The Effect of Mobile-Learning Models on Students' Learning Outcomes of Research Methodology Courses at the Cosmetology and Beauty Department

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***Abstract*— This study identified learning outcomes for students using Android-based mobile learning models as compared to student learning outcomes using conventional learning models. It determined how much influence the Android-based mobile learning model has on student learning outcomes at the Makeup and Cosmetology Department Research Methodology course. This study used a quasi-experimental design method with a non-equivalent control group design. The population was makeup and beauty students who took research methodology courses in the July-December 2019 semester, totaling 94 students consisting of 3 classes. The sampling technique used in this study was cluster sampling from 3 classes; two classes were taken randomly. From the two classes, there was an experimental group for 30 students and as a control group for 31 students. The experimental class applied the Android-based mobile learning model of learning media, and the control class applied the conventional learning model. Research data collection used tests and documentation. The data collected were pretest and posttest data. The techniques of data analysis used quantitative descriptive. The hypothesis testing method used was the t-test analysis. The results showed that two crucial points. First, the calculation of scores on student learning outcomes has an increase in classes that applied an Android-based learning model. Second, the t-test results showed this study succeeded in applying the Android-based learning model to affect learning outcomes and effectively improve student learning outcomes in research methodology courses in the Department of Make-Up and Cosmetology**

Keywords—Mobile learning, android-based learning model, learning outcomes

I. INTRODUCTION

Education has a significant role in determining the progress of a nation, therefore improving the quality of education needs to be carried out sustainably. The education quality can be improved in various ways, one of which is through the learning process. The dynamic learning process is adapted to changes in society and advances in science and technology, where the role of the lecturer is very decisive in the quality learning process.

Learning 4.0 is an industry 4.0 response where people and technology are aligned to allow for new possibilities. Peers are esteemed in learning 4.0. Students learn together while the lecturer takes the role of facilitator in learning. Lecturers as facilitators must be able to increase student interest in teaching material, and students in learning become a learning center (Student-Centered Learning).

Educational changes create innovations in education intending to improve the quality of education. Information technology, like innovation, is a necessity for education. Using multimedia applications in learning will be more fun, innovative, and creative. The more goal-oriented learning process can be achieved with multimedia usage. Besides, it can also be more participatory, time, and space flexible. It could be less troubled by location and adapted to student learning styles, and collaboration among teachers and students could increase. Multimedia also lets users learn to be fun and friendly, without worries about incompetence. Enhancing the quality of learning is helped by the functions of supporting technology in teaching, educators. The features of mobile devices that have a high degree of flexibility and portability enable students to access learning materials, directions, and information anywhere and at any time [1]. The mobile device, which is currently experiencing a very rapid development trend, is Android. Android is a current technology that is well known to the public, students, students, and adults, but it is still of little use for learning. Nature that is easy to carry everywhere, and in general, everyone has.

Mobile-learning is a learning model that is carried out between places or environments using technology that is easy to carry when learning by carrying a mobile phone with various features and applications. According to Yuliani [2], mobile learning (m-learning) is a learning model that adopts technological developments, cellular and HP devices

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(handphone), where this technology can be used as a learning medium. M-learning means learning; this is delivered anytime and anywhere through the media use of the internet and mobile devices. The media included mobile phones, personal digital assistants (PDAs), smartphones, and digital audio players [3]. This mobile-based learning is an existing application. According to Alifzal [4], through this feature (mobile), students can access all knowledge information. The advancement of this feature has provided many benefits for human life; in particular, it is also beneficial for the world of education, especially in the learning process, both in the learning planning process, learning management, and learning assessment. M-Learning allows students to carry out activities in the form of learning materials, directions, and learning information every time and everywhere. It is also able to overcome the limitations of time allocation for specific materials. Besides, it leads students to learn by themselves through materials and sources provided[5].

Based on observations made on UNP tourism and hospitality faculty students, the number of Android users is approximately 90%. The high number of android users on campus by students can make Android an effective learning medium for students to carry out independent learning anywhere and anytime. The use of learning media, especially in the research methodology course at the Faculty of Tourism and Hospitality, UNP is currently still using books, learning modules. Students feel monotonous using textbooks/modules. Based on the learning outcomes obtained in the research methodology course in the July-December 2018 semester, the number of students was 283 consisting of 80 people from the Department of Make-up and Beauty and 203 from the Tourism Department. The value obtained varies from the lowest E to the highest value (A). There are still students who score C-, D, and E (8%), B, and B + (8%).

This study was (1) to assess the learning outcomes of students who use mobile learning models, and has (2) the effect of the use of mobile learning based learning to increase students' learning outcomes in the subject of the research methodology.

II. RESEARCH METHOD

This research was the research of R and D (Research and Development) with a 4-D development model, namely define, design, develop, and disseminate. Based on the detailed flow of the 4D development research stages in Figure 1, the 4-D model was chosen in this study because the development model has a systematic procedure, following the problems underlying this research.

The research was conducted at the Department of Beauty and Cosmetology, Faculty of Tourism and Hospitality, Universitas Negeri Padang (FPP UNP), in the semester of July-December 2019. The population in this study was makeup and beauty students taking research methodology courses in the semester of July-December 2019, totaling 94 students consisting of 3 classes. The sample used in this study was cluster sampling from 3 classes; two classes were taken randomly. From the two classes, one class was used as an experimental group (31 students), and one class was used as a control group (30 students). The experimental class applied the model learning media mobile learning Android-based, and the control class applied the learning model conventional.

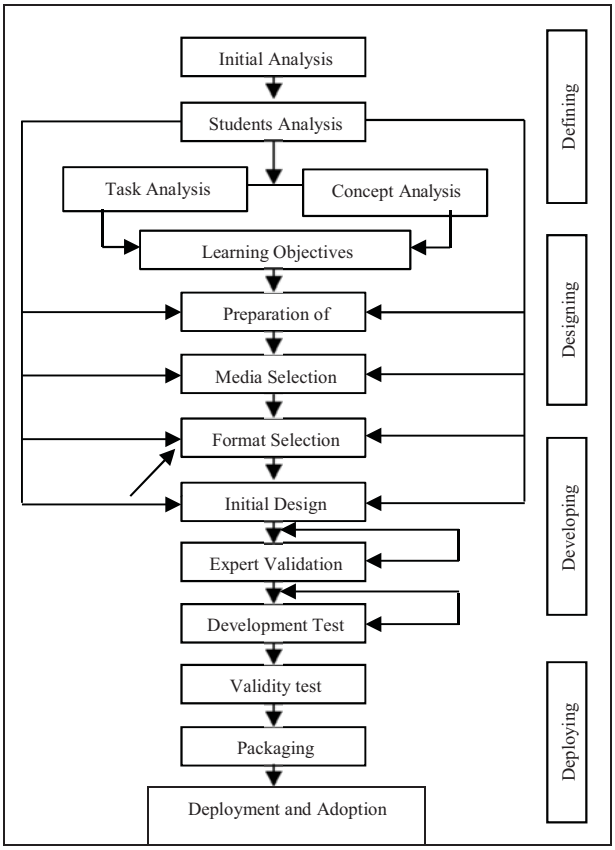

Fig. 1. Development Model by Thiagarajan, S., et al. [6]

TABLE I. RESEARCH DESIGN PRETEST-POSTTEST CONTROL GROUP DESIGN

Classes	Pretest	Treat	Posttest
Experiment Class	O1	X1	O2
Controls Class	O3	X2	O4

Description:
O1: Pretest marks of Experiments class
O3: Pretest marks of the pretest control class
O2: Posttest marks of experimental class
O4: Posttest marks of the control class
X1: Application of instructional media based on Android and PowerPoint
X2: Application of only media powerPoint (Conventional)

This research data collection used tests and documentation. The data collected were pretest and posttest data on the learning outcomes of the methodology research before they carried out the treatment, and accordingly, the treatment was carried out. The techniques of data analysis used were quantitative descriptive. Hypothesis testing was used as a t-test analysis. The research design used a pretest-posttest control group design [7], as in Table 1.

As for identifying the calculation of effectiveness for comparing the pretest to posttest using the formula gain score as equation (1)

$$N-gain=\frac{score\ of\ posttest-tess\ scores\ prior\ knowledge}{Maximum\ score-score\ ability\ test\ early} \quad (1)$$

Description:

N-Gain: Gain normalized
Pretest: The initial value of learning
Posttest: The final value of learning

It was analyzed using the independent-sample t-test to determine whether there is an increase in learning outcomes between the experimental group and the control group. The prerequisite test to be met is the normality test and the data homogeneity test. The statistical test was carried out using the window program SPSS with a 95 percent confidence level. The proposed hypothesis was:

Ha: There is a significant difference between the experimental class and the control class in the research methodology course in improving the student learning outcomes

H0: There is no significant difference in student learning outcomes in the subject-research methodology between the experimental class and the control class.

III. RESEARCH RESULTS AND DISCUSSION

The result of the display design is the design of the mobile learning application interface for the research methodology course that has been designed. Interface design is a display of the system seen by the user or user. The results of the menu display design on the Android application can be seen in Fig.2

The design of the display of this android application is made as attractive as possible with a splash screen display containing the name and logo, then there is a syllabus page, which is a one-semester learning plan, a material page designed with a structured learning model. This page consists of five menus, each of which is divided into sub- menus: RPP for each meeting, material per meeting, video, and evaluation menu. So that students are interested and motivated to open and read it. This application can be seen and read anytime, anywhere

Student learning outcomes in the research methodology course were measured by conducting tests before and after learning. Lecture material in research is taking material about research problems, theoretical frameworks, and hypotheses. Before the learning process, students are given exam questions about the material research problems, theoretical studies, and hypotheses to determine students' initial learning outcomes (pretest). Besides, the students were offered the same questions during the pretest at the end of the learning process. The data used were standardized gain (increase) data of pre and post-learning outcomes of the students. Table II represents the typical increase in the learning outcomes of the experimental class and the control class. Table II indicates that the experimental class shows a more substantial average increase of 0.52 compared with the 0.2

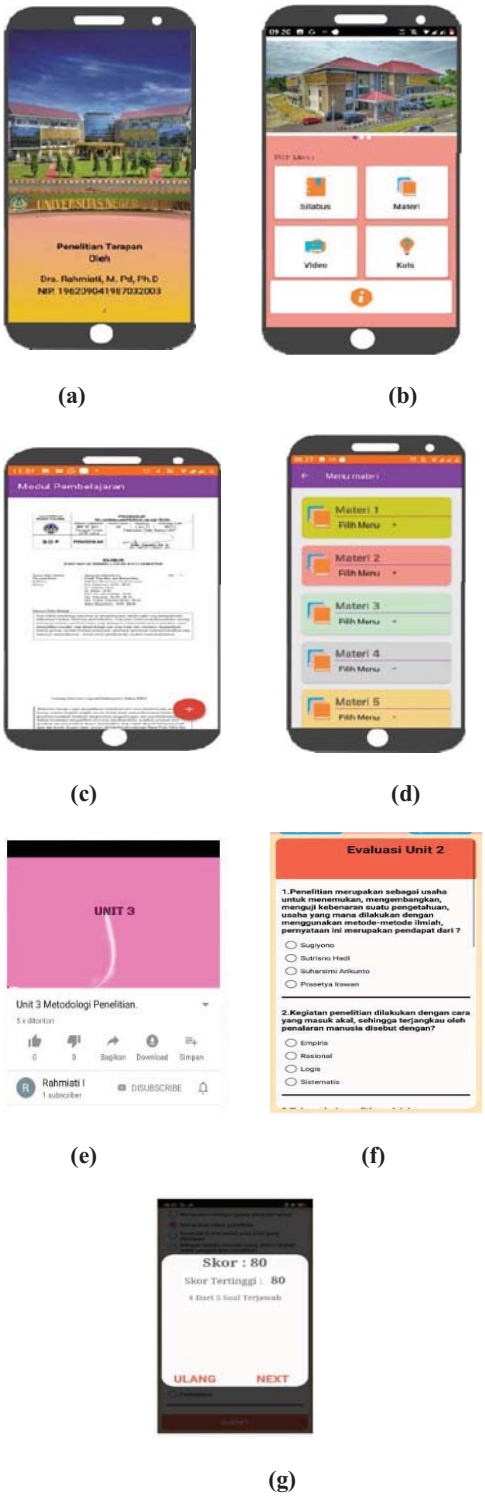

Fig. 2. (a) Splash screen display, (b) home display, (c) syllabus menu display, (d) material menu display, (e) Viveo menu display, (f) evaluation display, (g) score display

TABLE II. THE CALCULATION RESULTS OF AVERAGE STUDENT LEARNING OUTCOMES

Class	Number of students	Average Pretest	Average Post-test	Gain
Experiment	30	62, 20	82	0.52
Control	31	62.29	69.84	0.2

TABLE III. NORMALITY TEST DATA

Class	Shapiro-Wilk			Conclusion
	Statistical	df	Sig.	
Experiment-pretest	.943	30	.107	Normal
Experiment- posttest	.934	30	.065	Normal
Control-Pretest	.961	31	.302	Normal
Control-posttest	.964	31	.372	Normal

TABLE IV. HOMOGENEITY DATA

Test Data	Sig	Conclusion
Levene Statistic of Pretest	.338	Homogeneous
Levene Statistic of Posttest	.356	Homogeneous

control class. Then the Android-based research methodology learning model is declared effective for students of the Department of Makeup and Cosmetology, FPP UNP. However, it was necessary to find out if there is a significant difference between the experimental class and the control class and independent-sample t-test. Before testing the hypothesis, it was necessary to test the prerequisite analysis, namely the normality test and the homogeneity test. The normality test used was the statistical Shapiro Wilk test. The results of the normality test became a basis for determining the type of mean difference test used. The results of the normality test are represented in Table III.

Based on Table 3. Given the significant value (Sig.) Normality test pretest group The experimental value is 0.943, which means that the sig value ≥ α is 0.943> 0.05 so that Ho is accepted, and in the group it controls is 0.961, which means that the sig value ≥ α is 0.961> 0.05 so that Ho is accepted. Meanwhile, the normality test posttest in the experimental group was 0.934, meaning that the sig value was ≥ 0.05 so that Ho was accepted, and in the control class, it was 0.964, which meant that the sig value ≥ α was 0.964> 0.05 so that Ho was accepted. It can be concluded that the pretest and posttest in the experimental group and the group control are normally distributed

The homogeneity test was carried out to decide the average difference test used after the normality test, and the data were normally distributed. The homogeneity test was conducted to see whether or not the pretest data variance of student learning outcomes was homogenous in the experimental class and control class. The homogeneity test used was the test Levene with a significance level of α=0.05. The result of the pretest and posttest homogeneity test data of student learning outcomes of the experimental and control class can be seen in Table 4 below.

Based on the results of the data homogeneity test, the pretest results in table 4 obtained the sig value. It is 0.338 means that the value of Sig ≥ α is 0.338 ≥ 0.05 so that Ho is accepted. It means that the pretest data variance of student learning outcomes in the experimental class and the control class is homogeneous. Meanwhile, for the data homogeneity test, the results posttest obtained the Sig, which is 0.356 means that the value of Sig ≥ 0.05 so that Ho is accepted. It means that the posttest data variance of student learning outcomes in the experimental class and the control class is homogeneous.

The results of hypothesis testing using the Independent-Sample T-test show that the t-test results can be known as the 0.000 sig (Sig. < 0.05) value. It indicates that there is a significant difference in both classes in improving student learning outcomes, where the experimental class shows better improvement than the control group.

These results can be concluded that the Android-based mobile learning model applied to the research methodology course for students has an influence on student learning outcomes and effectively and efficiently improves student learning outcomes. The increase in student learning outcomes is because the android application is designed interactively to make students interested in reading and studying it anywhere and anytime. On the home screen display, the page is built with a structured task learning model oriented to the goals to be achieved. The material presented is well packaged and is also equipped with structured assignments and quizzes that must be done by students every week. On the quiz menu, students answered, and the score immediately came out. The application is also equipped with learning videos that are linked to YouTube, namely materials. With the menus provided in the android application so that students can learn independently from the various sources provided

In line with the results of research conducted by Indra Setyawati [9], it shows that learning media based on android sensing systems on learning outcomes can effectively improve student learning outcomes in class XI SMANegeri 2 Bantul. According to Sujana and Rivai [10], learning media can help the learning process of students in learning and is expected to increase the achievement of student learning outcomes. The use of learning media based on Android applications has a positive influence on the learning process. It shows with questionnaire results data of 80.05%, which are in the good category and get a positive response during the learning process [11]. Results from[12] research also revealed that implementing Android-based teaching materials was sufficiently significant to improve student learning outcomes by 63%. Mobile learning also has implemented in [13]-[16]

The implementation of the mobile learning model based on Android strongly supports student-centered learning and encourages students to study independently and collaborate with classmates. Learning is not only in a particular place or room, but they can do it anywhere and anytime. Android, which is owned by students, is not only used to view sites that are less useful but can be used for learning.

IV. CONCLUSIONS AND RECOMMENDATIONS

A. *Conclusion*

1. Android-based mobile learning models are effective in improving student learning outcomes in the course Methodology Research of the Department of Makeup and Cosmetology, FPP UNP.
2. The Android-based mobile learning model has a significant effect on student learning outcomes in the

Research Methodology course, Department of Administration. Make-up and Beauty FPP UNP.

B. *Suggestions*

As for optimizing learning outcomes, some suggestions are made:

1. It is necessary to develop similar media with different materials or courses.
2. In using this learning model, lecturers need to motivate students to learn independently in using this media.
3. Further research is needed; mobile learning media can be developed to produce more perfect learning media.

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