APPLICATION OF PEER TUTORING LEARNING METHODS IN VOCATIONAL SCHOOL STUDENTS

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KEYWORDS	ABSTRACT
Learning Outcomes Classroom Action Research Peer Tutors	The learning process is a part that plays an important role in the success of learning. The selection of the right method is one way for the learning process to work as expected. Peer tutoring method is one of the interactive learning methods involving students who are competent in the material taught so they can provide learning guidance to other students. This study aims to improve student learning outcomes in the realm of knowledge and skills through the application of peer tutoring methods. This research is a Classroom Action Research (CAR) conducted in 2 cycles with 4 stages, namely planning, implementation, observation and reflection. The subjects in this study were 34 vocational high school students. Data collection methods used include observation, tests, performance and interviews. Test the validity of the data using data triangulation. The research data was analyzed using a comparative descriptive percentage analysis technique. From the data obtained shows that the application of peer tutoring methods can improve student learning outcomes by 88.23% in the realm of knowledge and 91.17% in skills. From the results of the study it can be concluded that the application of peer tutoring methods can improve the learning outcomes of Vocational High School students.

INTRODUCTION

The purpose of learning is to convey and guide students to be able to understand and know well the knowledge delivered in order to get the desired learning outcomes. But in reality based on solidwork learning outcomes in the midterm exam class XI A Machining results obtained very low learning outcomes, of which the number of students as many as 34 students who get completion scores only as many as 10 students while 24 students get scores under minimum criteria.

From the results of observations of pre-cycle activities, information was obtained that the low value of student learning outcomes was inseparable from the lack of students' understanding of *solidwork*, this was because the learning process of manufacturing images using *solidwork* was the first time they received it. In line with this, the learning process also runs passively, there is no cooperative communication between students and there is still a lack of motivation and enthusiasm that students have in participating in learning.

In line with the above, the application of peer tutoring learning methods can enhance creativity and learning outcomes (Yawan Rudi, 2017). Furthermore, the use of peer tutoring learning methods can also improve student learning outcomes (Sudarsono and Susanto, 2013) (Indriani, 2013). Based on the results of relevant research and reviewing existing problems, the researchers intend to apply peer tutoring methods as an effort to overcome problems in student learning outcomes in Vocational High Schools.

RESEARCH METHODS

This research is Classroom Action Research. This classroom action research is a review process through a cyclical system (Arikunto: 2010). Each cycle goes through the stages of action planning, implementation, observation, and reflection.
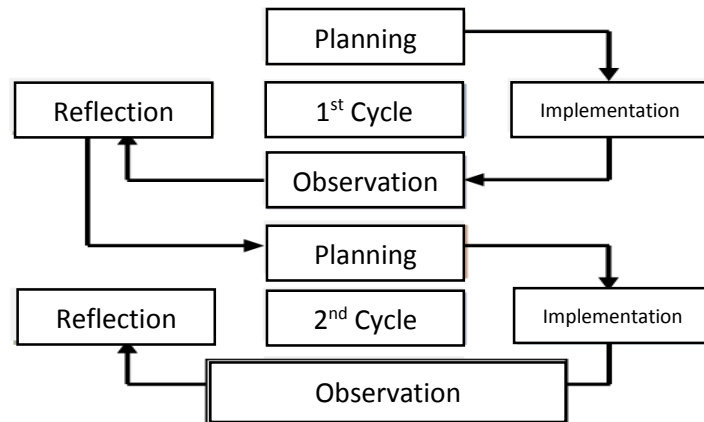

Figure 1. Classroom Action Research Procedure (Arikunto, 2010)

This research was conducted at the Surakarta Warga VOCATIONAL HIGH SCHOOL. This research was conducted in the even semester of the 2017/2018 school year, while the subject of this study was the XI A class of Surakarta Warga VOCATIONAL HIGH SCHOOL machining in the 2017/2018 academic year, which amounted to 34 students.

Data collection techniques in this study were conducted using four methods, namely observation, tests, performance and interviews.

a. Observation

The observation stage in this study was conducted to find out how much influence the application of peer tutors on the continuity of the teaching and learning process, and to observe the performance and role of the tutors in providing tutoring to peers.

b. Test

In this study, learning outcomes in the realm of knowledge were obtained using test instruments in the form of essay and multiple choice questions that were adjusted to the achievement of learning objectives.

c. Job Performance

Student learning outcomes in the psychomotor domain (skills) are carried out by providing worksheets compiled by adjusting the indicators of learning success.

d. Interview

this study, the interview phase was carried out to explore information about the effect of applying peer tutoring to students in participating in learning.

In this study, test the validity of the data using data triangulation techniques, where the results of data collection techniques are tested for validity by comparing the results of various kinds of collection techniques, such as observation, tests, performance evaluation and interviews. The data obtained are then analyzed by comparing with the data obtained from each method used. Data analysis techniques used comparative descriptive quantitative percentage analysis techniques.

RESULTS AND DISCUSSION

  A. **Cycle I**

   1. **Planning Action**
      a. Compile basic competencies and core competencies.
      b. Make a learning implementation plan (RPP).
      c. Make student worksheets.
      d. Make an evaluation tool as a measure of the success of students in participating in learning.

   2. **Implementation of Action**

The sequence of actions in the first cycle is as follows :
a. Condition students into Lab. CADD and maintain a conducive atmosphere.
b. Open the lesson by saying hello and proceed with prayer.
c. Do attendance to find out the presence of students.
d. Invite students to turn on the computer and open solidwork software.
e. Provide evaluation of learning at the previous meeting.
f. Provide apperception to foster students' curiosity about the material to be delivered.
g. Describe the competencies achieved by students after learning.
h. Explain learning material with demonstration methods and tutorials about assembly and commands to make part assembly and explain the steps in drawing part assembly on solidwork.
i. Ensure students understand the material presented.
j. Students start working on the work drawings that have been given.
k. Students who have finished working on the given working drawings are chosen as 5 people to become tutors to help and teach other friends who have difficulty in learning.
l. Students who become tutors begin to accompany other friends to provide explanations and direction in order to increase the understanding of other students.
m. Students who have finished working on the work drawings are asked to save their work.
n. Instruct all students to sit in their respective positions.
o. Next provide evaluation questions to all students to measure the success of students in participating in learning.
p. Before closing the lesson, students are asked to first.
q. conclude all material that has been submitted during the process.
r. learning takes place.
s. Learning is closed by providing coverage of the material at the next meeting and providing motivation and ending with closing greetings.

3. Observation

At this stage an observation of the learning process is carried out by applying the peer tutoring method. This observation activity was conducted to determine the effect of the peer tutoring method during the learning process.

4. Assessment

a. Cognitive Learning Outcomes

Table 1. Range of Values in Cycle Cognitive Field Test Results

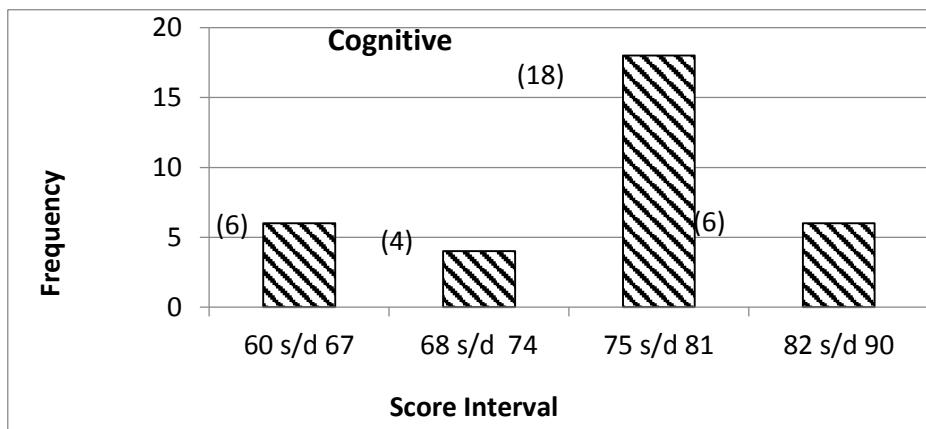| No	Score Interval	Frequency
1	82 - 90	6
2	75 - 81	18
3	68 - 74	4
4	60 - 67	6
Total Students		34

Figure 2. Histogram Value of Learning Outcomes Cognitive Domain Cycle I

b. Learning Outcomes of the Psychomotor

Table 2. Range of Value of Psychomotor Cycle I Test Results

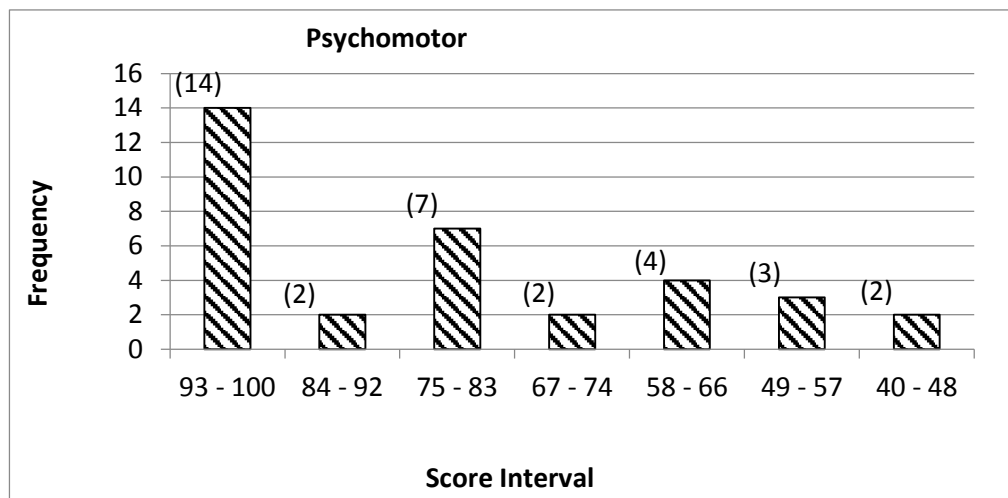| No	Score Interval	Frequency
1	93 – 100	14
2	84 – 92	2
3	75 – 83	7
4	67 – 74	2
5	58 – 66	4
6	49 – 57	3
7	40 – 48	2
	Total students	34

Figure 3. Histogram Value of Learning Outcomes Psychomotor Sphere Cycle I

5. Disscusion

Based on the value of student learning outcomes taken from the value of the test and the value of work results in learning manufacturing drawing techniques with solidwork has experienced an increase in learning achievement. This is evidenced by the percentage of student success as follows:

Table 3. Percentage of Cycle I Learning Outcomes

No	Aspect	Percentage	
		Pra Cycle	Cycle I
1.	Cognitive	29.41 %	71.02 %
2.	Psyschomotor	29.41%	64.70 %

6. Reflection

The results of the interview show that in the application of peer tutoring methods in the learning process the first cycle has had a positive impact, but in its implementation there are still some weaknesses that must be evaluated and corrected, the weakness is the lack of tutors and the tutors are still confused in explaining the material to participants other students.

B. Cycle II
1. Planing action
  a. Compile basic competencies and core competencies.
  b. Make a learning implementation plan (RPP).
  c. make student worksheets.
  d. Make learning evaluation tools..
2. Implementation of Action

The sequence of actions in cycle II is as follows :
a. Condition students into Lab. CADD and maintain a conducive atmosphere.
b. Open the lesson by saying hello and proceed with prayer.
c. Do attendance to find out the presence of students.
d. Invite students to turn on the computer and open solidwork software.
e. Provide motivation and evaluation of learning at the previous meeting.
f. Provide apperception to foster students' curiosity about the material to be delivered.
g. Describe the competencies achieved by students after learning.
h. Describe learning material with demonstration methods and tutorials about commands and steps in building projection assembly.
i. Students are welcome to start working on the work drawings that have been given.
j. Students who have finished working on the working drawings given are selected as many as 8 people to become tutors to help and teach other friends who have difficulty in learning. At this stage, the number of tutors is added to overcome problems in the first cycle which are considered to be lacking.
k. Students selected to be tutors are first given guidance on the steps in providing guidance and provide an explanation of the targets for achievement in learning. In this stage, giving guidance and explaining to the tutors about the steps to explain the material to other students is a solution to the problem of the first cycle which the tutors feel is still difficult in explaining the learning material.
l. Before being invited to guide other students, students who become tutors are first given testing and motivation to work optimally. Testing and giving motivation is a step taken to overcome the problem in the first cycle where the tutors look a little lack of motivation in providing guidance to other students.
m. Students who become tutors begin to accompany other friends to provide explanations and direction in order to increase the understanding of other students.
n. The soul who has finished working on the work drawings is asked to keep the work.
o. Instruct all students to sit in their respective positions.
p. Next provide evaluation questions to all students to measure the success of students in participating in learning.
q. Before closing learning, students are asked to conclude all the material that has been delivered during the learning process.
r. Learning is closed by providing material coverage at the next meeting and providing motivation and ending with closing greetings.

3. Observation
At this stage an observation of the learning process is carried out by applying the peer tutoring method. This observation activity is carried out to determine the effect of the tutor method during the learning process.

4. Assessment
Based on the results of the test and the assessment of student work results obtained by the learning outcomes obtained by students after the application of peer tutoring methods during the learning process takes place. The following are student learning outcomes in cycle II learning:
a. Cognitive Learning Outcomes

Table 3. Range of Cycle II Cognitive Test Results

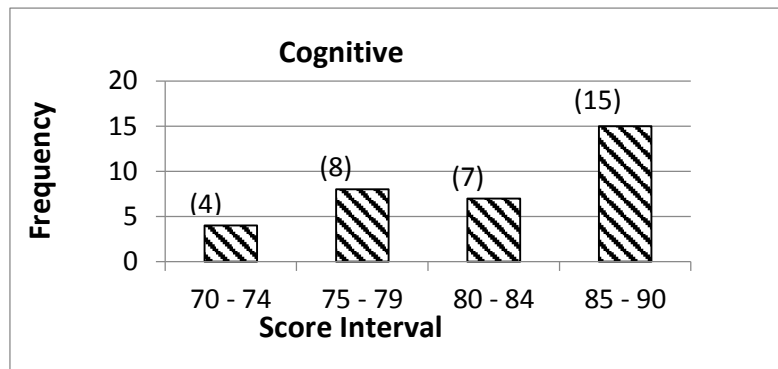| No.	Interval	Frequency
1	85 – 90	15
2	80 – 84	7
3	75 – 79	8
4	70 - 74	4
Total Student		34

Figure 4. Histogram Value of Learning Outcomes Cognitive Domain Cycle II

b. Learning Outcomes of the Psychomotor Realm

Table 4. Range of Values of Psychomotor Cycle II Test Results

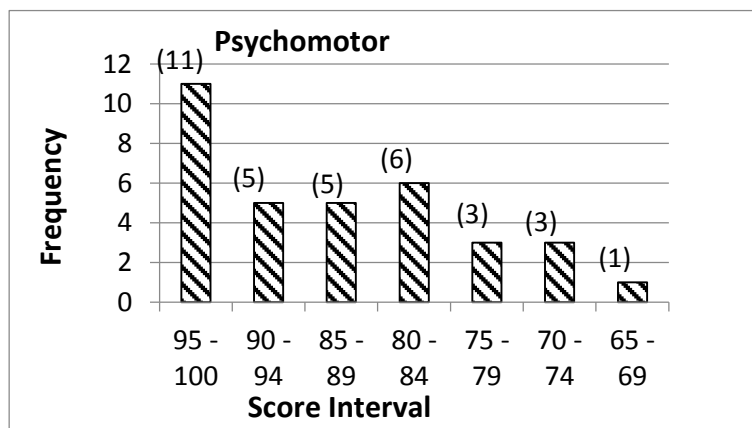| No	Interval	Frequency
1	95 – 100	11
2	90 – 94	5
3	85 – 89	5
4	80 – 84	6
5	75 – 79	3
6	70 – 74	3
7	65 - 69	1
	Total Student	34

Figure 5. Histogram Value of Learning Outcomes in the Psychomotor Cycle II

5. Disscusion

Based on the value of student learning outcomes taken from the value of the test and the value of work results in the learning cycle II shows that student learning achievement has increased after the peer tutoring method is applied. This is evidenced by the percentage of student success as follows:

Table 5. Percentage of Cycle II Learning Outcomes

No	Aspect	Percentage	
		Cycle I	Cycle II
1	Cognitive	71.02 %	88.23 %
2	Psychomotor	64.70 %	87.79 %

6. Cycle II Reflection

Student learning outcomes in learning cycle II show that the learning process using peer tutoring methods can improve student learning outcomes. The success of the application of peer tutoring methods in the second cycle of learning can not be separated from the evaluation and improvement of the first cycle, where the improvement lies in providing guidance to tutors, the number of tutors added and provide motivation to tutors about the importance of cooperation and mutual assistance in peers .

Improving student learning outcomes through the application of peer tutoring methods has been successfully implemented, but in its implementation there are still some weaknesses that are found in the use of this method. This can be seen from the percentage of student success that not all students can succeed in getting the desired learning achievement.

After the post-action learning cycle II was obtained, the interview phase was carried out to students to find weaknesses and shortcomings of using peer tutoring methods.

The results of the interview show that the application of peer tutoring methods has several advantages and disadvantages in its application. Aside from being a solution to achieving student learning outcomes, it would be better if the application of peer tutoring methods was applied by paying attention to several things including the character of students, motivation, and the most important thing was ensuring a relationship situation between peers in good condition so that the peer tutoring method could walk maximum.

CONCLUSION

Based on student learning outcomes after the implementation of the action, it can be concluded that the application of peer tutoring methods can improve student learning outcomes in class XI A Manufacturing Engineering subjects in the 2017/2018 Academic Year. From the learning outcomes obtained by students after the implementation of the action obtained several conclusions as follows:

1. Application of peer tutoring methods in the learning process of Manufacturing Image Engineering using solidwork software is able to improve student learning outcomes in the cognitive domain, where the percentage of success of students in the first cycle is 70.58% and in the second cycle increases by 88.23%.

2. Application of peer tutoring methods in the learning process of Manufacturing Image Engineering using solidwork software is able to improve student learning outcomes in the psychomotor domain, where the percentage of success of students in the first cycle is 64.70% and in the second cycle increases by 91.17%.

SUGGESTION

Based on the results of the research actions and conclusions above, the researchers found several suggestions that could be taken into consideration and input in order to increase the effectiveness of the application of peer tutoring methods in other learning processes, these suggestions are as follows:

1. Selection of students who will become tutors should not only be in terms of the value of learning outcomes, but by reviewing other aspects such as students' communication skills and relationships with other students.
2. Providing guidance and debriefing for students who become tutors is very necessary, so that the role of tutors in providing guidance to other students can run optimally.

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