; (2) acting; (3) collection and analysis of events; (4) reflection. The process of "Real model action research" can be described in **Figure 1**.

2.4. Data Analysis Technique

Researchers "analyzed the data descriptively. According to Dr. Endang Mulyatiningsih descriptive data analysis is used to describe research data as it is and is not used to draw statistical conclusions. The results of descriptive data analysis are reported in the form of mean, median, mode, standard deviation, variance, minimum and maximum values, kurtosis (peak of the curve) and skewness (skewedness of the curve). Presentation of descriptive data aims to provide a brief overview of research results to make it easier to read and understand. In the research results will be reported "percentage of the average, minimum value and maximum value.

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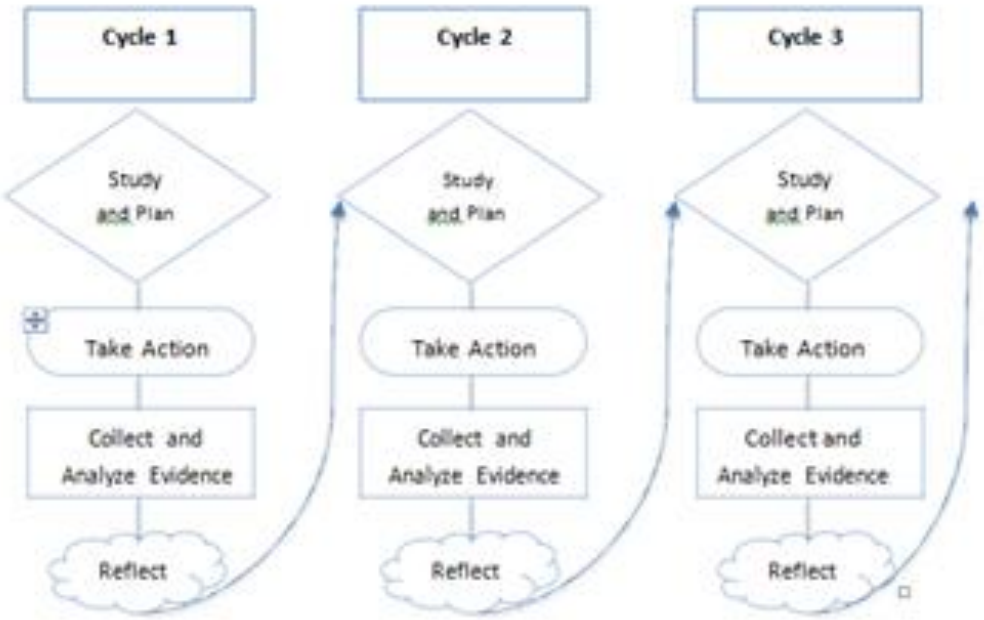

Figure 1. Real model action research process. source: book of applied research methods in education.

2.5. Success Indicator

From the several stages of the cycle carried out, the class action can be said to be successful if it has reached the KKM value that has been set by the researcher, namely 70, after the KKM value is fulfilled, in other words, the success criteria are achieved, the cycle can be **s**topped.

3. RESULTS AND DISCUSSION

3.1. Cycle I

The first meeting was held on September 15, 2020, Tuesday 1st class. Learning steps start from Pre-Activities, i.e., the teacher enters the class and greets after that together with the students read the prayer, the teacher takes the attendance of the students. After that the teacher explains the learning objectives and learning techniques. The basic competency is explaining the application interface creation procedure. The purpose of this lesson is that students are expected to understand the procedure for making the application interface. While the learning method uses the application of a scientific approach to the discovery learning model. In the core activities the teacher gives an example of the application interface display and instructs students to display the application interface. The teacher asks questions to students about the function of the application. The teacher explains to students about the function of the application that is displayed. 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 find information through the internet media about examples of application interface displays.

The second meeting was held on September 22, 2020, Tuesday, 1st lesson. The learning steps start from Pre activities, i.e., the teacher enters the class and greets after that together with the students read the prayer, the teacher takes the attendance of the students. After that the teacher explains the learning objectives and learning techniques. The purpose of this study is that students are expected to be able to understand the input output data of application users. Learning material input output data. In the main activities the teacher

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explains several examples of application user data input output. At the end of the activity, the teacher gives assignments to students to find information about the material that has been provided on the internet as additional material.

The third meeting was held on September 29, 2020, Tuesday, 1st class hour. With basic competencies, namely implementing procedures for making data input interfaces from users with data validation. The learning steps start from Pre activities; the teacher enters the class and greets after that together with the students read the prayer, the teacher takes the attendance of the students. After that the teacher explains the learning objectives and learning techniques. The purpose of this lesson is that students are expected to be able to apply the procedures for making data input interfaces from users with data validation. In core activities, Students are asked to make a flowchart of the application to be designed (see **Figure 2**).

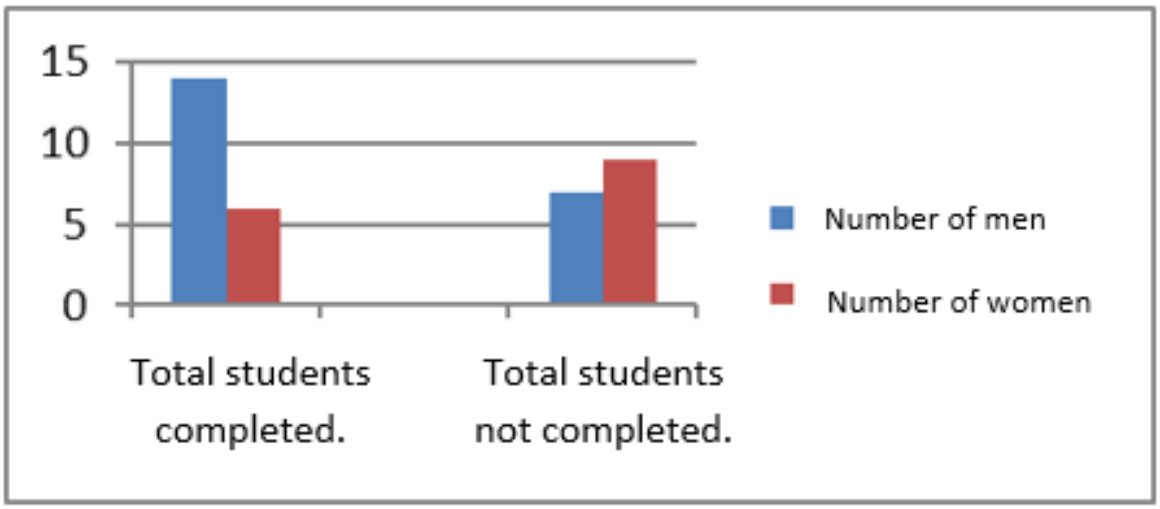

Figure 2. Graph of cycle I test results.

Analysis of data from the final test results of cycle I am using the Minimum Completeness Criteria (KKM) of 41.66%. Students who have not reached the KKM must take part in a remedial program. 58.33% of students who have reached or exceeded the KKM are given enrichment programs.

3.2. Cycle II

From the results of the final test in cycle II, it shows that there are still students who have not finished. For those who have not completed it will receive remedial and retest while those who have achieved completeness will then be given an enrichment program.

Analysis of data on the results of the final cycle II test using the Minimum Completeness Criteria (KKM) of 72.22%. Students have reached or exceeded the KKM and will then be given an enrichment program. And the remaining 27.77% has not been completed and will be given a remedial program.

Here it can be seen that with the treatment in the second cycle, almost 90% of students have exceeded the KKM and students' ability to understand the input output data of application users (see **Figure 3**).

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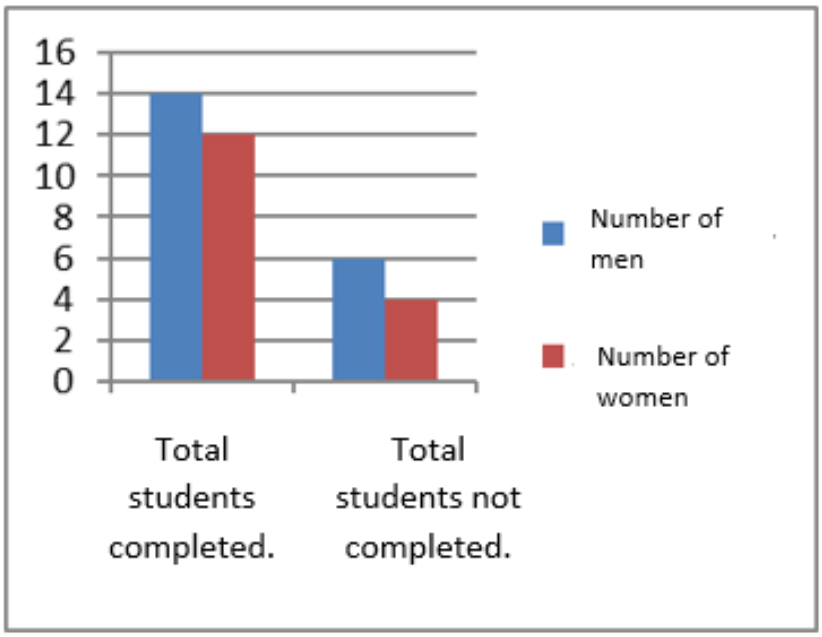

Figure 3. Graph of cycle II test results.

3.3. Cycle III

From the results of the final test in cycle III there was an increase in student interest in learning, but there were students who had not completed it. For those who have not completed it will receive remedial and retest while those who have achieved completeness will then be given an enrichment program (see **Figure 4**).

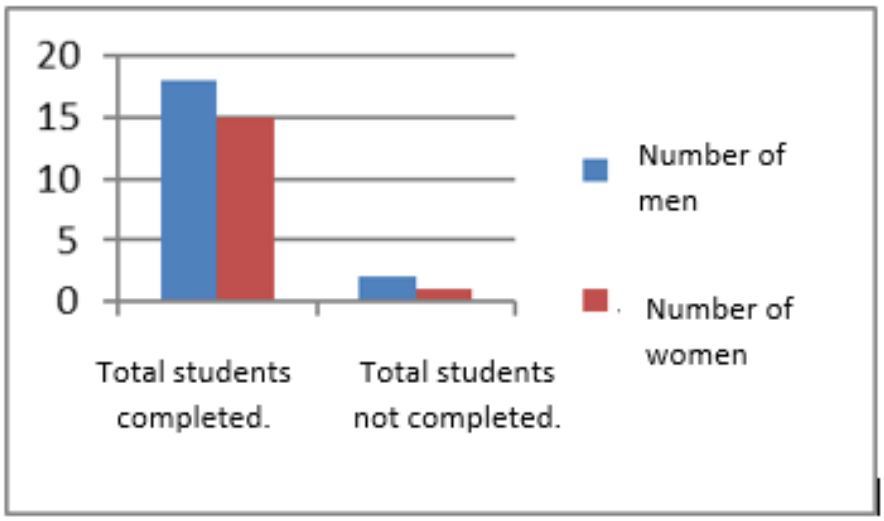

Figure 4. Graph of cycle III test results.

Analysis of data on the results of the final cycle II test using the Minimum Completeness Criteria (KKM) of 91.66%. Students have reached or exceeded the KKM and will then be given an enrichment program. And the remaining 8.33% has not been completed and will be given a remedial program.

Here it can be seen that with the treatment in the third cycle, more than 90% of students have exceeded the KKM and there is an increase in student learning interest by applying the peer tutoring model to Basic Programming subjects.

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3.4. Learning Observation

Results Observations on the management of learning in each cycle using detailed learning management instruments. The results of his observations can be seen in **Table 1**.

Tabel 1. Results of observation of learning.

No	Aspects Assessed	Assessment			
	Planning:	1	2	3	4
1	Make RPP				
2	Customize teaching materials				✓
3	Formulate goals (indicators)				✓
4	Organizing materials				✓
5	Choose the right medium				✓
6	Choose learning resources				✓
7	Develop measuring instruments				✓
	Total				28
	Implementation:	1	2	3	4
1	Motivating				✓
2	Form groups				✓
3	Provide information / explain			✓	
4	Help students who are having difficulties				
5	Assist students in learning			✓	
6	Assist students in making conclusions				✓
7	Make an evaluation				✓
	Total			9	16

Description Rating Scale:
1: Not good
2: Well done
3: good
4: Very good

Score 53/14 = 3.7 means that the teacher has made Planning and Implementation of Learning in the "good" category.

4. CONCLUSION

Based on the results of the research and discussion described earlier, it can be concluded that learning through the Peer Tutoring method uses a scientific approach in its application, engineering problems must be made, so that children acquire knowledge that was previously unknown not through notification but through the process of discovery (Discovery), so as to improve students' motivation and 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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