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Submission date: 24-Oct-2022 07:58AM (UTC+0700)

Submission ID: 1933321812

File name: Wijaya_2021_J._Phys._Conf._Ser._1810_012041.pdf (658.01K)

Word count: 3025

Character count: 16981

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To cite this article: I Wijaya *et al* 2021 *J. Phys.: Conf. Ser.* **1810** 012041

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Validity testing of blended learning based on android smartphones in computer device maintenance course

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Abstract. This study aimed to determine the validity level of blended learning media to support the blended learning process. This was a Research and Development (R&D) using the 4D development model. The model involved four steps, namely: 1) Define, 2) Design, 3) Development, and 4) Assessment. Based on the research that has been done, the average value of the test assessment for Android media to support the learning process through Blended Learning is 94.28% which level of validity can be interpreted as very valid. Based on the assessment and input from material experts, Android application software experts and multimedia experts, it can be concluded that the blended learning media is suitable for learning the maintenance of computer devices in the Informatics Engineering Education Department.

1. Introduction

The non-optimal learning media for Blended Learning based on Android Smartphones in the Computer Device Maintenance Course in the Informatics Engineering Education Department has an impact on the achievement of student learning outcomes. This causes the learning process to be ineffective for students. Media plays an important role in the world of education. Hamalik, as quoted by [1], states that the use of instructional media in the teaching and learning process can generate new desires and interests, generate motivation and stimulation of learning activities, and even bring psychological influences towards students. The same thing is also conveyed by [2], who states that communication and information technology has a very important impact on learning, especially in increasing learning outcomes and student attractiveness and satisfaction in learning.

Variations in learning are not optimal due to the absence of Android Smartphone-based Blended Learning media and the rare use of Android-based learning media by utilizing smartphones owned by students in delivering subject matter. Educators are at the forefront of the learning process, because they help students to get good learning resources. Moreover, in today's development, educators must be creative and innovative in choosing good learning sources, so as to create conducive teaching and learning activities. The creation and innovation in teaching are expected to make learning activities to be more active, creative, innovative, and fun so that there are multi-interactions between educators and students, students and educators, students with learning media and learning resources, and students with other students so that they get good learning results.

Android-based learning media with the use of smartphones are expected to be additional learning sources that can help foster student motivation in learning. CepiRiyana (Guidelines for Interactive Multimedia Development: page 3) writes "In many cases, manual materials or modules are not able to solve the learning problems faced by training participants to easily and quickly achieve the competencies



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to be achieved, for that it is necessary to develop alternatives. The available alternatives for such condition are among others by using the Video program and the Interactive Multimedia Module. Research by Rian Vebrianto and Kamisah Osman also states that the teaching and learning process using a variety of constructive learning media has increased the achievement of SPS and Science among students (2011).

This Android-based learning media uses the blended learning method in the learning process. According to Semler (2005), "Blended learning combines the best aspects of online learning, structured face-to-face activities, and real-world practice. Online learning systems, classroom training, and on-the-job experience have major drawbacks by themselves. The blended learning approach uses the strengths of each to counter the other weaknesses. Blended learning is an ease of learning that combines various ways of delivery, teaching models, and learning styles, introducing various media choices for dialogue between the facilitator and the person being taught. Blended learning is also a combination of face-to-face teaching and online teaching, but more than that as an element of social interaction".

Android-based learning media with the use of this smartphone includes learning animations, video tutorials, practice questions and tests, which are related to the Computer Device Maintenance course. This Computer Device Maintenance course is a compulsory subject in the Informatics Engineering Education study program. This course contains material on Hardware Maintenance, Software Maintenance, Computer Installation and Assembly, Personal Computer (PC) disassembly materials which often result in component damage caused by frequent dismantling. For this reason, Android-based learning media are used with the use of an Android smartphone as another reference for this Computer Device Maintenance course. With this Android smartphone students will be guided through interesting animations that can be tried out as a substitute for direct practicum.

The purpose of this study is expected to produce an interactive blended learning module which provides 1) a simulation program to replace the direct practicum which can reduce the risk of equipment damage and reduce costs arising from the damage. 2) Solutions as creative and innovative learning media to improve student learning outcomes. 3) Teaching materials for the Computer Device Maintenance course.

2. Theoretical

2.1 Interactive Learning Media

According to Flemming (1987: 234) in AzharArsyad (2011: 3)[3], "... the media is often referred to as a mediator, namely a cause or tool that intervenes in two parties and reconciles them. The term media mediator indicates its function or role, namely to regulate the effective relationship between the two main parties in the learning process". "Interactive concepts in learning are most closely related to computer-based. Interactive means having the influence of each other. Computer learning will give students the opportunity to use learning materials that can interact better"[4].

Indra Wijaya [5] suggests that interactive media has the following characteristics :

- 1) Combining several media elements such as text, images, audio, and video.
- 2) Ability to accommodate user responses.
- 3) Being independent, in the sense of providing ease and completeness of the content in such a way that users can use it without the guidance of others.
- 4) Fulfill the function to strengthen user response as soon as possible and as often as possible".

"Based on the characteristics of interactive media, it can be seen that interactive learning media must fulfill its function as a learning medium that is able to accommodate user responses through interaction and generate actions and reactions between the media and its users, so as to strengthen the user response as quickly and as much as user wants when giving action"[6].

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computer-based. Interactive means having the influence of each other. Computer learning will give students the opportunity to use learning materials that can interact better"[4].

2.2 Blended Learning

According to Semler (2005) [3], "Blended learning combines the best aspects of online learning, structured face-to-face activities, and real world practice. Online learning systems, classroom training, and on-the-job experience have major drawbacks by themselves. The blended learning approach uses the strengths of each to counter the others' weaknesses."

Semler (2005) also explains that "Blended learning is learning that is supported by an effective combination of delivery methods, different teaching methods and learning styles and is found in open communication between all parts involved in the training ". As for the advantages of using blended learning as a combination of direct (face-to-face) teaching and online teaching, it is more than that as an element of social interaction, namely:

- a. There is an interaction between teachers and students.
- b. Teaching can also be online or face to face
- c. Blended Learning = combining instructional modalities (or delivery media),
- d. Blended Learning = combining instructional methods

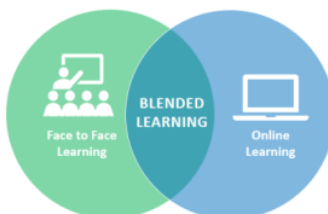


Figure 1. Blended Learning Method (sevima.com 2019).

The benefit of using e-learning and blended learning in education today is that e-learning provides flexibility in choosing the time and place to access lessons. Students do not need to travel to where the lessons are delivered, e-learning can be done from anywhere, whether they have access to the internet or not.

Blended learning provides the best opportunity to learn from the transitional classroom to e-learning. Blended learning involves classroom (or face-to-face) and online learning. This method is very effective at adding efficiency to classroom instruction and allowing for increased discussion or review of information outside the classroom.

2.3 Definition of Android

SugengPurwantoro, HeniRahmawati and AchmadTharmizi (2013: 177) [7] said "Android is a software that is used on a mobile device (running device) which includes the operating system, middleware, and core applications". Android, according to Satyaputra and Aritonang (2014: 2)[8], is an operating system for smartphones and tablets. The operating system can be illustrated as a bridge between a device and its use, so that users can interact with their device and run applications available on the device. ArifAkbarul Huda (2013: 1-5) [9] argues that Android is a Linux-based operating system specifically for mobile devices such as smartphones or tablets.

This Android operating system is open source, so a lot of programmers have flocked to create applications or modify this system. Programmers have a very big opportunity to be involved in developing Android applications because of the open source reasons. Most of the applications on the Play Store are free, while there are also some paid applications.

3. Method

The design of Blended learning based on Smartphone android in the Computer Device Maintenance Course was a research and development (R&D). According Sugiyono[10], "Development research method is a research method used to produce a particular product, and test the effectiveness of the product. The resulting product is not always in a form like books, stationery, and other learning tools. But it can also be in the form of software". The learning media of of Blended Learning Based on Android Smartphones in the Computer Device Maintenance Course is developed using the following four-D models developed by Thagarajan, (1974) in Trianto (2007)[11]:

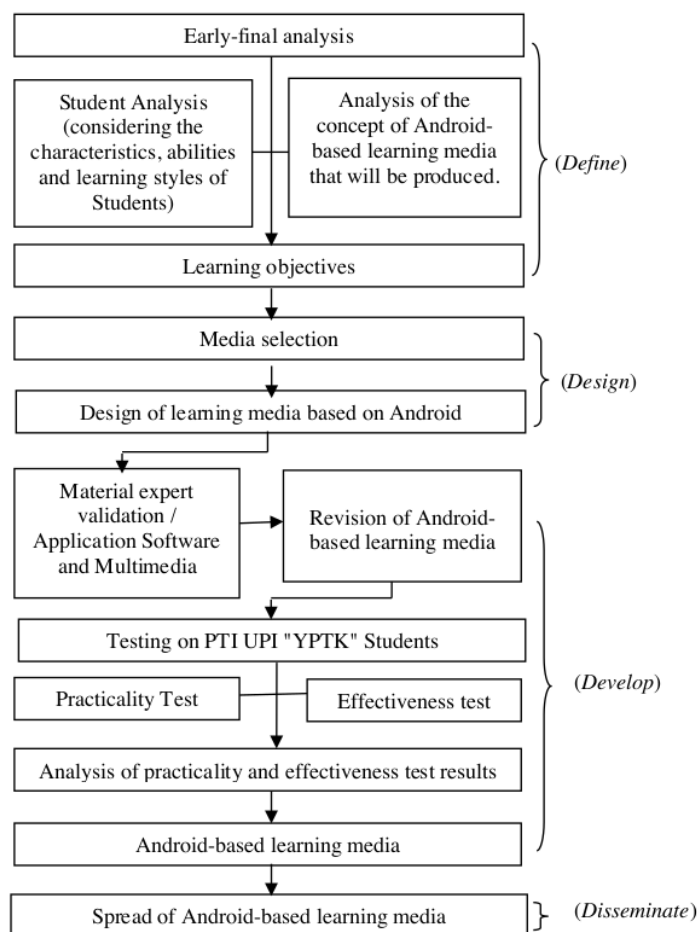


Figure 2. 4D Models.

4. Results and Discussion

4.1 Design Results

The results of the design and appearance of the product can be explained in the sections below:

4.1.1 Home Screen Page and Main Menu Page. This home screen page is the initial loading of the product display overview and the main menu page is the main page on Android media. The main menu consisted of instructions, competencies, material, training. These instructions are display usage of Android Media. The picture of the Home screen and main menu page for Use are as follows:



Figure 3. Home Screen.



Figure 4. Main Menu

4.1.2 Basic Competency and Learning Material Pages. The page of Basic Competency and Learning Material Pages contains Competency Standards, Basic Competencies and learning objectives from Basic Programming Subjects. Material 1 is about determining user requirements. In the first material, there are several components, namely, a) Explaining the meaning and types of data types, b) Explaining the meaning of identifier, c) Explaining about the kinds of basic operations. The picture of the Competency page and the Learning Material Page can be seen below :



Figure 5. Basic Competence.

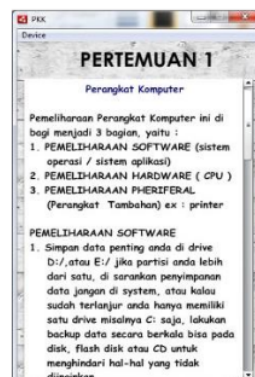


Figure 6. Learning Material Page.

4.2 Analysis of Validity.

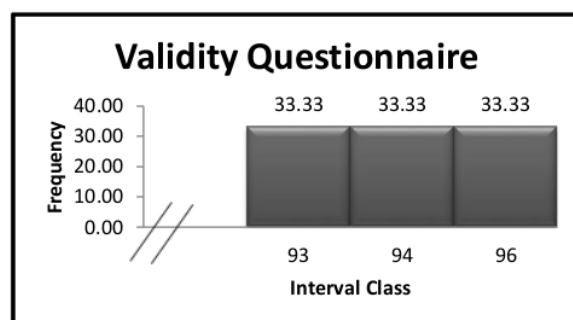
Android-based media validation from the validator was carried out to assess the design, material, and effectiveness of the media. The validator provided ratings, comments, and suggestions on the android media design by filling the questionnaire provided. This android media validation was assessed by 3 assessors. Data from the validity test results can be seen in Table 1 below:

Table 1. The results of the data validity questionnaire.

NO	Name	Content eligibility					Language Component				Serving Components						Graphic Components					X	X'
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
1	Harikamsyah Andriyanof, M.Kom	5	4	5	5	4	5	5	5	4	5	5	5	4	5	4	5	5	4	5	5	94	8836
2	Yuliaswati Yumur, M.Pd.T	4	5	4	5	5	5	5	5	5	4	5	5	5	4	5	5	5	5	5	5	96	9216
3	Widhi Marta Sds, M.Sa	5	5	4	4	5	4	5	5	5	4	4	4	5	5	5	5	5	5	5	4	93	8649
Total																						283	26701
Validity Value		93.33	93.33	86.67	93.33	93.33	93.33	100.0	100.0	93.33	86.67	93.33	93.33	93.33	93.33	93.33	100.0	100.0	93.33	100.0	93.33		
Σ Average Value of Validity		1886.67																					
Average Value of Validity		94.33																					

No	Interval Class	f0	%f0
1	93	1	33.33
2	94	1	33.33
3	96	1	33.33
Total		3	100

The following is an explanation of the results of the validity test to find class intervals and class lengths can be seen in the graph below:

**Figure 7.**Graph of Questionnaire Validity

The average value of the 3 validators were 94.33%, and looking at the interpretation criteria table, it can be concluded that the validation of Blended Learning Media Based on Android Smartphone is very valid. The validity through the evaluation of the validator test for learning media based on android was 94.28%, so the level of validity can be interpreted as very valid to be used in the Computer Device Maintenance course for the UPI YPTK Padang Informatics Engineering Study Program. With the use of Android-based learning media, it is hoped that it can improve learning outcomes in blended learning. It refers to research conducted by Sefriani, R., & Sepriana, R. (2020) which resulted in the finding that e-learning helps improve learning outcomes of students in the Technology and Vocational Education curriculum. Research from Sefriani, R., Wijaya, I., Menrisal, M., & Dewi, M. (2020) [12] on Interactive learning module for Creative Learning and Entrepreneurship obtained the level of validity 91.92%, so that the level of validity used is very valid. Thus, the research conducted by IndraWijaya [13] had a better validity level than the research conducted by Rini Sefriani. Thus Android-based learning media in blended learning is very valid for use in Android-based learning in blended learning in computer maintenance courses.

5. Conclusion

The design and production of Android-based learning media follows the procedure and development (Research and Development) . Based on the description, data analysis, and development of Android-based learning media, it can be concluded that the media of Android-based blended learning is very valid to be used in the Computer Device Maintenance course to UPI YPTK Padang Informatics Engineering Education study program with the 94.28% validity value through the validator test assessment of Android-based learning media.

References

- [1] Arsyad A 2007 *Media Pembelajaran* (Jakarta: PT. Raja Grafindo Persada)
- [2] Olmedo-Torre N, Vidal O F, Castillo J L and Rodríguez F B 2017 The Influence of ICT on Learning in Graphic Engineering 7th International Conference on Intercultural Education "Education, Health and ICT for a Transcultural World" Elseiver available in www. Sciencedirect.com. accessed on March 25, 2017
- [3] Semler 2005 *Blended Learning* available in http://en.wikipedia.org/wiki/blended_learning, accessed on August 28, 2019
- [4] Wijaya I and Sefriani R 2016 Interactive Multimedia CD Design Chemistry Lesson In Concept Training Material and amendment For Class X Vocational High School (SMK) *Journal Of Dynamics (International Journal of Dynamics in Engineering and Sciences)* **1**
- [5] Wijaya I and Tanjung F 2017 Perancangan dan Pembuatan Media Pembelajaran CD Interaktif Berbasis Macromedia Director MX pada Mata Pelajaran Pemrograman Web Dinamis *PENDIDIKAN TEKNOLOGI INFORMASI UPI-YPTK* **4**
- [6] Indra W and Rini S 2017 Interactive Modules Based Adobe Director On Computer Assembling Subjects For Vocational Secondary School Students *VOLT Jurnal Ilmiah Pendidikan Teknik Elektro* **2** 73-80
- [7] Sugiyono 2013 *Metode Penelitian Kuantitatif, Kualitatif dan R & D* (Bandung: Alfa Beta)
- [8] Sugeng P, Heni R and Achmad T 2013 Mobile Searching Objek Wisata Pekanbaru Menggunakan Location Base Service (LBS) Berbasis Android *Jurnal Politeknik Caltex Riau* **1** 177
- [9] Satyaputra A and Aritonang E M 2014 *Beginning Android Programming With ADT Bundle* (Jakarta: Elex Media Komputindo)
- [10] Arif A H 2013 *24 Jam Pintar Pemrograman Android* (Yogyakarta: ANDI)
- [11] Trianto 2007 *Model Pembelajaran Terpadu dalam Teori dan Praktek* (Jakarta: Prestasi Pustaka Publisher)
- [12] Sefriani R, Wijaya I, Menrisal M and Dewi M 2020 Testing Of The Validity of Interactive Learning Module on Creative and Entrepreneurs Learning Products *Journal of Educational Science and Technology (EST)* **6** 73-78
- [13] Wijaya I and Firmansyah D 2018 Perancangan Dan Pembuatan Media Pembelajaran Berbasis Android Mata Pelajaran Teknologi Perkantoran (Studi Kasus Kelas X Otps Mk Negeri 3 Padang) *Jurnal Pti (Pendidikan Dan Teknologi Informasi) Fakultas Keguruan Ilmu Pendidikan Universitas Putra Indonesia" Yptk" Padang* **5** 9-20

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