Four-D Models Method Validation Analysis of an Android-Based Learning Media

Yuliawati Yunus¹, Monica Fransisca²

¹,²Faculty of Teacher Training and Education, Universitas Putra Indonesia “YPTK” Padang, Padang, Indonesia

* yuliawati_yunus@upiyptk.ac.id

Abstract. This article presents the results of validation analysis of an android-based learning media that is applied to entrepreneurship subjects which specialized in tourism majors at vocational schools in Padang. The main object of this learning media was it can be accessed via mobile phone and this learning media accessible for teachers and students anytime, anywhere. The validation analysis of learning media was obtained from media experts and content experts. The validation results were used as reference for utilization of an android-based learning media at vocational school in Padang.

Keywords: education, vocational school, learning media, validate, android.

1. Introduction

Learning media is one of the important factors in learning activities [1]. The development of advanced information technology, nowadays often known as the industrial revolution 4.0 or digitalization era has an influence for education field, especially in terms of learning media’s utilization. Through the current digitalization process, learning media are no longer only in a form of conventional media, there are many learning media which use information technology. Learning media that used to be only conventional learning media, nowadays these media can be converted into visual form with the use of information technology which certainly could be more effective and efficient [2].

The presents learning media is not only limited to the use of software on computers or laptops, but learning media can be combined with the use of internet technology. The usage of learning media by utilizing online media could be implemented because many of schools right now has school facilities and infrastructure with computers and internet that can be used by students and teachers for learning activities[3]. The internet itself is a global forum where everyone can interact whenever and wherever [4]. The learning media could be developed by utilizing internet technology and Android technology [5]. Through the utilization of an android, the learning media could be accessed more easily. [6]

Based on the observation which conducted beforehand, it could be concluded that mostly the vocational school in Padang were using conventional learning media. Even though the school’s facilities provided technologies for learning media, it was not used by the teachers. The students might be fluent with technologies but not for the teacher. Most of the teacher was not used to the technologies especially with internet and its application. To make a development for learning media which will use internet technologies it will need to validate with the experts first before applied for mass utilization.
This android-based learning media was designed especially for entrepreneurship subjects and specifically for tourism major’s students at vocational high school in Padang. The learning media was then validated by involving media experts and content experts to be tested and analyzed for the validation’s level. If the level of validation is on a good scale then the learning media can be categorized as valid to be used as a learning media in learning activities. The validation would be processed with questionnaires and opinions from these media experts and contents experts.

2. Fundamental Theories

The learning process that was carried out may not be as successful as expected without the help of learning media. Learning media was a component that must be considered by the teachers in learning activities [7]. Media is a tool that used to make it easier for students to accept the learning process or knowledge’s sharing which could stimulate student’s thoughts and feelings to increasing their learning desires [8]. The learning media shows its functions or roles to regulating effectiveness of relations between the learning process of students and the content of the lessons [4]. The design of learning media contains of several important points, such as: (1) User Compatibility, (2) Task Compatibility, (3) Consistency, (4) Familiarity, and (5) Simplicity [7].

The utilization of an android-based learning media was the development of mobile learning. The definition of mobile learning is a learning model that utilizes information and communication technology. In learning concepts, the advantage of mobile learning was the availability of lesson materials which can be accessed at any time and visualization of interesting material and could be accessed from anywhere and at any time. But the lessons itself doesn’t always suitable to the usage of mobile learning. As an example of lessons that is not suitable for mobile learning media, such as: lesson which including ”hands on skills”, for example is a dentist, the art of music especially creating songs, interview skills, team work such as marketing and lesson that required expression such as dance [6].

3. Methodology

The development of android-based learning media for entrepreneurship subjects at tourism majors in vocational school at Padang was using research and development methods. The definition of development research method is a research method which used to produce a particular product, then carried out a validation test before the product is used. [9] Before producing a certain products, it needs an analysis and a test of the effectiveness and validation of these products in order to function in the wider community. There are ten steps that must be done on research and development methods, as can be seen in Figure 1 [5].
Based on those figures above, the first step was doing an observation and collecting data for needed analysis. This analysis should be conducted to find out student’s requirement and learning media which provided by schools. If the analysis needed was done then the second step was making a plan for learning media which would suitable with student’s requirement and school’s facilities. This plan would be a basic fundamental for learning media, and then the designing product will be processed. An initial trial phase in small capacity would be conducted after the first design of product finish, this will be included with questionnaire regarding the first design of product or learning media, in this case it was android-based learning media. If there were revision needed, then it will be followed up with revision for the learning media, but if there were no revision needed then the next step is doing a trial phase with a big scale of capacity. In case there were no needed for another revision, then the learning media product will be finalize and implemented for the students which will be an objects for the research.

Android-based learning media were developed using the four-D models method which was developed by Thiagarajan [10]. This models consists of four steps which included define step, design step, develop step, and disseminate step. Each step in those models should be conducted one by one with following order. These steps could be seen in figure 2 and followed up by the explanation based on the research.

**Figure 1. Research and Development Methods**

**Figure 2. Four-D Model’s Method**
designed. The last step was disseminate, this step contain of implementation of the android-based learning media. Disseminate could be conducted only if the result of validation’s level was in a good range.

4. Results and Discussion

The results design of an android-based learning media were in a form of applications that can be accessed via android at least android version 2.3 and the latest android maximum is android 10.0. This application could be downloaded via Playstore for free, without fee needed. The appearance of the application is as follows: (1) About application’s menu, (2) Creators profile’s menu, (3) Home’s menu, (4) Lesson’s menu, (5) Question’s menu. Each of these menus could be access by students anytime and anywhere, even though there is no internet connection, it still could be accessed. This feature absolutely makes it easier for students to using this learning media, not only for students but also for the teachers. The details of application can be seen as these follows figures.

![Tentang Aplikasi](image)

**Figure 3. About Application’s Menu**

This menu explains about all menus that was shown in application, and explains the function of each button. As an example, the first button was explained about syllabus of the subjects, the second button was explained about lessons, and the third one was explained about evaluated or test for the students.
Figure 4. Creators Profile’s Menu

This menu was used to explain about the application’s creator, which was consists of two creators. The creator were a lecturer at faculty of teacher training and education.
Home’s menu contains several options that can be accessed by the users. From the figure 5 it could be seen there are six main menus as follows: (1) Syllabus, this menu explains the syllabus for each class level, (2) Lessons, this menu consists of study’s lesson which presented by each chapter, (3) About, this menu explains about application and function for each menus (4) Video, consists of video’s lesson which uploaded by the teachers, (5) Evaluate or test, this menu consists of question for practice session and test session, (6) Creator’s profiles. This menu will appear right after the icon’s application clicked, and would be the same as for students and the teachers.

Figure 5. Home’s Menu
This menu consists of learning material or lesson that has been designed based on the division of materials per chapter. For an example, there are six chapters for entrepreneurship subject. Each chapter contains of study’s lesson which created based on syllabus for each class level. The students could access these chapters by themselves, so it could improve the learning process and learning activities for students.
Figure 7. Question’s Pages

In this menu students can work on the provided practices questions which created by the teachers.

The validation process was conducted with media experts and content experts which consisting of five experts after finalizing the learning media’s design. These five experts divided into three experts of media, and content experts which consist of two experts. The average of validation’s assessment based on media’s experts is at percentage 98.33%. There were no revision from media’s experts, it was concluded that this android-based learning media is good to use for learning activities. The validation’s assessment average based on content’s experts is at percentage 94.5%, with a few revisions for contents. After completing the revision then the content’s expert gave an agreement for utilization this android-based learning media for learning activities.
The finale result of the validation’s assessment from the experts was the validation’s level of this android-based learning media which was at a percentage of 96.8%. This validation’s assessment was done through a questionnaires consisting of 20 question items. The question items are divided into four main items which consists of the feasibility of the contents, the language components, the presentation components, and the graphic component. The feasibility of contents divided into five questions which included questionnaire about android-based learning media itself and the suitability of the learning media with learning contents. As for language components were included questionnaire about the font which used, the contents of lessons, and the way lessons were presented. Presentation components consist of questionnaires about the learning presentation’s scheme, the following order of the lessons, and the feedback from the students. The last component was graphics which consist of the application’s features and illustrations which used in the lessons material.

The results of the validity’s assessment can be seen in the results of data processing as in a form of frequency distribution diagrams and followed up with the explanation of the diagram itself.

![Validity's Test Frequency Diagram](image)

The highest score from the questionnaire was at point 99, and the lowest score was 91, so the differential only by 8 point. Based on these points it could be concluded that the class was at 3.30 point and the interval was at 2.41 point. The class intervals were divided into 3 ranges as follows: (1) first range 91-93, (2) second range 94-96, and (3) third range 97-99. The frequency for the first range which is 91-93 point were at 1 frequent, and for 97-99 point were at 4 frequent. So the percentage was 20% for first range (91-93 point) and 80% for the third range (97-99 point), meanwhile the second range which is 94-96 point was at 0%.

5. Conclusions

The validation analysis was based on the product of learning media in this case it was android-based learning media. The learning media was designed with research and development method combined with four-D models. Validation process was done after the finalization of the learning media.

The frequency distribution diagram shows good validity results, with an average of 96.8% and categorized as Very Valid. This result was obtained from the assessment of five experts consisting of media experts and content experts. Based on this validation result and analysis, it can be concluded that this android-based learning media can be used for entrepreneurship subjects in the department of tourism at vocational school in Padang.

References

[1] M. Ali, “Pengembangan Media Pembelajaran Interaktif Mata Kuliah Medan Elektromagnetik,” *J. Edukasi@Elektro*, vol. 5, no. 1, 2009.

[2] M. Fransisca and Y. Yunus, “Efektivitas E-Learning Tingkat Sekolah Menengah Atas Kota...
Padang,” *Indones. J. Comput. Sci.*, vol. 8, no. 2, pp. 113–120, 2019.

[3] A. P. Oetomo, “Pengembangan Bahan Pembelajaran Mandiri Komputasi Fisika Dengan Menggunakan Moodle Secara Online Di Jurusan Fisika Universitas Negeri Semarang,” Universitas Negeri Semarang, 2006.

[4] N. Solichatun, “Pengaruh Media Pembelajaran Animasi Terhadap Hasil Belajar Siswa Pada Pelajaran Audio Mixer Kompetensi Keahlian Teknik Audio Video di SMK PIRI 1 Yogyakarta,” Universitas Negeri Yogyakarta, 2012.

[5] M. Fransisca and Y. Yunus, “Validitas Pengembangan Media Pembelajaran Blended Learning Berbasis Cloud Computing Tingkat Sekolah Menengah Atas Kota Padang,” in *Prosideing Seminar Nasional Riset Information Science (SEMARIS)*, 2019, no. September, pp. 103–109.

[6] A. Durin, *Mobile Technology for Children Designing for Interaction and Learning*. USA: Elsevier, 2009.

[7] M. Fransisca, Y. Yunus, and A. D. Sutiasih, “Practicality of E-Learning as Learning Media in Digital Simulation Subjects at Vocational School in Padang Practicality of E-Learning as Learning Media in Digital Simulation Subjects at Vocational School in Padang,” *J. Phys. Conf. Ser.*, 2019.

[8] P. E.S, “Optimalisasi Prestasi Belajar Matematika Melalui Pembelajaran Dengan Media CD Interaktif (Multimedia) Bagi Siswa Kelas 7-C SMP Negeri 1 Sruweng Kabupaten Kebumen,” *pdii*, vol. 2, no. 1, p. 95, 2009.

[9] Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: ALFABETA, 2013.

[10] Trianto, *Mendesain Model Pembelajaran Inovatif-Progresif*. Kakarta: Kencana, 2009.