

Conference Paper

Development of Android Applications to Disseminate Media about Patient Safety Goals for Nurses

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Abstract

Patient safety is an essential part of nursing services and an indicator of the quality of hospital services. One strategy helping to improve the quality of service provided by health workers (especially nurses) is learning about patient safety goals. One form of learning media used is an android application on a mobile smartphone. This application is based on the assessment of material experts, media experts, and nurses. This study uses a development method adapted from the 4D model which consists of four stages, namely: 1) define; (2) design; (3) develop; and (4) disseminate. The results shows the feasibility of creating effective and efficient patient safety goals teaching materials as an interactive learning multimedia for android mobiles. The result indicate: 1) material experts with an percentage of 83.7% which falls into category of very decent; 2) media experts with an percentage of 80% which falls into category of decent; 3) Nurses as a user with an percentage of 86.6% which falls into the very good category. Therefore, it can be concluded that the an android application to disseminate this learning material would be useful and feasible for nurses.

Keywords: patient safety, android application, nurses, mobile smartphone

1. Introduction

Patient safety is an essential part of nursing services and becomes an indicator of the quality of hospital services. Either of strategy in improving the quality of service by health workers especially nurses is through learning about patient safety goals. Several studies have taken measurements of patient safety regarding reported patient safety at some hospitals in the world that have been accredited by J. C. Pham (2016) research which conducted in 11 hospitals from 5 countries found 52 incidents of patient safety that is Hong Kong 31%, Australia 25%, India 23%, America 12% and Canada 10% [1]. While in Brazil the incidence of adverse events in hospitals is estimated at 7.6% [2]. From some of the research results obtained patient safety incidents are still widely found. Based

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on and the impact that occurred, urgency is shown in the importance of understanding against patient safety goals. One form of strategy in minimizing this is through increase in socialization and dissemination of knowledge about patient safety goals. The form of dissemination media is used through an android application on a mobile smartphone [3].

The Internet has touched and changed almost the human life side, reached 3 million Internet users in the world. Predictions from Google Executive Chairman Eric Schmidt mention that by 2020 all the world's populations are connected to the Internet. The International Telecommunication Union (ITU) reports that 80% of teenagers (15-24) in 104 countries are online using Mobile Smartphones. The number of Smartphone usage in Q3 2016 worldwide has touched 7.5 billion, specifically for comparison market shares operating system (OS) is controlled by Android 65%, and the rest by IOS, Windows Phone, and Blackberry [4]. Smartphones in Indonesia now reach about 25% of the total population or about 90 million people and increase 6 million per year. The objectives to be achieved in this research to determine the feasibility of an Android-based dissemination media on good and effective patient safety for nurses [5].

2. Methods

2.1. Research Design

This study uses development method (Research and Development) which was adapted from the 4D model (Four D Model) which consists of four stages, namely: 1) define; (2) design; (3) develop; and (4) disseminate (See Figure 1).

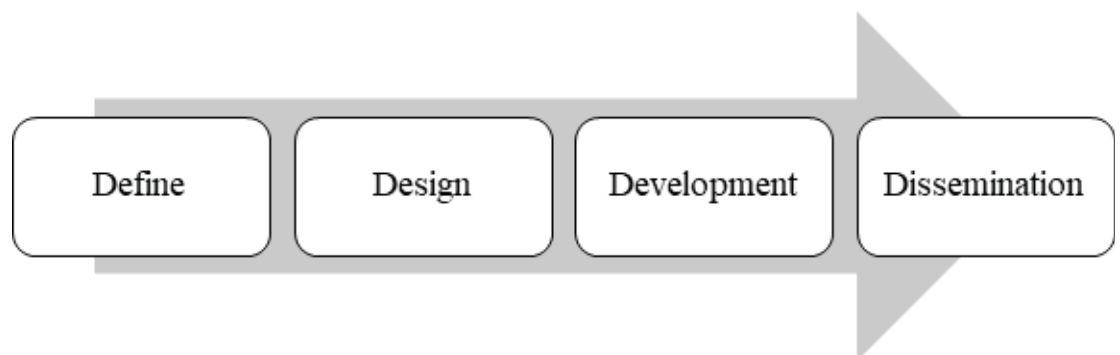


Figure 1: Development Model

2.2. Setting

This research was conducted at Raden Mattaher Hospital, Jambi City, Indonesia. The research time is done in stages starting from June 2020 until August 2020.

2.3. Subject and Object

Subjects and object research in this study are media experts, material experts and usability or nurses as user. The object of this research is Android Application. An experimental test was conducted on 203 nurses. A variable instrument should meet two requirements that are valid and reliable. The test was conducted by non-test in the form of questionnaire of nurses opinion on the feasibility of android application as dissemination media. Validity test is done by media expert judgment by 2 informatics technology expert STIKES Harapan Ibu Jambi and material expert judgment by 2 lecturer STIKES Harapan Ibu Jambi.

2.4. Data Collection Technique

Techniques 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. Interviews were conducted based on several questions about the level of knowledge about patient safety based on SNARS 1st edition.

The instrument used in this study is derived from the Usability Questionnaire J.R Lewis. The Usability Questionnaire J.R Lewis comprises of 19 questions with a Likert scale form. A 7-point Likert scale is made to indicate the degree of agreement or disagreement of each item. Scale 1 states the strong disagreement (strongly disagree) to the intended statement, and scale 7 represents the strong agreement (strongly agree). This questionnaire consisted of 3 (three) factors; *system usefulness* (SYSUSE), *information quality* (INFOQUAL), dan *interface quality* (INTERQUAL). Questionnaire is used to know the opinions of nurses to the learning media that has been made interviews are intended to obtain an overview of the needs used to define the application to be created.

2.5. Data Analysis Technique

The data type of this research is quantitative data. Quantitative data is obtained from scoring scores from experts and nurses 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 nurses as show in table 1.

TABLE 1: Guidelines for Assessment Criteria

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

The feasibility rating scores in the table above will be used as a reference to the results of trials by media expert, material experts and nurses. The results of the scores obtained from the questionnaire will show the feasibility of android applications as a dissemination media.

3. Results

3.1. The Result of Aplication Design

The design stage was conducted by making the navigation map and storyboard. The purpose of the navigation map 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.

The navigation structure provides an overview of the relationship between activities in dissemination media applications. Navigation structure is compiled based on data analysis software needs. Here is the design of the navigation structure with the Main Page from the main menu. There are four menus, such as: material, video, article and information seen in Figure 2.

3.2. The Results of Aplication Development

The development media stage is the realization stage of the flowchart and storyboard design, at this stage the learning media is created using the Android Studio software (see Figure 3).

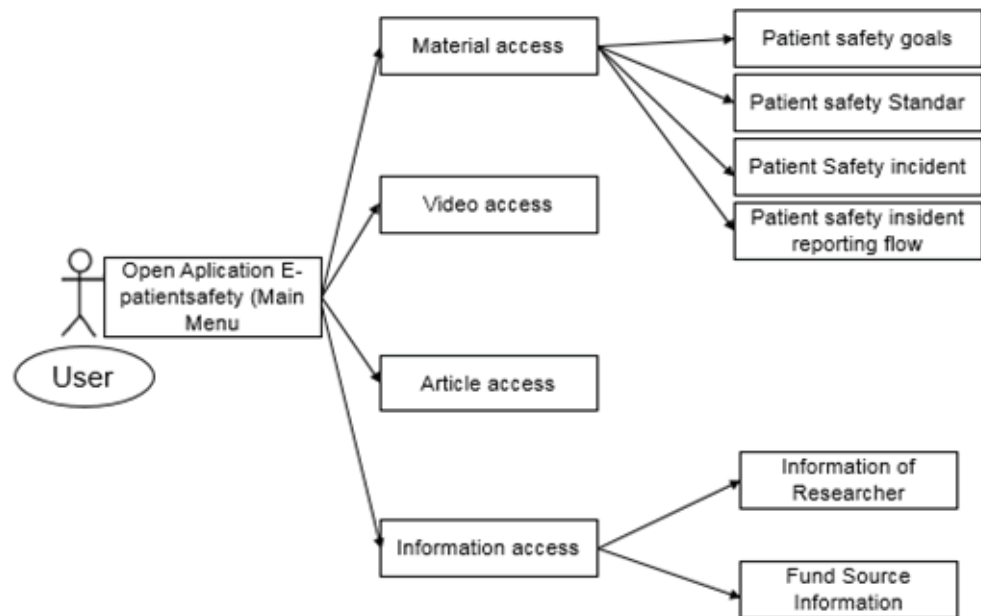


Figure 2: Application Navigation Structure

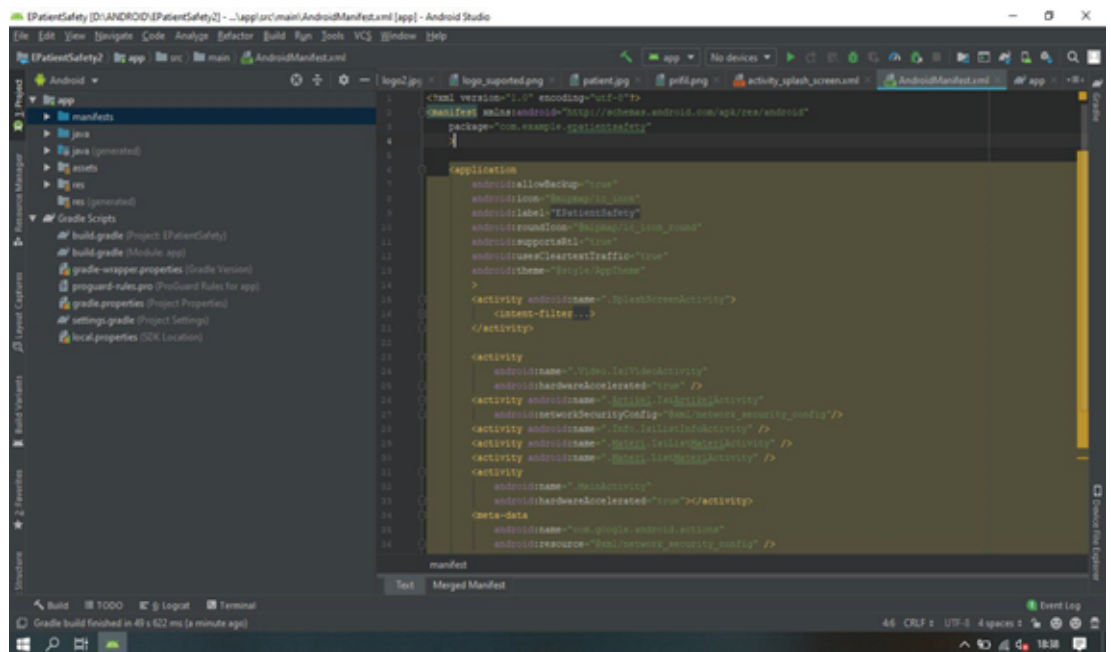


Figure 3: Android Studio View

The next step is to start designing the e-patient safety application interface, menus and items that have been designed using the tools found in the Android Studio software (See Figure 4 and Figure 5)

The final product of the development result is the application of dissemination media to patient safety goals. This android application product can be further utilized for learning activities of patient safety goals for nurses in hospital, Jambi city, Indonesia. Here is a visual overview of the application product learning media operation of the

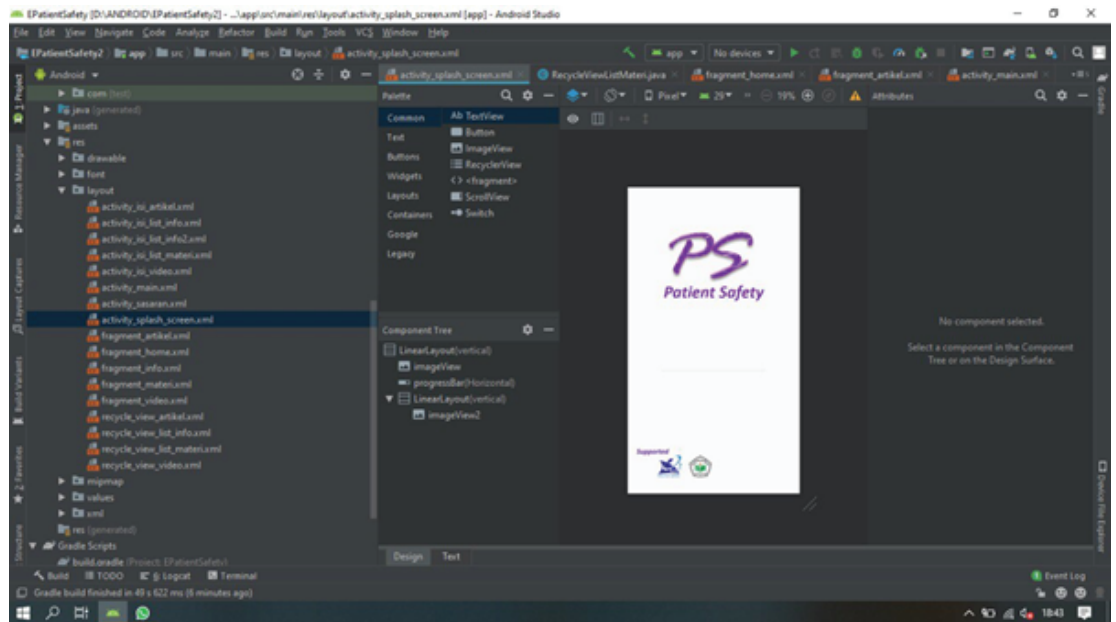


Figure 4: Interface of E-Patient Safety Application

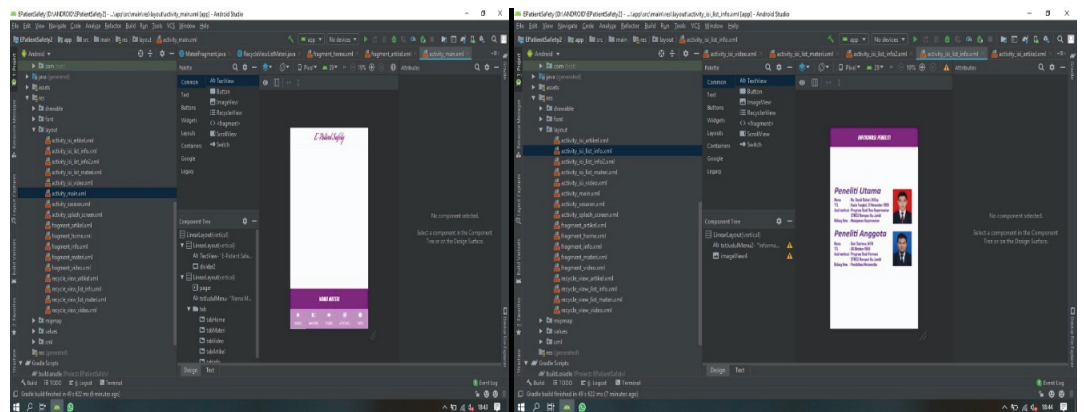


Figure 5: Development Items and menus of E-Patient Safety Application

e-patient safety main page, material pages, video pages and article which run using Android (See Figure 6).

3.3. The Results Validation of Media Expert and Material Expert

3.3.1. The Results of Media Expert

The results of the media expert validation on the eligibility of the e-patient safety application can be seen in the graph below (see Figure 7).

Based on the Figure 7, explains the assessment results by media experts on the general aspect which obtain percentage 80%. The score can be interpreted as application

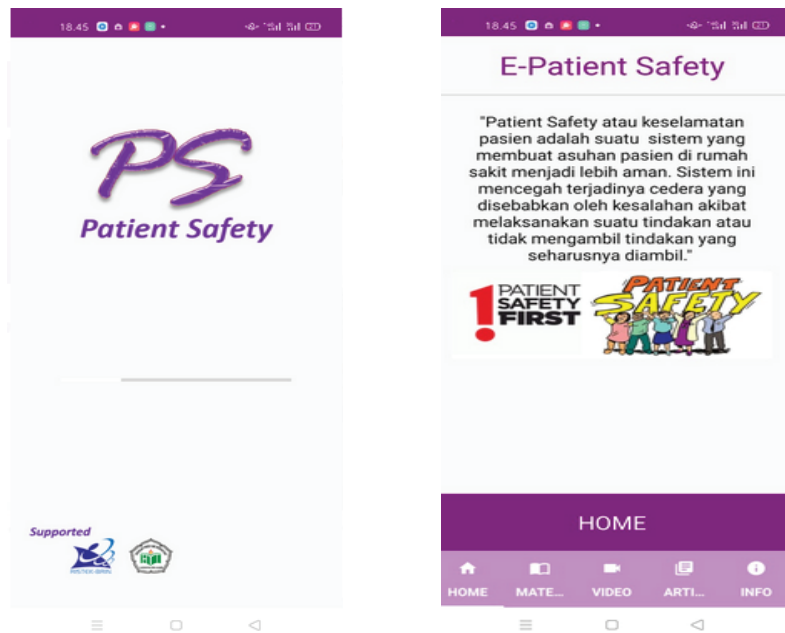


Figure 6: Final Product of E-Patient Safety Application

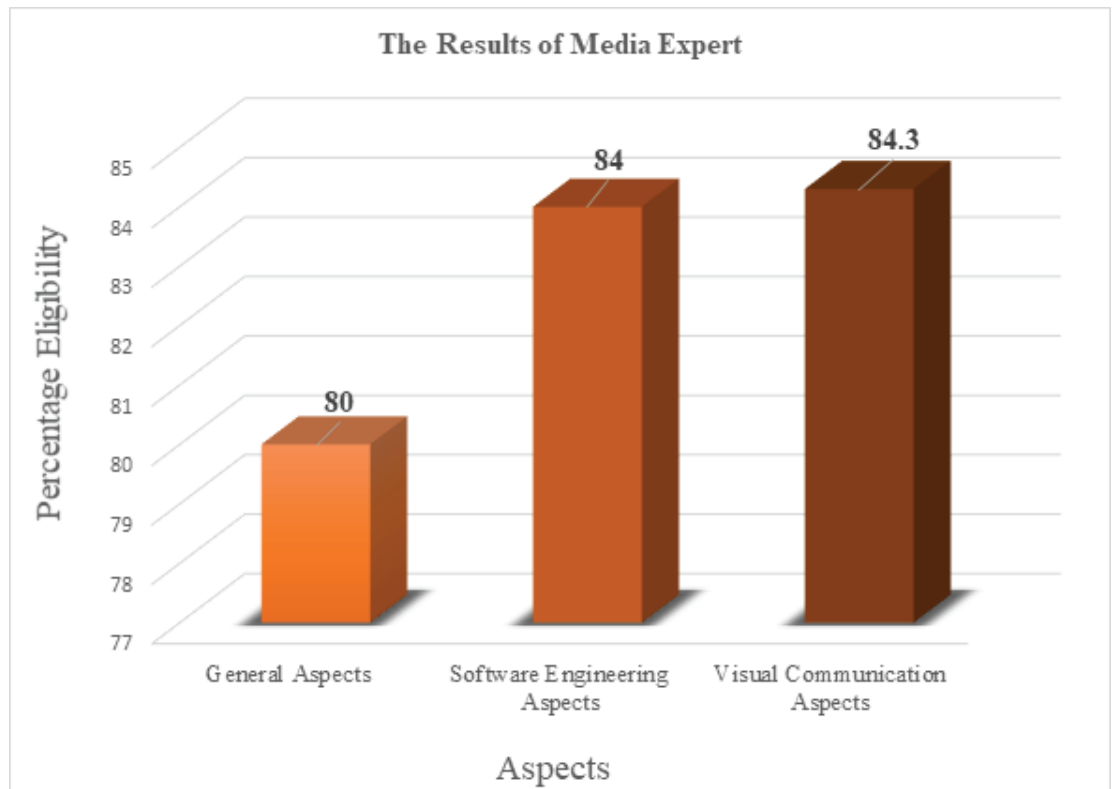


Figure 7: The Results of Media Expert based on aspects

of general aspect is decent to use. Aspects of software engineering obtain percentage 84%, the score can be interpreted as application of dissemination media is very feasible to use. Aspects of visual communication obtain percentage 84,3%, the percentage can

be interpreted as application of dissemination media is very decent to use. Overall dissemination media applications get a percentage 83,7%, with these percentage can be interpreted as application of dissemination media is very decent to use.

3.3.2. The Results of Material Expert

The results of the material expert validation on the eligibility of the e-patient safety application can be seen in the graph below (See Figure 8)

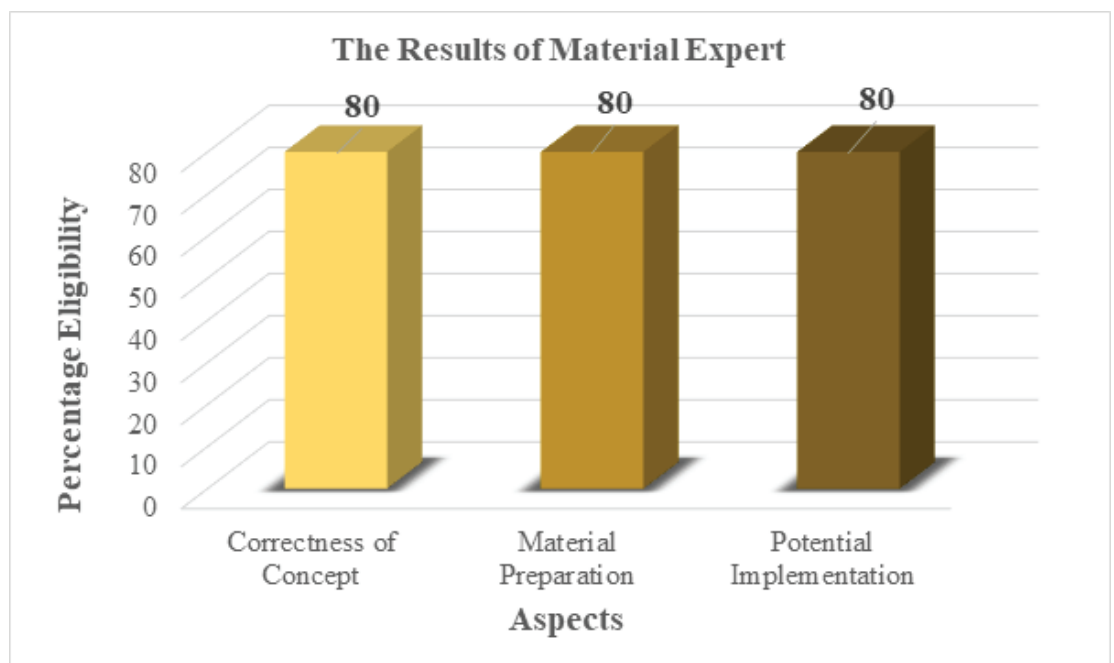


Figure 8: The Results of Material Expert based on Aspects

Based on the Figure 8, explains the assessment results by material experts on the correctness of concept aspect which obtain percentage 80%. The score can be interpreted as correctness of concept aspect is decent to use. Aspects of material preparation obtain percentage 80%, the score can be interpreted as application of dissemination media is very feasible to use. Aspects of potential implemetation obtain percentage 80%, the percentage can be interpreted as application of dissemination media is decent to use. Overall dissemination media applications get a percentage 80%, with these percentage can be interpreted as application of dissemination media is very decent to use.

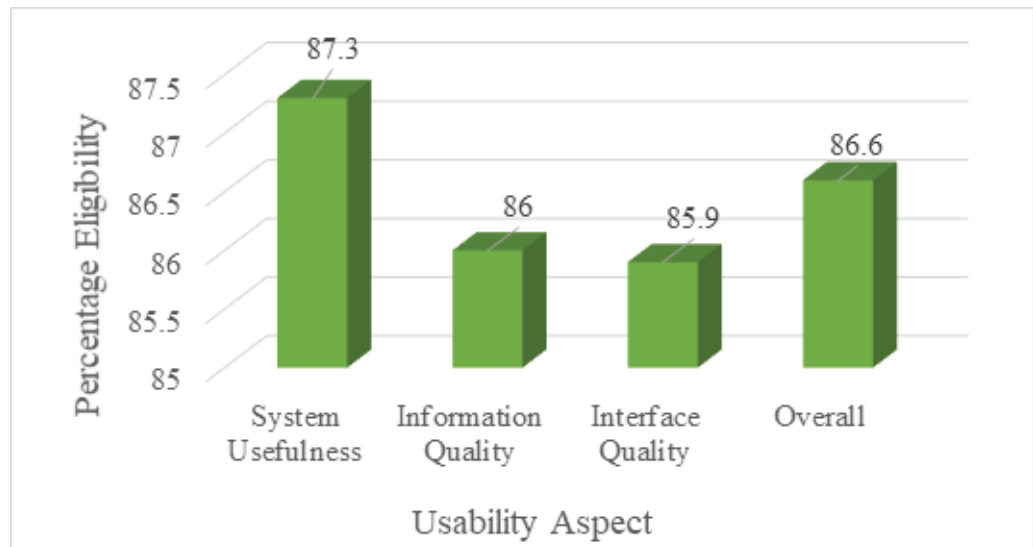


Figure 9: The Result of Usability or Nurses a user

3.4. The Results of Nurses as User

The results of the nurses as user assessment on the dissemination media method obtain the average percentage 86,6% which means the application of dissemination media is suitable for use. Aspects of system usefulness obtain a mean percentage of 87,3% which means the application of dissemination media is very decent to use. Aspects of information quality obtain average percentage of 86% which means the application of dissemination media is very feasible to use. Aspects of interface quality obtain average percentage of 85,9% which means the application of dissemination media is very feasible to use. Overall dissemination media applications very well used by nurses.

4. Discussion

Based on the results of the attractiveness test, overall dissemination media applications very well used by nurses. The attractiveness includes aspects of the system usefulness, attractiveness of information quality, attractiveness of interface quality and attractiveness as a dissemination medium as a whole.

The results of the attractiveness test show that nurses respond well to the use of Android as a media for dissemination. Nurses consider the packaging of material in the form of descriptions and audiovisuals, as well as the interactivity and ease of use of these media to make material about patient safety more interesting to study.

This is in line with the research results Khaerudin Saed et.al (2018) which conclude that media-based learning using android mobile learning is very feasible (76,67%) [6].

This is also in line with the results of research by Harahap, Hasruddin, and Julia (2015) 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 very good [7].

The development of android-based mobile learning as the learning media can serve as one of the solutions to cope with the learning problems, both in terms of time limitations, media & broadcasting, and learning methods. The utilization of android-based-mobile learning media which uses offline system operation can run well and effectively so that the media give effect on the improvement of the learning results [8]. Technology can be used as one of sources and learning media which is effective and capable of changing a conventional learning into a modern [9].

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

5. Conclusion

The conclusion can be taken based on data of research result and discussion of android application development as learning media is very decent. Comparison with other digital learning media such as using desktop based/notebook-based multimedia is quite troublesome, expensive and immobile for the learner.

The assessment of media experts is based on 3 aspects, namely: aspects of general, software engineering aspect and visual communication get a percentage of 83,6% or including "very decent". Assessment of material experts is assessed based on 3 aspects: the aspects of correctness of concept, material preparation aspects and potential implementation aspects get a percentage of 80% which means "decent" is used.

Assessment by nurses is assessed based on 3 aspects namely system usefulness, aspects of information quality and interface quality aspects. Overall dissemination media applications very well used by nurses nurses (86,6%).

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Conflic of Interest

The authors have no conflict of interest to declare.

References

- [1] Pham, J. C., *et al.* (2016). A Tool for the Concise Analysis of Patient Safety Incidents. *Jt. Comm. Journal Quality Patient Safety.*, vol. 42, issue 1, pp. 26–33.
- [2] Costa, *et al.* (2017). Evaluation Procedures in Health: Perspective of Nursing Care in Patient Safety. *Appl. Nurs. Res. Res*, vol. 35, issue 71, p. 6.
- [3] Januszewsky and Molenda. (2008). *Educational Technology*. US: Tailor & Francis Group.
- [4] International Telecommunication Union. (2017). ICT Facts and Figures 2017. *Geneva 20 International Telecommunication Union*.
- [5] Scientia Mobile. (2017). *Mobile Overview Report January – March 2017*.
- [6] Said, K., Kurniawan, A. and Anton, O. (2018). Development of Media-Based Learning Using Android Mobile Learning. *Journal Theory Appl. Inf. Technology.*, vol. 96, issue 3, pp. 668–676.
- [7] Harahap, *et al.* (2012). Pemograman Aplikasi Mobile Smartphone dan Tablet PC Berbasis Android. *Informatika*.
- [8] Musahrain. (2016). Developing Android-Based Mobile Learning as a Media in Teaching English. Presented at *2nd Int. Conference Teaching Training Education Sebelas Maret University*, vol. 2, no. 1, pp. 307–313.
- [9] Anitah. (2009). *Technological Learning*. Surakarta: Yuma Libarary.