

The Effect of The Web-based Learning Media on Learning Outcomes

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Abstract. This study is motivated by the low student learning outcomes on computer and basic networks subjects. The purpose of the research was to see the effect of using web-based learning media on student learning outcomes in understanding learning material. The research method using one-group pretest-posttest. The results showed that there was an effect of learning outcomes between pre-test and post-test with a significance of 0,368. It is concluded that web-based learning media can improve student learning outcomes so that it can be used as a learning resource on computer and basic networks subjects.

1. Introduction

The computer and basic network are subjects of vocational components and are included in the group of productive subjects that must be controlled by all vocational high school graduates. Competencies that must be mastered by students are understanding about computer components, applying computer installation methods and understanding computer network material. During the learning process students still experience difficulties in understanding these competencies, this has an impact on student learning outcomes. Student learning outcomes are obtained from understanding the competencies that have been learned by students during learning [1], [2].

Observations made on 10th grade students at the vocational high school 1 Painan, found data as much as 41% of students who achieved the minimum completeness criteria. Based on the national education department, a class is said to be complete if there are 85% of all students achieving completeness criteria [3]. The acquisition of learning outcomes which are still much below the minimum completeness criteria is influenced by several factors. The problem experienced is the loss of students' interest in learning because the learning process still depends on the material given by the teacher in the class, where they only follow the steps that are already there so students cannot think independently [4], [5]. Students also cannot ask what, why, how, so that their innovation and creativity are limited [6].

Based on these facts, teachers can innovate in the learning process by utilizing the advances in information and communication technology. Integration of information technology in meeting the needs of the learning process as an alternative to assist students in understand learning [7], [8]. One alternative is the use of information and communication technology by implementing web-based

learning media. Implementation of web-based learning media can help students to learn independently and can overcome the problems of learning time and improve student learning outcomes [9], [10].

Web-based learning media is a relatively quick way to distribute learning resources and can be update, so that the information received can help improve the understanding of the students [11]. Web-based learning media can also support e-learning activities such as quizzes, forums, task delivery, and assessment [12], [13]. Based on the description above, the purpose of this study is to see the effect of using web-based learning media on student learning outcomes. It is expected that web-based learning media can improve students' understanding of computer and basic networks subjects.

2. Research Method

The research design used in this study was One Groups Pretest-Posttest design, namely by doing a pre-test before being given treatment and post-test after receiving treatment [14]. Where in this study is to compare learning outcomes before using web-based learning media (pre-test) and after using web-based learning media (post-test). The subjects of the study were conducted on 10th grade students as many as 32 students in vocational high school 1 Painan on the computer and basic network subjects. This research activity aims to assess the differences in the influence of the use of web-based learning media on improving learning outcomes. Significant testing can be done with paired sample t-test.

2.1. Learning Completeness

Learning completeness can be determined using the following equation:

$$KB = \frac{T}{T1} \times 100\% \quad (1)$$

Information:

KB = Learning completeness

T = Number of scores obtained by students

T1 = Total score

2.2. Normality test

The normality test is useful for determining data that has been collected normally distributed or taken from a normal population, using the Kolmogorov-Smirnov method. If $L_{count} < L_{table}$, then the data is normally distributed. If $L_{count} > L_{table}$ then data is not normally distributed.

2.3. Paired sample t-test

Paired sample t-test serves to see significant differences between learning outcomes before and after using web-based learning media. The decision criteria are if $t_{count} < t_{table}$ then there is a significant effect on student learning outcomes before and after using web-based learning media. If the value of $t_{count} > t_{table}$ then stated there is no significant effect on student learning outcomes before and after using web-based learning media.

3. Results and Discussion

3.1. Pre-test result data

The data obtained after the initial test was carried out to students was analyzed to find out the distribution of data, the average value, and the standard deviation of the data obtained. Based on data analysis, the following results are obtained (a) the average score is 51,62 (b) the highest score is 87 (c) the lowest score is 20 (d) the standard deviation is 16,44. These data are learning outcomes before applying web-based learning media.

3.2. Post-test result data

The data obtained after using web-based learning media are analyzed to find out the distribution of data, the average values, and the standard deviation of the data obtained. Based on the analysis of data obtained the following results (a) the average score is 83,46 (b) the highest score is 100 (c) the lowest score is 67 (d) the standard deviation is 9,07. Post-test data is the final test after students are given treatment using web-based learning media that is followed by 32 students. The description of the distribution of pre-test and post-test values can be seen in Figure 1.

Pretest and Posttest Results

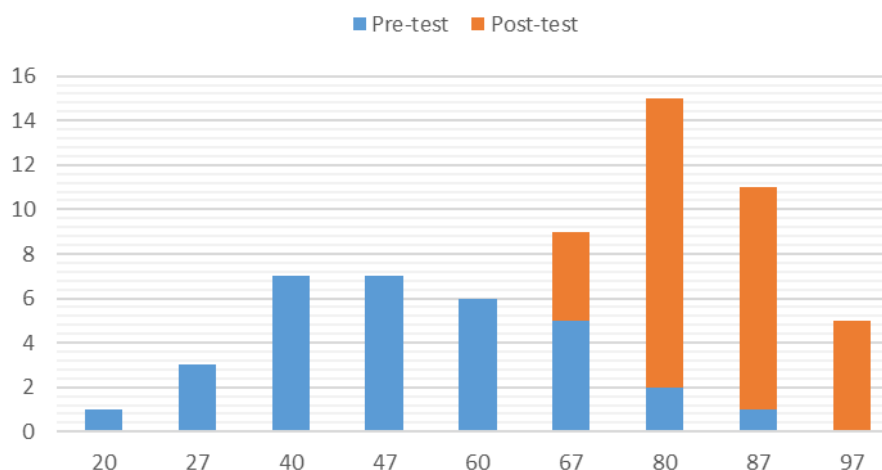


Figure 1. Histogram of Pre-test and Post-test Values.

The results of the student's pretest-posttest were then analyzed using in equation (1). The level of achievement of the pre-test obtained was 52% and the level of achievement of the post-test obtained was 81%. This can be seen from the student learning outcomes before using the web-based learning media (pre-test) to increase in values after using web-based learning media (post-test).

3.3. Analysis of differences in pre-test and post-test result

The results of the pre-test and post-test data were analyzed using the paired sample t-test formula. This analysis was used to determine the effect significantly between the results of the pre-test and post-test. Before the t-test analysis is carried out, the analysis of the requirements test is done namely the analysis of normality to see whether the data is normal or not. The results of the analysis of the normality test for the pre-test and post-test data are presented in table 1.

Table 1. Analysis Results of Normality Test Data Pre-test and Post-test.

Number	Group	N	Lcount	Ltable	Comparison	Information
1	Pre-test	32	-0,0039	0,156	Lcount<Ltable	Normal
2	Post-test	32	-0,219	0,156	Lcount<Ltable	Normal

Based on normality testing in table 1, obtained Lcount for pre-test of -0,00039 with Ltable value is 0,156 and for post-test is -0,219 with Ltable value is 0,156. Because the result is Lcount<Ltable, the sample is said to be normally distributed. This shows the prerequisites for testing hypotheses that have been fulfilled. After the pretest and posttest data have been declared normally, the hypothesis is tested by paired t-test analysis. The results of paired t-test analysis are presented in table 2.

Table 2. Paired t-test Analysis Results.

Number	Group	N	t _{count}	t _{table}	Comparison	Information
1	Pre-test	32	0,368	2,039	T _{count} < T _{table}	The hypothesis is accepted
2	Post-test	32				

Based on the tests carried out in table 2, a significance value of 0.368 with a value of 2.039 was obtained. This means that there is a significant effect on student learning outcomes between before and after using web-based learning media, thus web-based learning media influence the improvement of learning outcomes. Web-based learning media can make it easier for students to learn wherever and whenever both independently or guided by teachers online. By using this web-based learning media student can easily learn the learning materials that are equipped with various learning facilities including, means of discussion, quizzes, and online examinations.

4. Conclusion

The use of web-based learning media in the learning process makes it easier for students to understand the subject matter, so that learning outcomes increase. Based on research conducted in the state vocational high school 1 Painan for computer courses and basic network showed that of 32 students who took the tests before students use the web-based learning media have mastery learning achievement level of 52%. After using web-based learning media 32 students had a learning achievement level of 81%. Whereas in seeing how much significant influence on student learning outcomes between before and after using web-based learning media, a significance value of 0.368 was obtained.

5. References

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