Effectiveness of Prop Assignment on The Ability to Analyze and Present Data to Sman 9 Semarang Students

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Article Info	Abstract
	This research aims to analyze the effectiveness of the assignment of props to the ability to analyze and present data to students of SMA Negeri 9 Semarang .This research design uses pre-experimental with one group pretest posttest design. The research population is all students of class XI MIPA SMA Negeri 9 Semarang. Sampling techniques using purposive sampling i.e. class XI MIPA 5, XI MIPA 6 and XI MIPA 7 as experimental classes without control classes, pretest and posttest values are analyzed using N-gain tests and wilcoxon tests. The results showed an increase in class XI MIPA 5 with N-Gain 1.73 percentage of classical completion reached 80.00% (KKM ≥75), class XI MIPA 6 with n-gain 1.63 by 88.24% pass KKM and class XI MIPA 7 with ¬N-Gain 1.50 by 75.00% pass KKM. The wilcoxon test showed that there was a significant difference in students' analytical ability between before and after learning with the assignment of props in the experimental class with Ha received, namely Sig grades. 0.000 or <0.05. The results of the ability analysis presenting data to students throughout the experimental class are on high criteria. All data obtained can be used as a reference that the assignment of props is effective to improve the ability to analyze and present data to students.

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INTRODUCTION

The learning guidelines stipulated in Law No. 20 of 2003 on the National Education System state that the learning process is organized interactively, fun, challenging, inspiring, motivates learners to participate actively, as well as provide sufficient space for initiative, creativity, and independence in accordance with the talents, interests, abilities, and physical and psychological development of learners. The 2013 curriculum demands a change in teacher-centered learning patterns into students centered learning. SMA Negeri 9 Semarang is one of the high schools in the city of Semarang that has implemented the 2013 Curriculum in the implementation of the learning process. With this, the demand to change the learning patterns that were originally teacher-centered to student-centered as mentioned above also applies. A commonly used alternative is the discussion method. However, in addition to discussions, learning by involving students directly such as the implementation of practicum also needs to be applied. Practicum can be interpreted as a series of activities that allow the application of various science skills and the development of scientific attitudes that support the process of acquiring knowledge in students (Subiantoro, 2010). The learning process will also be meaningful when students interact directly with the objects studied (Sagala, 2010). Practicum aims to know the student's learning outcomes which include knowledge, attitudes and skills in accordance with the demands of competence in the curriculum developed today (Damyati and Mudjiono, 2013).

Biological learning materials generally require a practicum in the process of implementation. One of them is plant tissue material in the odd semester of class XI IPA which includes the structure of plant tissues, the properties of totipotence and organs in plants. The results of observations on the value of student learning outcomes in XI IPA in 2019 showed that in the Plant Network material 81.25% of students who obtained grades above KKM that had been set at 70, the rest did not pass KKM with an average score below 60. While the results of UN biology grades of SMAN 9 Semarang students in the 2019/2020 school year showed absorption in the plant tissue sub indicator at 59.26% from a minimum of 55%. For the national level, the absorption of plant tissue sub-indicators tested only reached 49.47% of the minimum figure of 55%. From these data it can be known that plant tissue material belongs to material that is difficult for students to understand. The value of students who do not reach KKM is far below the standard KKM that has been set and the absorption of the material is still close to the minimum number. In fact, the implementation of learning in the Plant Network chapter has been carried out with practicum activities. This fact requires teachers to have alternatives to improve students' learning outcomes so that learning indicators can be achieved, especially with conditions that require special attention due to pandemics.

Previous research conducted by Markus and Hendrukus (2016) on the influence of PBL on problem-solving skills and cognitive learning outcomes of students resulted in the conclusion that the use of problem based learning (PBL) models can improve students' problem-solving skills and cognitive learning outcomes. Relevant research was also conducted by Fransina and James (2014) on the Effect of The Use of Props from Used Materials on The Circulatory System in Humans On Biological Learning Outcomes High school students concluded based on the results that have been obtained that the use of prop media in learning shows a better influence on student learning outcomes compared to the learning outcomes of students who are not treated. Similar research was conducted by Nomleni & Merukh (2015). The use of props in learning showed a more significant improvement in student learning outcomes compared to the learning outcomes of students whose learning process was carried out without the use of props. The above-mentioned research shows the successful application of PBL in improving students' ability to solve problems and the use of props in improving student learning outcomes, the application of PBL with the use of props into a combination of strategies that can be applied by researchers as alternative solutions to achieve learning goals as stated in KD in the form of the ability to analyze and present data.

METHOD

This study was conducted at Sma Negeri 9 Semarang using the Pre-Experimental method with Pretest-Posttest One Group Design purposive sampling technique was carried out in September-October 2020. The study used three experimental classes: class XI MIPA 5, XI MIPA 6 and XI MIPA 7 using prop assignment. The data collected in this study is cognitive learning outcomes in the form of pretest and posttest grades as a result of the ability to analyze students and data on student assignment reports as data on the ability to present data to students. The test instrument test was analyzed using the Anates V4 application.

Pretest and posttest data were analyzed to determine the improvement in learning outcomes using Ms.Excel with the N-Gain test subsequently tested for normality using SPSS 22 and tested for differences with non-parametric analysis with wilcoxon tests because the data was not distributed normally. The conduct of research is done online from the beginning of the research to completion.

RESULTS AND DISCUSSIONS

The study was conducted with several changes due to pandemic conditions. At first the assignment is done in a group, but to adjust the conditions are done each individual. Data retrieval is done online through google form beginning with the process of discussion with teacher assistance. The results of the research that has been done can be seen in the following table.

Table 1. Student learning outcomes

Student learning outcomes	XI MIPA 5		XI MIPA 6		XI MIPA 7	
	Pretest	*Posttest*	*Pretest*	*Posttest*	*Pretest*	*Posttest*
N (Number of students)	35	35	34	34	36	36
Maximum	71	93	79	86	79	93
Minimum	21	64	21	64	14	61
N-Gain	1.73		1.63		1.50	
Ketuntasan Klasikal Siswa (%)	80.00%		88.24%		75.00%	

Table 1 shows an analysis of students' pretest and posttest results, classical completion and N-Gain grades from each experimental class. From the data, it is known that all three classes have increased. This can be seen from the classical completion of students and the results of N-Gain value analysis obtained, thus learning to use PBL with the assignment of props can be said to improve the ability to analyze students in plant tissue materials. The research data obtained is not normal distribution. Therefore, to find out the difference between the two groups is done wilcoxon test shown in the following table.

Table 2 Wilcoxon Test

Test Statistics[a]	
	pottest – pretest
Z	-8.865[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Table 2 shows that there is a significant difference in students' analytical ability between before and after learning using prop assignments in experimental classes with Ha accepted (Sig. 0.000 or <0.05) grades).

Analysis of project reports as the ability to present data to students

Data capability to present data to students obtained from the results of project reports collected in the form of videos through Google Drive that have been prepared by researchers. Student project results are used as supporting data to find out the effectiveness of PBL learning with the assignment of props that have been given.

In table 3, a recap of the results of the student assignment assessment of the entire experimental class is presented.

Table 3 Assessment of Student Assignment Results

Class	Percentage of completion of the ability to present data	Categories
XI MIPA 5	80%	Medium
XI MIPA 6	77%	Medium
XI MIPA 7	78%	Medium

Table 3. Demonstrate the results of the analysis of the ability to present data across all classes of experiments. Learning using prop assignments can be said to be effective because the classic completion of the entire class is in a pretty good category.

The application of biological learning in SMAN 9 Semarang using the PBL method with the assignment of props in the plant network chapter shows good results with the achievement of the KKM that has been established, so that automatically basic competencies can be met. From the results of the study can be known student learning results as an indicator of analytical ability to increase (table 1) between before being treated and after being treated with the application of PBL learning with the assignment of props in the plant tissue chapter. These results were reinforced by the percentage of classic completion of posttest values in each class of experiments has exceeded the set KKM limit (table 1) compared to the classic completion of the pretest results that have been done. The statement is in line with research conducted by Supiandi & Julung (2016). In their research, the results of statistical analysis of wilcoxon tests (table 2) showed that learning models significantly affect the problem-solving ability and cognitive learning outcomes of students. The results obtained are closely related to the learning activities applied. Learning with the PBL model involves students actively in understanding the concepts and principles of a material because these learning characteristics are in the form of problem submission to students.

The ability to analyze students is measured based on the results of students' cognitive tests before and after learning. The cognitive skills students use to measure analytical skills in students include (Distinguishing, Organizing and Linking) (Fadly, et al 2021). Learning using PBL on plant tissue material is done with a scientific approach that is practicum conducted independently by students with the manufacture of props. The assignment of props is given to students as an observation activity on the structure and function of plant tissues. Through props made students are able to observe the structure and function of plant tissues, thus students are also able to analyze the relationship between the structure of plant tissue and the functions it performs. A series of activities in the assignment of props produces the final product in the form of presentation of data obtained from the results of observations and analysis of students to answer the problems that have been given at the beginning of learning.

Data collection to measure the ability to present data to students is done through the collection of reports in the form of uploaded videos via google form folders that have been provided to strengthen the learning reach that has been done. Overall the data obtained has reached the indicator of the success of learning implementation (table 3). All three classes of experiments obtained a percentage of the ability to present data in a fairly good category. Based on videos that show their reporting of observations and analysis that have been done, it can be known that students are enthusiastic in working on the assignment of props. This is evidenced by the resulting props complying with the provisions that have been submitted. The submission of students in reporting has also been in accordance with the instructions given. With the data obtained, PBL learning by making props in the plant network chapter can be said to be effective to achieve basic competencies that have been established. This is reinforced by the opinion of Vienna putra in (Nomleni & Merukh 2015) that the average information that a person obtains through the senses is 75% through vision (visual), 13% through hearing (audio), 6% through touch, and 6% through smell and tasting, which means the use of props as a visual medium in learning has a major influence on the success of the learning process carried out. However, the sense of sight is not the only factor at play. Factors other than

visual are what cannot be met in this study. So that the data obtained only managed to achieve the criteria quite well.

Based on the research that has been done the whole variable can be measured well. The implementation of research can only be done through online methods because of the condition of the region that must comply with health protocols. This makes students have to adapt again and researchers rearrange the instruments used for the process of retrieving measured variable data. Limitations in this study are about determining the research variables to be measured not made initial observation, namely the ability to present data so that only the final results can be seen in the form of effectiveness. Therefore there cannot be seen an improvement in the measurement of the ability to present data.

CONCLUSION

Based on the results of research and discussion, it can be concluded that the application of prop assignments in the biology learning chapter of the Plant Network is effectively applied to improve the ability to analyze and present data to students of class XI SMAN 9 Semarang.

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