

Android-based Learning Media Development for Computer and Basic Networking at State Vocational High School 1 Bandung Tulungagung

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ABSTRACT

This development aims to design and develop android-based learning media for Computer and Networking subjects in Class X of Computer and Network Engineering of State Vocational High School 1 Bandung Tulungagung. The development method applied in this development uses the ADDIE development model. This model has five steps, namely (1) analysis, (2) design, (3) development, (4) implementation, (5) evaluation. This android-based learning media was then tested on experts and 30 students of class XI of the Computer and Network Engineering Expertise Program at State Vocational High School 1 Bandung Tulungagung. The product produced in this development is an android-based learning media. After analyzing the data, the proportion of learning media from expert I was 82.50%, expert II was 83.33%, small group trial was 86.50%, field trial was 88.58%. The overall average percentage of expert I, expert II, small group trial, and field trial was 86.38%.

I. INTRODUCTION

The Indonesian government regulations contained in the RI Law No. 20 of 2003 article 15 reads "Types of education include general, vocational, academic, professional, vocational, religious, and special education". In accordance with these government regulations, Vocational High School is a formal education pathway with secondary education levels and types of vocational education, to prepare students to be ready to go directly into the world of work with a professional and competent attitude in accordance with their field of expertise.

Based on observations with educators, basic network subjects at SMK Negeri 1 Bandung Tulungagung have not been able to fully implement the 2013 Curriculum and are still using a one-way learning model, namely the educator explains in front of the class with material in the form of pdf files and PowerPoint slides, mostly in the form of text. learning resources used in the form of computer assembly books, and modules. The learning media cannot be used by students at any time (less practical) [1]. The availability of a library that already contains

a variety of reference books has not yet aroused students' interest in reading. In computer and basic networking subjects, in general, it discusses assembling all components into a PC and computer network traffic, but the teaching resources provided do not provide simulations according to the subject. If using existing media, students do not understand the whole computer assembly material.

In the learning process that has been carried out, students are less active and interested in having an interest in learning so that students have difficulty understanding the material that has been taught, especially for students who do not understand and are embarrassed to ask questions [2]. So that learning media is needed that supports students' understanding of the material being taught. So that the student learning process is more enthusiastic, mobile-based interactive multimedia learning media are presented. Interactive multimedia is media that combines graphic text, video, animation and sound to convey an information message through electronic media such as smartphones to achieve learning goals [3]. Learning media is one of the factors that can affect student learning outcomes, by

using learning media, material can be delivered more clearly and interestingly according to learning objectives [4]. Learning media are various types of components in the student environment that can stimulate students to learn even though they are channeling messages and can stimulate thoughts, stimulating students' willingness so that they can encourage the teaching and learning process [5].

From the existing problems, this research aims to create an android-based learning media that can attract students' interest and desire to learn so that students become active and better understand the material according to [6]. With android-based learning media, it is hoped that it can help students to more easily understand the material, carry out the learning process independently, and can improve learning outcomes according to [7]. The development of information and communication technology today makes the learning process can be done anywhere and anytime, for example android-based learning [8].

In its development, this android-based learning media will be packaged as attractively as possible so that students can linger to study a material. This Android-based learning media was created and designed using the Android studio application. Android studio is an application that is used to create android applications and can be used to create android-based learning media. The reason for making android-based learning media is that it can provide interesting and interactive presentations with real simulations and illustrations, easy to learn anywhere and anytime [9], does not require internet access to be able to use learning media. Learning media are composed of several elements including writing, pictures, videos, simulations, and quizzes to evaluate the learning process that has been carried out.

II. METHOD

This research is ADDIE model development research which has 5 stages, namely: 5 stages, namely: (1) Analyze, (2) Design, (3) Development, (4) Implementation, (5) Evaluation. The purpose of this study was to develop android-based learning media and test the feasibility of learning media. This research is descriptive, showing the steps that must be followed to produce a product. The product that will be produced in this research is Android-Based Learning Media on Basic Computer and Network Subjects at State Vocational High School 1 Bandung Tulungagung.

Development Model

This development uses the ADDIE development model. The reasons for choosing the ADDIE model in this development include 1) providing opportunities for media developers to evaluate and revise continuously in each phase that is passed so that the resulting product becomes a valid and feasible product. In addition, 2) the ADDIE model is a simple development model but its implementation is systematic. The stages of developing the ADDIE model using these five stages already cover the entire development process and are in accordance with the needs of developers needed to develop android-based learning media. This model is shown as in Fig. 1.



Fig. 1. ADDIE model development

Development Procedures

The stages carried out in this development include 1) analysis, 2) design, 3) development, 4) implementation, and 5) evaluation. In the first stage, preliminary data analysis was carried out in the form of needs analysis to determine the needs and characteristics of students, and competency analysis to determine the characteristics of subjects so that strategies and learning models could be determined that would be included in application.

In the second stage, the application design was carried out based on the results of the analysis that had previously been carried out. The planning stage includes the Android design stage which is included in the storyboard and the stage of preparing learning materials. The third stage contains concepts that have been designed at the design stage in the form of storyboards and then designed using software that can support the development of android-based learning media in the form of android studio.

The implementation stage is the stage of testing carried out by experts, small group trials, and large group trials according to Sugiyono's criteria [10]. The evaluation stage is a process to find out the learning media that has been developed already have valid criteria and are suitable for use in the learning process.

Product Testing

Product trials are carried out to find out or obtain information on the level of feasibility of the developed product, namely the Android-based computer and basic network learning media, so that the quality of the product can be accounted for. The pilot design in this development includes expert I and II expert trials, small group trials, and field trials.

The trial of expert I and expert II include product validation. Validation is carried out to determine the validity and feasibility of the developed learning media and to find out the shortcomings and potential of the product that is still not maximized in terms of the physical form or quality of the material in the learning media. The validation process was carried out by expert I and expert II.

Small group trials were carried out to find out what the media is like on a small scale. The small group trial was conducted by taking a sample. No more than 10 students of class XI of the Computer and Network Engineering program

who had taken Basic Computer and Network subjects. Field group trials were carried out to find out what the media is like on a small scale. The field group trial was conducted by taking a sample about 30 students of class XI of other Computer and Network Engineering expertise programs that were not used in the small group trial process.

The types of data used in the trial of learning media products are qualitative and quantitative data. Qualitative data in the form of criticism and suggestions given by experts and product trials through questionnaires. Quantitative data is in the form of the percentage of the questionnaire results from the assessment of the component aspects of the questionnaire so that the level of validity and feasibility of learning media can be known.

Data in the development of learning media was collected using a data instrument in the form of a questionnaire which was then given to experts and product trials were then obtained by an assessment of the questionnaire which aims to measure the completeness of the learning media that has been developed so that it is used as a basis for product revision.

The data taken in the form of qualitative and quantitative data obtained from the results of the questionnaire given to media experts, material experts, and product trials. The data analysis technique is shown by the following equation (1):

$$V = \frac{TS_e}{TS_h} \times 100\% \quad (1)$$

where v is validity score, TS_e is Total Empirical Score (validation result), and TS_h Total maximum expected score.

If the test produces a low score, a revision is made to the component. Meanwhile, qualitative data in the form of criticism and suggestions from the validator, the researcher analyzes the data by looking for errors in the product according to the criticism given by the validator.

III. RESULT AND DISCUSSION

This research resulted in the interface display as shown in Fig. 2, Fig. 3, Fig. 4, and Fig. 5.



Fig. 2. Display of Front Page Application

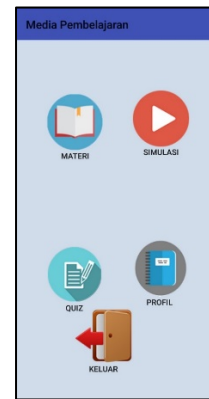


Fig. 3. Application's Menu



Fig. 4. Application's Quiz

Top Score		
Nama	nilai	date
akrom tegar	200	2018-04-15 20:10:23
Notice:	120	2018-04-15 20:10:23
Koreina kana	100	2018-07-31 07:18:57
vajar prasetya	95	2018-07-25 12:52:13
Sulistya Maharani	70	2018-09-20 22:54:10
akrom tega	50	2018-04-15 20:10:23
fajar prasetya	30	2018-07-29 19:38:43
Febri Ardiansyah16	25	2018-12-11 15:41:08

Fig. 5. Application's Score Result

Data from Expert I and Expert II Validation Results

Expert I for validation of learning media is done using a questionnaire instrument with 31 questions of questionnaire. The equation used to process the media expert validation data uses equation (1) and produces expert validation data of 82.50% which indicates that the learning media is valid and ready to be tested for feasibility. The material expert for validation of learning materials is done by using 31 questions of questionnaire. The equation used to process the validation data

is equation (1) and produces 83.33% data which indicates that the learning media is valid and ready to be tested for feasibility in small groups and in the field.

Small Group and Field Trial Results Data

After the validation of the material experts and media experts as a whole, the next step was a small group trial. In the small group trial, the respondents consisted of 10 students of class XI TKJ who had taken Basic Computer and Network subjects. The equation used to process the small group trial data is equation (1) which produces 86.50% data. These data indicate that the media is feasible to use.

Respondents in the field trial consisted of 30 students of class XI TKJ who had taken Computer and Basic Network subjects. The equation used to process data from field trials is equation (1). The results obtained are 88.58% which indicates that the media is feasible to use.

The resulting product is an android-based learning media in the subjects of Computer and Basic Network class X. The purpose of developing this learning media is to develop android-based learning media at SMK Negeri 1 Bandung Tulungagung. One of the functions of the android application in learning is as a basis for mobile learning media that makes it easier for students to learn, in which there is material and a collection of questions and evaluation materials. One of the android-based apps can be developed for learning is the e-module application or learning module [11].

IV. CONCLUSION

Based on the results of data analysis, the percentage of eligibility was obtained with an average of expert I of 82.50%, expert II of 83.33%, small group trial of 86.50% and field trial of 88.58%. The overall average percentage of the results of expert validation and testing is 86.38% with the "very feasible" eligibility criteria. From the statement above, it can be concluded that the application as a whole can be declared "very feasible".

References

[1] A. R. Annisa, A. P. Putra, and D. Dharmono, "Kepraktisan Media

Pembelajaran Daya Antibakteri Ekstrak Buah Sawo Berbasis Macromedia Flash," *Quantum J. Inov. Pendidik. Sains*, vol. 11, no. 1, p. 72, 2020, doi: 10.20527/quantum.v11i1.8204.

[2] K. P. Rahmawati, S. Djaja, and B. Suyadi, "Pengaruh Minat Belajar Dan Kecerdasan Emosional Terhadap Prestasi Belajar Siswa Kelas Xi Ips Sma Negeri 1 Prajekan Kabupaten Bondowoso Tahun Ajaran 2016/2017," *J. Pendidik. Ekon. J. Ilm. Ilmu Pendidikan, Ilmu Ekon. dan Ilmu Sos.*, vol. 11, no. 2, pp. 61–68, 2017, doi: 10.19184/jpe.v11i2.6448.

[3] N. Afitri and K. Budayawan, "Rancang Bangun Aplikasi Media Pembelajaran Sistem Komputer Berbasis Mobile," *Voteteknika (Vocational Tek. Elektron. dan Inform.)*, vol. 7, no. 3, p. 211, 2019, doi: 10.24036/voteteknika.v7i3.105547.

[4] A. A. Puspitaningrum, E. S. Wihidayat, and P. Hatta, "Pengembangan Media Pembelajaran berbasis Android pada Materi Routing Statis," *J. Ilm. Edutic*, vol. 6, no. 1, pp. 31–38, 2019, doi: 10.23887/jppp.v4i1.24782.

[5] O. J. Diamar Putra, Kuswanto Joko, "Pengembangan Media Pembelajaran Modul Interaktif Pada Mata Pelajaran PKn Kelas VII," *J. BaJET*, vol. 3, no. 2, pp. 200–206, 2019.

[6] J. Kuswanto and F. Radiansah, "Media Pembelajaran Berbasis Android Pada Mata Pelajaran Sistem Operasi Jaringan Kelas XI," *J. Media Infotama*, vol. 14, no. 1, 2018, doi: 10.37676/jmi.v14i1.467.

[7] A. P. Laksana and H. S. Hadijah, "Kemandirian belajar sebagai determinan hasil belajar siswa," *J. Pendidik. Manaj. Perkantoran*, vol. 4, no. 1, pp. 1–7, 2019, doi: 10.17509/jpm.v4i1.14949.

[8] J. Kuswanto, "Pengembangan Media Pembelajaran Berbasis Android pada Mata Pelajaran Biologi Kelas XI," *Indones. J. Bus. Intell.*, vol. 3, no. 2, pp. 65–70, 2019.

[9] A. S. Sadiman, R. Rahardjo, A. Haryono, and R. Rahardjito, *Media Pendidikan: Pengertian, Pengembangan, dan Pemanfaatannya*. Jakarta: PT Raja Grafindo Persada, 2012.

[10] Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: Alfabeta, 2016.

[11] T. Wiranda and M. Adri, "Rancang Bangun Aplikasi Modul Pembelajaran Teknologi Wan Berbasis Android," *Voteteknika (Vocational Tek. Elektron. dan Inform.)*, vol. 7, no. 4, pp. 85–92, 2019, doi: 10.24036/voteteknika.v7i4.106472.