

Comparison of Learning Media e-learning and Mobile learning on Basic Network Material in terms of the Response of Vocational High School Students in Bangkalan Madura

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Abstract — The development of information and communication technology gave birth to innovations in the field of education with the presence of digital communication, one of which is marked by the media of electronic learning (e-learning) and mobile learning. In vocational high schools, students are allowed to carry cellphones, but they are not used as a learning medium. Therefore, with the development of e-learning and mobile learning media, this study has the aim of:

(1) Knowing the comparison of e-learning and mobile learning media on basic network material in terms of the responses of vocational high school students in Madura Bangkalan; (2) describe the level of effectiveness, efficiency, and attractiveness of mobile learning media compared to the percentage of e-learning media. This study uses a quantitative descriptive approach, with the design of the Randomize Posttest-Only Control Design Group. The research instrument used is a questionnaire response. Questionnaire responses of students in this study were questionnaires containing related statements: (1) Effectiveness, (2) Efficiency, and (3) Attractiveness of learning media. Because the data is not normally distributed, the hypothesis testing of this study uses the Mann Whitney test. This study provides the results that: (a) there is a significant difference between the responses of students in the e-learning group and the mobile learning group; (b) The percentage level of effectiveness, efficiency, and attractiveness of mobile learning media is higher than the percentage of e-learning media.

Keywords: Learning Media, e-learning, Mobile learning, Student Response

I. INTRODUCTION (HEADING 1)

Education is a conscious, planned and endeavored effort to enable students to actively develop all potentials within themselves, namely to develop the potential of the mind (mental - intellectual), social, emotional, moral values, spiritual, economic (life skills), physical, and cultural (Supriadi et al., 2013: 1). Education is one important factor in improving the quality of individuals,

both through the learning process in formal, in-formal and non-formal schools. The process of implementing learning so that it runs well needs to be supported by several factors, including: the quality of the teacher, the use of instructional media, the availability of infrastructure, and so on.

Learning media is one factor that is very supportive in the learning and teaching process. Many technological developments that can support in the world of education. This is also reinforced by the opinion of Smaldino, et al (2011: 14) which states that "technology and media can play a lot in learning. If the teaching is centered on the teacher, then technology and media are used to support the presentation of teaching. On the other hand, if teaching is student-centered, students are the main users of technology and media." Along with the development of information and communication technology gave birth to innovations in education in the presence of digital communication. One of the developments in information and communication technology in education is the presence of electronic learning (e-learning) and mobile learning media.

An interview with one of the teachers at SMKN 1 Arosbaya, gave the result that there were some difficulties in choosing learning media that were practical and easy to use, for example, media for online examinations, assignments online. Observations at SMKN 1 Labang give the result that the majority of class X students majoring in computer and network engineering (TKJ)

have android-based mobile phones, which can be used as a medium of learning. But the majority, this handphone is not maximally used as a learning medium. Referring to the needs in learning in the Computer and Network Engineering (TKJ) Vocational High School major, web-based e-learning learning media and Android-based mobile learning for Basic Networking subjects in class X Department of Computer and Network Engineering (TKJ).

According to Behera in Muhammad Trio M.P. (2018), Mobile learning is learning that uses portable computing hardware such as smartphones. The use of mobile learning in basic network subjects, it is hoped that students will more easily understand the material of computer networks, various networks, and computer network videos.

Rusman (2010: 335) defines e-learning as a web-based technology application in the world of learning to help the educational process. Rosenberg in Rusman (2010: 346) emphasizes that e-learning refers to the use of internet technology to deliver a series of solutions that can enhance knowledge and skills. Asep Herman in Hartanto (2016: 1) states that the use of the internet and other electronic devices in learning e-learning enables learning to be done in the same or different times. however, e-learning has disadvantages that require users to deal with electronic devices that are not flexible to move (such as DVD Player, TV, or Personal Computer).

Based on these things, the objectives of this study are:

a) to find out the comparison of learning media e-learning and mobile learning on basic network material in terms of the responses of vocational high school students in Bangkalan Madura.

b) to describe the level of effectiveness, efficiency, and attractiveness of mobile learning media compared to the percentage of e-learning media.

After knowing the students' responses, the teacher is expected to know which ones are more interested in students in the use of instructional media for basic network lessons. Learning media that will be used in this study are e-learning media that have been developed by Ali Makki (2019) and mobile learning media that have been developed by Dwi Rohmatul Maulidah (2019) .provided. The formatter will need to create these components, incorporating the applicable criteria that follow.

II. RESEARCH METHODS

This study is comparative research with a quantitative descriptive approach. This study is a comparative study because in this study will be compared to the responses of students who use e-learning media and the responses of students who have used mobile learning media. Because the data that will be obtained, processed, and presented are quantitative, this research uses a quantitative descriptive approach. The population used in this study were class X students majoring in computer and network engineering (TKJ) SMKN 1 Labang and SMKN 1 Arosbaya Bangkalan. In this study, there were two groups as samples whose members were chosen randomly.

The design of this study uses a design form that is Randomize Posttes-Only Control Design Group which is presented in Figure 1 below.

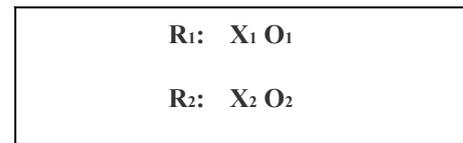


Figure 1. Randomize Posttes-Only Control Grup

Desain Information:

R1: groups that use e-learning media

R2: groups that use mobile learning media

X1: treatment by applying e-learning media

X2: treatment by applying mobile learning media

The independent variables (independent) in this study are e-learning media and mobile learning media. While the dependent variable (dependent variable) of this study is student response. A first group is a group that uses e-learning media (as many as 20 students), while the second group is a group that uses mobile learning media (as many as 21 students). Student selection as a sample is taken randomly.

Data collection techniques in this study using a questionnaire technique. The instrument used to obtain data is called a response questionnaire. The student response questionnaire developed in this study is a questionnaire containing statements, which contained several indicators. Indicators on the student response questionnaire consisted of (1) Effectiveness, (2) Efficiency, and (3) Attractiveness of the learning media used. According to Mardiasmo in Hermawan (2013: 10) states that effectively describes the level of achievement of program results with the targets set. with other languages that effectiveness is the achievement or success of a goal with a set plan. According to Mulyadi in Nugroho (2017: 24), states that Efficient is the accuracy of the way (business, work) in doing something without wasting time, effort and cost. While the attractiveness of learning media in this study is related to everything that can attract (attract) the attention of users of the learning media.

Student response data that has been obtained, will be processed and analyzed using the help of the PASW (Predictive Analytics SoftWare) Statistics program. To find out the difference between student responses using e-learning and mobile learning, the data will be analyzed using the PASW program with an independent t-test.

III. RESEARCH RESULT

A. Data Description

The data collected in this study include student questionnaire response data after using e-learning media and mobile learning media. A group of students consist of 20 students who used e-learning media was 20 students, while groups of students who used mobile learning were 21 students.

B. Student response data using e-learning media

This data was obtained through a learning response questionnaire of 10 statements. To find out the distribution of student responses when using e-learning learning media is summarized in table 1 (Table 1). Distribution of student responses using e-learning.

No	Score	Frequency	Percentage
1	38	2	10 %
2	39	1	5%
3	40	3	15%
4	41	9	45%
5	42	5	25%
Total		20	100%

Data on the ability of students' questionnaire responses in using e-learning in detail is presented in the histogram in Figure 2 below

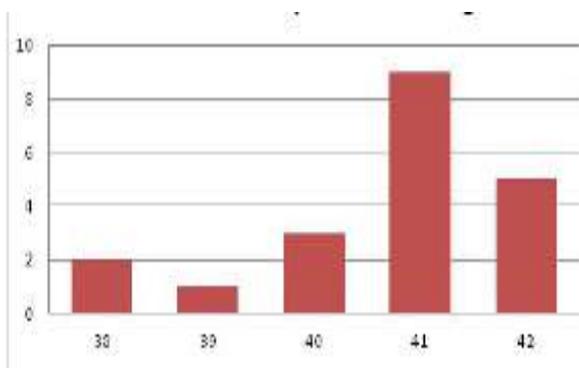


Figure 2 . Histogram of student responses using e-learning.

In Table 1 and Figure 2 it appears that the student response data after using e-learning has the highest frequency with 9 students on a score of 41. The lowest frequency of 1 student on a score of 39.

C. Student response data using mobile learning

This data was obtained through a questionnaire response of 10 statements. To determine the distribution of student responses when using mobile learning media is summarized in table 2

Table 2. Distribution of student responses using mobile learning

No	Score	Frequency	Percentage
1	42	2	10 %
2	43	4	19%
3	44	6	29%
4	45	6	29%
5	46	2	10%
6	47	0	0%
7	48	1	5%
Total		21	100%

Data on the ability of students' questionnaire responses in using mobile learning in detail is presented in the histogram in Figure 3 below.

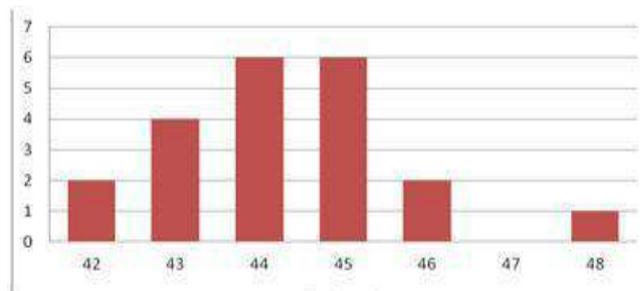


Figure 3 Histogram of student responses using mobile learning.

In Table 2 and Figure 3, it appears that the frequency of the questionnaire response data using the most frequent mobile learning frequencies with the number of 6 students lies in scores of 44 and 45. The lowest frequency is 0 students with a score of 47

D. Data comparison of response data between e-learning groups and mobile learning groups

The description of comparative data on the use of e-learning and mobile learning is described in Table 3.

Table 3. Comparison of students' responses between the two groups after using e-learning and mobile learning media

Group	Total Data	Max.	Min.	Average	Standard Deviation
E-learning	20	42	38	40,70	1,2
Mobile learning	21	48	42	44,29	1,4

Table 3 shows a comparison of student response data after using e-learning media and mobile learning. The highest score of student responses after using e-learning is 42 and the lowest score is 38. The average score of responses of students in the e-learning group is 40.70 with a standard deviation of 1.2. While the mobile learning group had the highest score of 48 responses while the lowest score was 42. The average score of the mobile learning group questionnaire was 44.29 with a standard deviation of 1.4. This shows that the average value of the response of the mobile learning group is better than the e-learning group.

E. Hypothesis test

Before testing the hypothesis, the researcher first tests the normality of the data that has been collected. Based on the normality test of e-learning using PASW student response data obtained Kolmogorov-Smirnov value of 0.000 is greater than the significance of 0.05 with data not normally distributed. While the results of the normality test on student response data using mobile learning obtained Kolmogorov-Smirnov value of 0.142 with greater than 0.05 normally distributed data. The homogeneity test results data of the two student response data using e-learning with mobile learning amounted to 0.518 greater than 0.05 homogeneous data.

Non-fulfillment of the normality assumption test is to find out the difference between students' responses using e-learning and mobile learning using non-

parametric tests. The non-parametric test uses the PASW program with the type of Mann Whitney test to test whether there are differences in student responses between e-learning and mobile learning.

The results of the research hypothesis test using the Mann Whitney test obtained a significant difference of 0.00 or smaller than 0.05. These results indicate that there are significant differences between student responses between e-learning and mobile learning.

This difference is supported by the comprehensive means test with an average use of e-learning media of 40.70 while using mobile media with an average of 44.29. This means that it is concluded that the response of students who use mobile learning is greater than e-learning.

The percentage difference in student responses between groups using e-learning media and groups using mobile learning media is presented in Figure 4

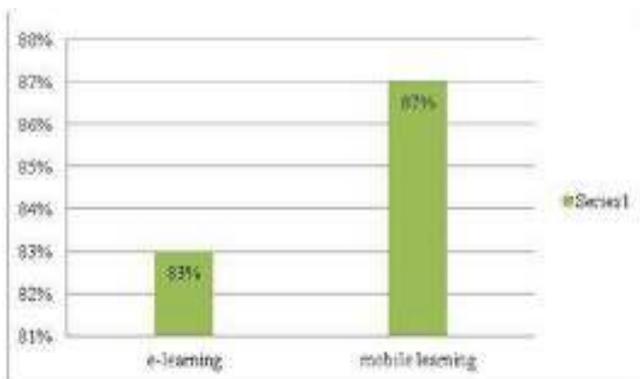


Figure 4 Comparison of the percentage of e-learning group responses with mobile learning groups

In detail, the comparison of student responses between e-learning groups and mobile learning in terms of effectiveness indicators is presented in Figure 5

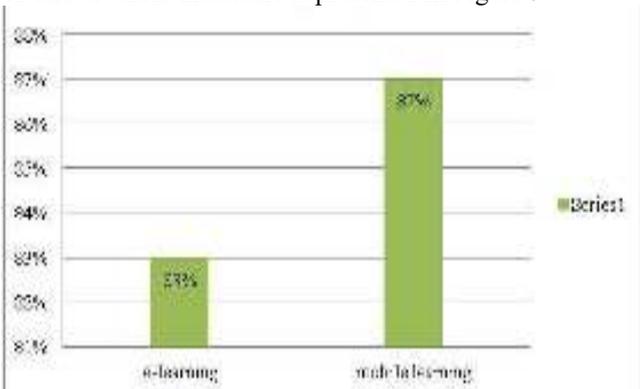


Figure 5. Comparison of the effectiveness percentage of e-learning and mobile learning media

Comparison of student responses between e-learning groups and mobile learning in terms of efficiency indicators, presented in Figure 6

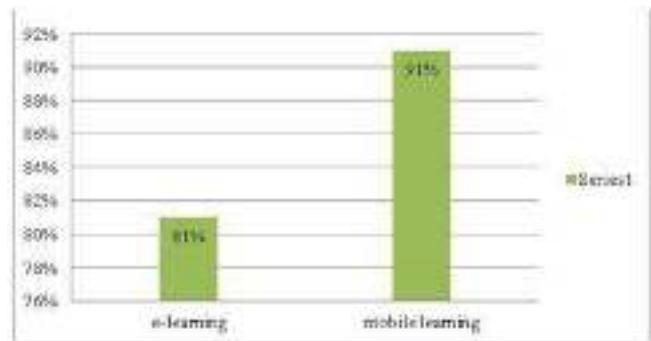


Figure 6 The difference in the percentage of e-learning efficiency with mobile learning

Comparison of the results of student responses between e-learning groups with mobile learning in terms of the attractiveness indicator is presented in Figure 7

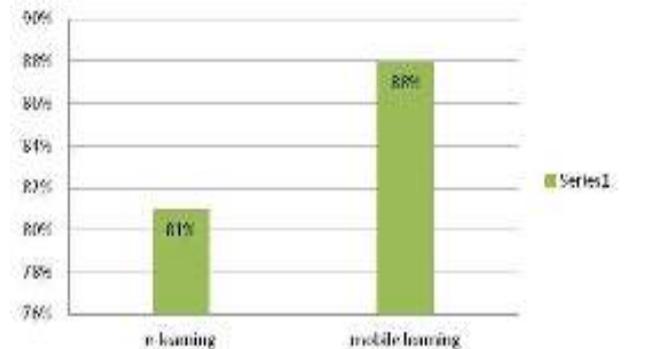


Figure 7. Comparison of the attractiveness percentage of e-learning and mobile learning media

The difference between e-learning and mobile learning is characterized by better mobile learning as described in Figure 4. Figure 4 shows that overall, the percentage of responses to the mobile learning group has a percentage rate of 87% which is higher than the percentage of e-learning group responses of 83%. Referring to the percentage of students' responses in Figure 5, the effectiveness of mobile learning media has a percentage level of 87% which is higher than the percentage of e-learning media which is 83%. Referring to the percentage of student responses in Figure 6, the efficiency aspect of mobile media has a percentage level of 91% which is higher than the percentage of e-learning media by 81%. While in terms of attractiveness, mobile learning media has a percentage rate of 88% which is higher than the percentage of e-learning media by 81%.

This study provides results that the use of mobile learning media has a higher response rate than e-learning media. This is in line with research by Barakati (2013) which revealed that the use of mobile learning with smartphones can be easier, faster, practical, effective and enjoyable when learning English.

IV. CONCLUSION

This research concludes that:

1. Referring to the results of the Mann Whitney hypothesis test, it was found that there was a significant difference between the responses of students in the e-learning group and the mobile learning group. This is also reinforced by the data of the means comparison test results, that the average response of the e-learning media

group was 40.70 while the average response of the group of mobile learning media users was an average of 44.29.

This gives the conclusion that there are differences in student responses between e-learning and mobile learning groups, with the level of student response in the mobile learning group greater than the e-learning group.

2. The percentage level of effectiveness, efficiency, and attractiveness of mobile learning media is higher than the percentage of e-learning media.

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