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Development of Laboratory Skills Application Based on Android as a Media of Flipped Learning Model for Nursing Student

Basok Buhari *, Rian Maylina Sari

Faculty of Nursing, Sekolah Tinggi Ilmu Kesehatan Harapan Ibu Jambi, Jambi 36122, Indonesia

**Corresponding Author's Email: basokbukhari01@gmail.com*

ABSTRACT

The development of the current era is closely related to the increase in digitalization. The impact of the development of digitalization as a whole has a positive effect on the field of education. Online learning through the use of digitalization changes learning models that tend to be passive to active through the management of learning models in the classroom or laboratory based on digital media. The research design was development method (Research and Development) which was adapted from the 4D model (Four D Model) which consists of four stages, namely: define, design, development, and dissemination. The data type of this research is quantitative data. Quantitative data is obtained through scoring from experts and nursing student as user. This research is based on quantitative data. This research was conducted at Nursing Study Program, Sekolah Tinggi Ilmu Kesehatan Harapan Ibu Jambi, Jambi Province, Indonesia. The results of media experts that overall learning applications with a percentage 96.25%. These percentage can be interpreted as application of dissemination media and is very decent to use. The results by design experts, overall learning application get a percentage 85.2%. These percentage can be interpreted as application of dissemination media is very decent to use. The results of the attractiveness test show that nursing student respond very well to the use of Android as a learning media for flipped learning models. Nursing student consider the packaging of material in the form of material, procedural, learning videos and article, as well as the interactive and ease of use of these media to make material about skills laboratory is more interesting to study.

Keywords: Skills Laboratory; Learning Application; Flipped Learning

INTRODUCTION

The development of the current era is closely related to the increase in digitalization, utilization which offers enormous benefits for the entire community to get access to the information needed without being limited by space and time. The impact of the development of digitalization as a whole has a positive effect on the field of education, especially teaching to students (Xu Du, *et al.*, 2022).

Online learning through the use of digitalization changes learning models that tend to be passive to active through the management of learning models in the classroom or laboratory based on digital media, so that students are more active in accessing learning resources from videos whenever and wherever necessary (Tohari *et al.*, 2019). These materials can be easily re-learning through online video access according to the information needed. There are many learning models that can manage the class to be more active, one of which is flipped learning models (Dwiningsih, *et al.*, 2018).

Development of learning applications for flipped learning models was based on the android platform using the basic algorithm on android studio. The design of the learning model on the android application was chosen because the use of technology, especially gadgets, was increasing. According to Reidsema *et al.*, (2017) on flipped learning models, it is necessary to actively involve students in accessing relevant online learning videos during class meetings (Zainuddin, & Perera, 2018).

The achievement of student skills in the era of the 4.0 revolution is already based on big data that is easily accessible using Android. The research aims to develop an android-based laboratory skills application for nursing students.

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METHODOLOGY

Research Design

The research design was developed based on the method (Research and Development) which was adapted from the 4D model (Four D Model) which consists of four stages, namely: define, design, development, and dissemination. The product that will be produced in this research was the development laboratory skills application based on android as media flipped learning models for nursing student. The process of this research is as follows; the first stage is define, analyze the needs of laboratory skills application.

The second stage is design, in this stage an attractive display design starts on the laboratory skill aplication, where the most important thing to consider is the background display, layout, font, size, font color display menu and navigator, as well as the video display supporting media for flipped learning models. The third stage is development, the stage taken in developing the initial product are as follows. Material formulation, videos formulation, making flowcharts and product storyboards, product development. Then, at this stage also taken in product validation expert is the validity test by media experts, practice experts and design experts. The next step is to revise the product and in small groups try out, as well as field trials. The fourth stage is dissemination, this stage is product of the development result.

Research Setting

This research was conducted at Nursing Study Program, Sekolah Tinggi Ilmu Kesehatan Harapan Ibu Jambi, Jambi Province, Indonesia.

Research Subject and Object

Research subjects are media experts, practice experts, design experts and nursing student of Sekolah Tinggi Ilmu Kesehatan Harapan Ibu Jambi. The object of this research is application of laboratory skills. The research time is done in stages starting from August until September 2021. An experimental test was conducted on 40 Nursing student. A variable instrument should meet two requirements that are valid and reliable. The test was conducted by non-test in the form of questionnaire for nursing student opinion on the feasibility of laboratory skills application as supporting media for flipped learning model. Validity test is done by expert judgment by 2 media experts, 2 practice experts and 2 design experts. Questionnaire items which have been prepared will be analyzed and evaluated by the experts.

Instrument and Data Collection Technique

Technique used to collect data in this study were interviews, observation, and questionnaires. Interviews and observations are used at the communication stage to get an idea of what products will be made. The instrument used in this study is derived from Usability J.R Lewis comprises of 19 question (Lewis, 1994). This questionnaire consisted of 3 (three) factors; system usefulness (SYSUSE), information quality (INFOQUAL), and interface quality (INTERQUAL). Questionnaire is used to know the opinions of nursing student.

Data Analysis Technique

The data type of this research is quantitative data. Quantitative data is obtained from scores through experts and nursing student as user. Data analysis technique used in this research is descriptive analysis technique by altering the average score result data score interval. This analysis is used to describe the data characteristics of media expert, material expert and nursing students. The feasibility rating scores in the table below will be used as a reference to the results of trials by media experts, practice experts, design experts and nursing students. The results of the scores obtained from the questionnaire will show the feasibility of laboratory skills applications as a flipped learning media as shown in table 1.

Table 1: Guidelines for Assessment Criteria

Percentage (%)	Assessment Criteria
0-20	Very Unfeasible
21-40	Less Feasible
41- 60	Quite Decent
61-80	Feasible
81-100	Very Feasible

Ethical Consederation

Approval and permission to conduct the study was obtained from the ethical exemption with register number No.LB.02.06/2/178/2021 on 19 August, 2021. This research was declared to be ethically appropriate in accordance to 7 (seven) WHO 2011 standars.

RESULTS

The Result of Application

The result of application define consist of two stage

are content analysis and need analysis. The content analysis stage to identfy material based on learning outcome of Basic Nursing Subject for skills laboratory contained in the study planning. The selected skills laboratory material are intravenous installation, nasogastric tube installation, catheter insertion, intravenous injection, and oxygenation procedure. Whereas, the need analysis stage to develop learning media by utilizing current technological developments with designing material context features, standart procedure operational, learning videos for each material, and article for each material.

The Result of Application Design

The design stage was conducted by making the flowchart and storyboard. The purpose of the flowchart is to provide an explanation on each section or sub-section of the navigation or button on the application. The goal of the storyboard is to provide an explanation of the narrative path in the application (figure 1 and 2).

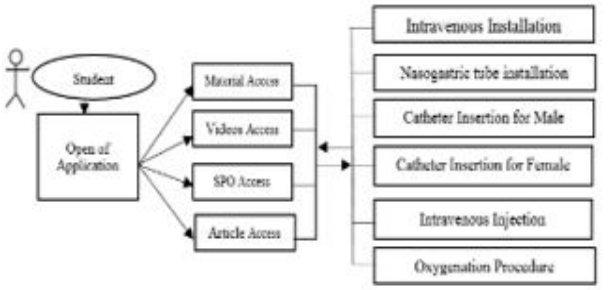

Figure 1: The Flowchart of Application

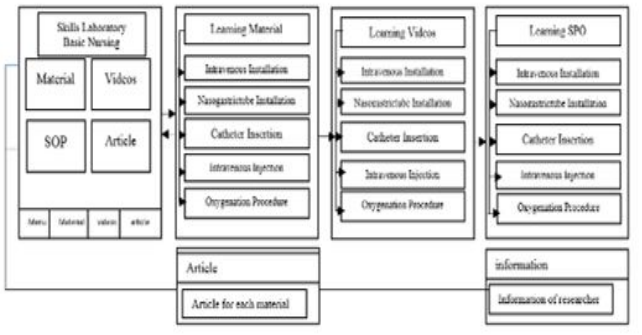

Figure 2: Storyboard of Application

Based on results of application design by realization of the flowchart and storyboard, the stage was created based on application used android studio software (figure 3).

Figure 3: Design of Android Studio

The Result of Application Development

The activity carried out at next stage is expert validation which aims to measure whether the developed application are appropriate to measure. The following is the display of the android application product in a format that has been downloaded on an android smartphone (figure 4).

Figure 4: Development of Android Application

The results of expert validation on the eligibility of android application can be seen in the data below. Validation of the feasibility of the application was assessed by media experts with 4 aspects, namely appearance criteria, user convenience, language, implementation and each criterion contained a statement with a total of 14 statements. The results of media experts can be seen in the table 2.

Table 2: The Assessment Results of Media Experts

Aspect Assesment	Media Experts (%)	Validity
Display Aspect	90%	Very Feasible
User Easy Aspect	95%	Very Feasible
Language Aspect	100%	Very Feasible
Implementation Aspect	100%	Very Feasible
Average	96.25%	Very Feasible

Based on table 2, explains the assesment results by media experts, Overall learning applications get a percentage 96.25%, which can be interpreted as application of dissemination media is very decent to use. The results of practice experts can be seen in the table 3.

Table 3: The Assessment Results of Practice Experts

Aspect Assesment	Practice Experts (%)	Validity
Application Layout	85%	Very Feasible
Menu	100%	Very Feasible
Content	77.5%	Feasible
Convinience	75%	Feasible
Expediency	100%	Very Feasible
Implementation	70%	Feasible
Average	84.6%	Very Feasible

Table 3, explains the assesment results by practice experts, overall learning application get a percentage 84.6%, these can be interpreted as application of dissemination media is very decent to use. The results of design experts can be seen in the table 4.

Table 4: The Assessment Results of Design Experts

Aspect Assesment	Design Experts (%)	Validity
Application Layout	85%	Very Feasible
Colouration	92.5%	Very Feasible
Picture	85%	Very Feasible
Letter	76.7%	Feasible
Menu	86.7%	Very Feasible
Average	85.2%	Very Feasible

Table 4 explains the assesment results by design experts, overall learning application get a percentage 85.2%, which can be interpreted as application of dissemination media is very decent to use.

The results of validation experts suggest that for the application in playstore to support flipped learning model. The result of final application development can be seen in figure 5.

Table 4 explains the assesment results by design experts, overall learning application get a percentage 85.2%, which can be interpreted as application of dissemination media is very decent to use.

The results of validation experts suggest that for the application in playstore to support flipped learning model. The result of final application development can be seen in figure 5

Figure 5: The Final Application Development

The Result of Application Dissemination

Based on the results of the user acceptance test (UAT) was one using the Usability Questionnaire J.R Lewis on nursing students. The results of the feasibility assessment by the user can be clearly seen in figure 6.

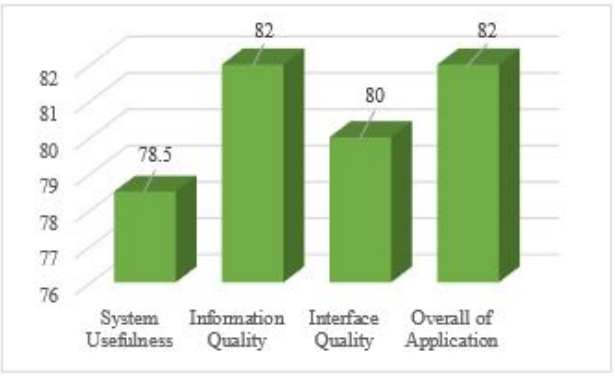

Figure 6:. The Results of Usability

The results of the nursing student as user assessment on the learning media obtain the average percentage 82% which means the application of learning media is suitable for use. Aspects of system usefulness showed a percentage of 78.5%, which means the application of learning media is decent to use. Aspects of information quality obtain average percentage of 82%, which means

the application of learning media is very feasible to use. Aspects of interface quality obtain average percentage of 80% which means the application of learning media is feasible to use. Overall learning media applications very well used by nursing student.

DISCUSSION

Based on the results of the attractiveness test, overall learning media applications are very well to be used by nursing student. The attractiveness includes aspects of the system usefulness, attractiveness of information quality, attractiveness of interface quality and attractiveness as a learning media to support flipped learning models.

The results of the attractiveness test show that nursing student respond very well to the use of Android as a learning media for flipped learning models. Nursing student consider the packaging of material in the form of material, procedural, learning videos and article, as well as the interactivity and ease of use of these media to make material about skills laboratory more interesting to study. This is in line with the research results Said *et al*., (2018) which conclude that media-based learning using android mobile learning is very feasible (76.67%). This is also in line with the results of research by Wahyudi, (2017) regarding the development of learning media using Android, it is known that the product trial assessment of students as a whole obtained an average percentage of 83% with the criteria as very good.

This research is also in line with research by Kusmaryani *et al.*, (2019), which concluded that mobile applications used as learning media were positively optimized. The development of media learning based on android as the flipped learning models can serve as one of the solutions to cope with the learning problems, both in terms of time limitations, media and broadcasting, and learning methods (Musahrain, 2016).

The impact of adopting an Android-based media learning for nursing student is to provide a digital environment in their learning media. Learning objectives can be achieved so as to make nursing student enthusiastic in ongoing learning as they see, discover and feel a new thing. Mobile Learning Technology allows nursing student to easily obtain information and learning materials effectively and efficiently with the result of increasing the laboratory skills of nursing student.

CONCLUSION

Validation assesment by experts concluded that learning applications for laboratory skills are very appropriate to use. The results of the attractiveness test show that nursing student respond very well to the use of Android as a learning media for flipped learning models. Nursing student consider the packaging of material in the form of material, procedural, learning videos and article, as well as the interactivity and ease of use of these media to make material about laboratory skills more interesting to study.

Conflict of Interests

The authors declare that they have no conflict of interests.

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