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# Development of Android-Based Learning Media in The Subjects of Planning and Installation Video Audio System

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**Abstract**
This research aims to produce products in the form of android-based learning media that are valid, practical and effective in the subjects of Planning and Installation of Audio Video Systems. Development of android-based learning media using R&D research method with 4D development procedure (define, design, development and disseminate). The subjects in this study were students of class XII Audio Video Engineering SMK Negeri 1 Batipuh. The results showed the feasibility of android-based learning media with media expert test results obtained an average of 89% with the category "valid". Material expert test results obtained an average of 90% with the category "valid". The results of the teacher practicality questionnaire test were obtained an average of 93.85 with a "very practical" category. The results of the study of practicality questionnaires of learners were obtained an average of 88.67 with a category of "very practical". The N-Gain Score test result for the experimental class was 79.6% with the "High" category while the average N-Gain Score for the control class was 38.9% with the "Low" category. So, android-based learning media developed effectively used as a learning media in the subjects of Planning and Installation System Audio Video.

Keywords: Learning Media, Android, Planning and Installation of Audio Video Systems

## INTRODUCTION

The development of science and technology is increasingly fast that demands the field of education to always improve the quality as well as the readiness of learners in facing the challenges and needs of the world of work. In the field of employment is not only required just a diploma but also required skills and competencies in accordance with the field of experts to be entered. So the world of education must synchronize between education and the development of technology in preparing the competencies of learners who have expertise by being declared competent and can meet the classification of work competencies in the real world of work.

The use of internet access in the world of education in the current decade is said to be very necessary both in the use of the school website, UNBK and learning facilities

through the e-learning of each school. All information can be obtained easily and quickly because there are internet facilities either through PC computers, laptops, tablets, smartphones to access them while there is still an internet signal. According to detik.com, stated that in 2020 there is a 17% increase in the percentage of internet use in Indonesia from the previous year. The population of Indonesia is more than 272 million people and more than 175 million people already use the internet. If there is a comparison between the two data, then 64% of the population will be able to use internet services. With the age range of 16 years to 60s already have smart communication devices, including smartphones by 94% and mobile phones by 96%.

From the data above, the use of smartphones for internet access is quite high. This indicates that smartphone use is not only a trend or lifestyle anymore but a necessity in obtaining all information both in information exchange, sales, entertainment and learning activities easily and quickly without having to meet each other in person, either anytime, anywhere and with whom. In the world of education, smartphone use has taken one of the positions to become a teaching and learning resource known as Mobile Learning (M-Learning). With Mobile Learning does not take long and can be learned anytime and anywhere, the material is presented in a small scale that we can access while waiting for a vehicle, in the queue at the store, at work and or in the study room (Valetine, 2013:67). Thus, learning with mobile learning will stimulate curiosity and interest to learn learners and make changes from conventional learning styles to modern learning with the use of technology and make as a means of learning media.

In the midst of the Covid 19 virus pandemic, teaching and learning activities have a huge impact and influence where there is a previous deployment of face-to-face learning in the classroom, now a distance education abbreviated to PJJ in the online system. Online learning occurs at all levels of education from basic to higher education. Distance learning (PJJ) in the network in the world of education is not new, because in 2012 through Permendikbud RI No. 24 it has been mentioned that the implementation of learning in addition to face-to-face can also be carried out by remote systems utilizing various communication media. The implementation of distance education at the higher education level is regulated according to Permendikbud year 2013 number 109 while permendikbud primary and secondary education in 2014 number 119.

Media that is developing and in demand during the Covid-19 Pandemic include smartphone use, one of which is based on android. It is expected that users can access the material anywhere and anytime regarding the material being studied, which can be done repeatedly. Learning activities can still be carried out even without face-to-face. In addition, the existence of Android-based media will generate motivation and interest to learn independently because the media is created and developed interestingly both in the appearance and content of the learning media material itself.

PISAV (Video Audio System Planning and Installation) is one of the subjects included in the Vocational Interest Charge (C3) group of Audio Video Engineering expertise competencies in the curriculum structure of SMK Technology and Engineering. This subject is classified as having a large number of face-to-face hours, and contains

important competencies that will help learners in mastering materials related to video audio systems. In the learning activities are more important to practicum and skills, with the aim of providing expertise for learners concerned in planning and competently making the installation of audio video systems in accordance with the objectives of the curriculum and the demands of the real world of work.

The results of observations made from August 12 to August 17, 2019 at SMK Negeri 1 Batipuh on the competency of Audio Video Engineering expertise, that the high use of Android OS smartphones in learners is not followed by the use of smartphones as learning media and media sources by both teachers and learners. Teachers are still using old-model learning methods where the use of methods and media is still in simple discussions, once in a while using PowerPoint slides with LCD Projectors in teaching and learning activities. The use of smartphones as a learning media by teachers themselves has no competence for it because of time and ability limitations. There is no software, handbook of learners, lack of media in the form of real applications and practical equipment is not complete so that learners do not understand the material and how to apply it. The material is quite numerous and extensive while the time for face-to-face is limited so that the achievement of competence is not maximal. From the results of the latest observations that the use of Android OS smartphones in learners is not controlled, more fun to play with each smartphone during learning activities.

Looking at the problem above, the researchers created a learning media that can be used in online learning during the covid-19 pandemic with the title "Development of Android-Based Learning Media in The Subject of Planning and Installation of Video Audio System in VOCATIONAL".

## METHOD

### Types of Research

This research is classified in the type of research and development (R&D), research and development or Research and Development (R&D) is a type of research used to produce a product in the field of education aimed at improving the quality of learning (Martianingtiyas, 2019). The resulting product will be done needs analysis and effectiveness test so that this research can be implemented. The model suitable in this study uses 4D development model namely *Define, Design, Development, and Dissemination.* The 4-D development model is the choice of researchers because this development model has sequential steps and the ultimate goal of producing a product that is in sync with the problem conditions that have been in the background of this study. And researchers hope that with this 4-D model will be able to develop android-based *learning* media that is valid, practical and effective in enhancing the learning interest of learners.

### Research Sample

The research was conducted at SMK Negeri 1 Batipuh, Tanah Datar Regency, odd semester TP.2020/2021. Sampel in this study is class XII TAV 2 numbered 20 learners as an experimental class with the treatment of learning using android application-based *learning* media and class XII TAV 1 amounted to 18 as a control class without perlakuaan.

**Research Procedure**

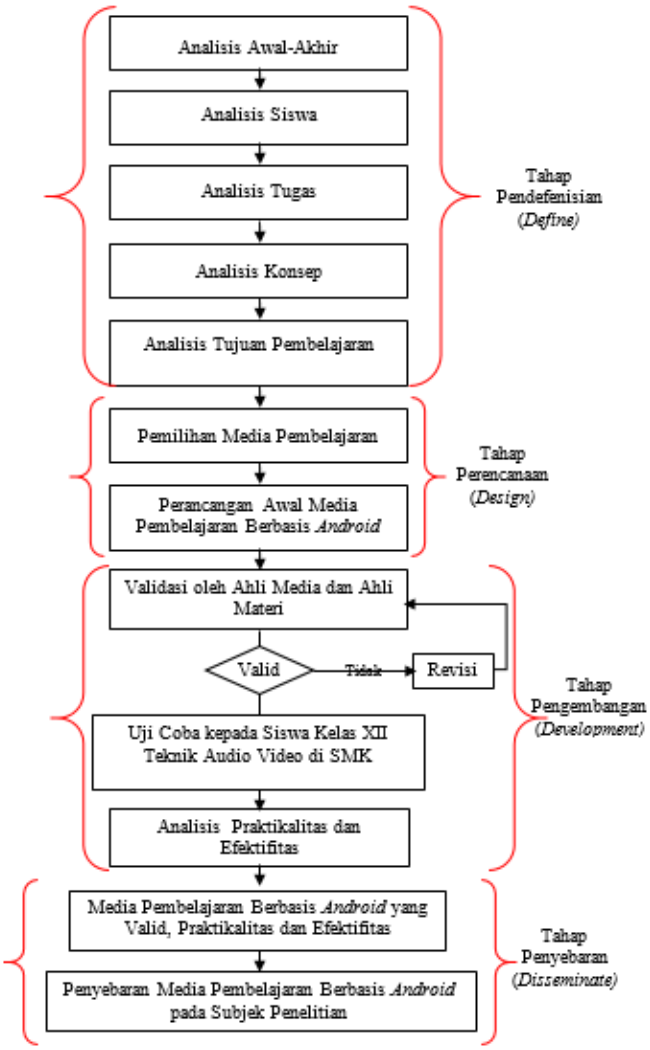


Figure 1. Research Procedure

**Data Collection Techniques**

This study used media validation questionnaires and materi, questionnaires of practicality of teachers questionnaires of practicality of learners, and *pretest and posttest questions to* find out the level of understanding and learning outcomes of learners to cable-interconnection materials, home theater installations and car audio installations.

**Learning media validation questionnaire**

For the questionnaire sheet validation learning media is intended to collect data from the assessment results of expert lecturers (validator) media and materials on android-based learning media *that* has been created from the development process. From the results of this assessment questionnaire then used as the basis for revising the learning media made. In this study involved 2 expert lecturers and 2 expert teachers as assessors of android-based learning media *validation questionnaires* that include media and material experts. From the results of this questionnaire can be analyzed and determined the feasibility of learning media products developed.

**Practicality questionnaire**

In the questionnaire the practicality of teachers and learners (users) contains an assessment of the learning media developed. Assessment is carried out, with severalindicators including components,ease of use of media, interest in media viewing, effectiveness of time and benefits of media.

**Study results test**

The test of learning results is an assessment of the theory of students in grade XII Audio Video Engineering SMK Negeri 1 Batipuh,by comparing the results of experimental class learning with the control class before the treatment (*Pretest)*and after being treated using android-based *learning* media (*Posttest)*

**Data Analysis Techniques**

In this study, using questionnaires as research instruments. Research instruments are given to testers as validators to assess product feasibility. Validation instruments that will be given in the form of questionnaires that will be filled by lecturers as media experts, material experts, and teachers to assess the validity and feasibility of android-based learning media.

Data are descriptively qualitative and quasi-qualitative. Qualitative data in the form of descriptive data obtained from validation results by experts, the results obtained are used for product revision reference. Quantitative data obtained from changing qualitative data using a likert scale with a scale of 5 (strongly agree), 4 (agree), 3 (disagree), 2 (disagree) and 1 (strongly disagree).

For validity analysis, using Aiken's formula where the data obtained from the validator is inserted into the formula so that the results of validity of the media that have been developed (Anwar, 2014:113). The formulas used are as follows;

$$V = (1)\frac{\Sigma s}{[n(c-1)]}$$

Where; s = r – Io

Io = lowest validity assessment number

c= highest validity assessment number

r= number given by the assessor

Table 1. Android-Based Learning Media Validity *Category*

| No | Achievement Level | Category |
|---|---|---|
| 1 | ≥ 0,667 – 1,00 | Valid |
| 2 | ≤ 0,667 | Tidak Valid |

Analysis of *practicality* of android-based learning media is obtained from teacher response questionnaires and student response questionnaires after using android-based learning media. The data obtained will be analyzed using the following formula (Purwanto, 2010:102)

$$NP = (2)\frac{R}{SM} \times 100$$

Where :NP= Percent value to search

R = raw score obtained

SM= ideal maximum score of the test in question

100= fixed number

Table 2. Practicality Assessment

| No | Achievement rate (%) | Category |
|---|---|---|
| 1 | 86% - 100% | SAngat Pracist |
| 2 | 76% - 85% | Practical |
| 3 | 60% - 75% | Practical Enough |
| 4 | 55% - 59% | Less Practical |
| 5 | ≤ 54% | Impractical |

Source: Purwanto (2010:103)

Android-based *learning media* that is guidedbyngkan issaid to be effective based on the learning outcomes of learners consisting of improving learningoutcomes and the completedness of learning outcomes. Classical completedness, if 85% of students in one class meet the completedness then it can be said to have fulfilled the calsiscal finish. To determine the technicality of learners using the following formula (Mulyasa, 2004:1)

$$\text{Classical Completedness} = \frac{Banyak\ peserta\ Didik\ yang\ Tuntas}{Jumlah\ Peserta\ DIdik}\ x\ 100 \qquad (3)$$

See improved learning outcomes using the N-Gain score test with the following formula

$$g = \frac{S\ post - S\ pre}{100 - S\ pre} \qquad (4)$$

Where : g = gain *score*
Post = posttest *score*
Spre = pretest *score*

The N-Gain score is an indicator to show the effectiveness of learning as seen from *the PreTest and PostTest scores of* the experiment class with the control class. The improvement of learning outcomes is categorized into three categories, namely:

Table 3. *Gain score achievement*

| *Gain Score* | *Achievement* |
|---|---|
| (< g>) > 0,7 | High |
| 0,7 > (< g>) > 0,3 | Are |
| (< g>) < 0,3 | Low |

N-Gain score in percent form (%) may refer to the following Table 4;
Table 4. N-Gain Effectiveness Interpretation Category

| Present (%) | Category |
|---|---|
| < 40 | Ineffective |
| 40 – 55 | Less Effective |
| 56 – 75 | Quite Effective |
| > 76 | Effective |

## RESULT AND DISCUSSION

### Validity of Learning Media

Learning media that will be used in learning activities should have gone through validation and have valid status through validation test. This validation test stage is carried out so that the learning media developed can be known the level of feasibility based on the assessment of media experts, material experts. If the learning media is not valid, then the revision step continues to be done to the learning media developed until it is obtained *a valid android-based*

learning media. Questionnaire validation test diisi by validator to obtain validity test data from media experts and material experts. Here are the results of the poll data from expert validity testing.

*Validity of media experts*

This media validation is done by two media expert validators and this media validation has four aspects of assessment, namely the aspects of function and performance, aspects of appearance, *aspects of software* and aspects *of usability.*

The assessment results of each aspect given validator were analyzed using Aiken's formula formula. The result obtained is a validation value to the design of the product developed. Table 5 shows the results of validation recapitulation of media aspects assessed by validators.

Table 5. Validation Results of Androis-Based Learning Media By Media Experts

| No | Aspects | Validator 1 | | Validator 2 | |
|---|---|---|---|---|---|
| | | Assessment | Category | Assessment | Category |
| 1. | Functions and Performance | 0,75 | Valid | 0,94 | Valid |
| 2. | Display | 0,75 | Valid | 0,96 | Valid |
| 3. | *Software* | 0,88 | Valid | 1,00 | Valid |
| 4. | *Usability* | 0,81 | Valid | 1,00 | Valid |
| Average | | 0,80 | Valid | 0,98 | Valid |

Based on Table 5 above shows validation results from media experts on *android-based* learning media products have a validity value of 0.80 > 0.66 by the 1st validator and a validity value of 0.98 > 0.66 given by the 2nd validator. The average rating of both media validators obtained 0.89, it can be said that *android-based learning* media on the subject of planning and installation of video audio systems belongs to a valid category.

*Validity of material experts*

Validation of this material is done oleh two expert validators of the material and validation of this material has four aspects of assessment, namely aspects of material quality, aspects of learning quality, interaction quality, and display quality.

The assessment results of each aspect given validator were analyzed using Aiken's formula. The result obtained is a validation value to the design of the product developed. In Table 6 shows the results of recaps of validation of material aspects assessed by both validators.

Table 6. Validation Results of Android-Based Learning Media By Material Experts

| No | Aspects | Validator 1 | | Validator 2 | |
|---|---|---|---|---|---|
| | | Assessment | Category | Assessment | Category |
| 1. | Material quality | 0,93 | Valid | 0,89 | Valid |
| 2. | Quality of learning | 0,95 | Valid | 0,95 | Valid |
| 3. | Quality of interaction | 0,87 | Valid | 0,94 | Valid |
| 4. | Display quality | 0,83 | Valid | 0,87 | Valid |
| Average | | 0,90 | Valid | 0,91 | Valid |

Based on Table 6 above shows result of validation from material experts on *android-based learning* media products have a validity value of 0.90 > 0.66 by the1st validator and a validity value of 0.91 > 0.66 given by the 2nd validator. The average assessment of both material validators is obtained 0.90, so it can be said that the material on *android-based*

*learning* media on the subject of planning and installation of video audio systems belongs to a valid category.

**Pre-quality Learning Media**

Practicality is the level of wearability and implementation of learning media by learners and teachers who carry out learning using revised learning media based on validator assessment.

*Teacher's Response to Android-Based Learning Media Practicality*

Practicality response questionnaires according to teachers are used to find out the opinions and assessments of educators on the implementation and ease of use of *android-based learning* media in the subjects of Video Audio System Planning and Installation.

According to (Sukardi, 2011), the questionnaire is compiled according to the components set out based on media usage covering the youthfulness of use, time efficiency, and media benefits. Practicality data was obtained through a questionnaire filled by two teachers of SMKN 1 Batipuh and SMKN 1 Lintau in the subjects of Video Audio System Planning and Installation. The results of the assessment of the questionnaire of practicality by teachers are summarized in Table 7 below.

Table 7. Teacher Response poll results

| No | Aspects | (%) | | | Category |
|---|---|---|---|---|---|
| | | R. 1 | R. 2 | Average | |
| 1. | Ease of Use Media | 90 | 93 | 91,5 | Very Practical |
| 2. | Effectiveness of time | 90 | 100 | 95 | Very Practical |
| 3. | Media Usage/Benefits | 95 | 95 | 95 | Very Practical |
| Average Teacher Response | | 91,7 | 96 | **93,85** | Very Practical |

From Table 7 shows the average practicality of teacher response is worth 93.85, it can be concluded that *the android-based learning* media fall into the category of "Very Practical".

*Learners' Response to Android-Based Learning Media Practicality*

Practicality from users also provide input in the form of responses from 20 students of SMKN 1 Batipuh. This data is obtained after the learner uses the learning media, then the learner fills out a questionnaire of practicality. The results of the assessment of the practicality of learning media by learners are shown in Table 8 below.

Table 8. Student Response Questionnaire Results

| | | % | Category |
|---|---|---|---|
| 1. | Ease of Use Media | 89 | Very Practical |
| 2. | Time | 89 | Very Practical |
| 3. | Media Usage/Benefits | 88 | Very Practical |
| Rata-Average Response of Learners | | **88,67** | Very Practical |

From Table 8 shows the average practicality of the student's response with a score of 88.67,it can be concluded that *the android-based learning* media for the learners fall into the category of "Very Practical".

**Effectiveness of Learning Media**

To find out the effective or ineffective level of *android-based learning* media in the subject of planning and installing audio video systems for the improvement of learner learning outcomes, *PreTest* and *PostTest are* carried out to experimental classes and control classes with different treatments in learning media. Experiment classes use android *apps*

while control classes use conventional learning. By looking at the learning outcomes of learners in classical and N-Gain Score test to both classes.

*Classical Completeness*

Classical completion is seen from the percentage of the number of students who complete in the experimental class and in the control class. The basis for determining the effectiveness of *android-based* learning media is the presentation of classical completeness of learners greater or equal to 85% then android-based learning media *is* effectively used. Conversely, if the learner's classic presentation is smaller than 85% android-based learning media is not effectively used. Table 9 shows the average student grades in Video Audio System Planning and Installation subjects.

Table 9. Classical Student Achievement class XII TAV

| No | Class | KKM | Percent Completeness(%) | |
|---|---|---|---|---|
| | | | *Pre Test* | *Post Test* |
| 1. | Experiment | < 75 | 15 | - |
| | (android-based learningmedia) | ≥ 75 | 85 | 100 |
| | Number of students = 20 | | | |
| 2. | Control | < 75 | 94,5 | 38,9 |
| | (conventional learning media) | ≥ 75 | 5,5 | 61,1 |
| | Number of learners = 18 | | | |

Based on the results of the analysis shown in Table 9,data obtained the number of students who completed classically in the experimental class as many as 20 learners (100%) when compared to classical completeness in the control class only 11 out of 18 learners (61.1%). This indicates classical accomplishment has been achieved. And it can be concluded that android-based *learning* media is effectively used reviewed from classical completeness.

*Test N-Gain Score*

By using the formula N-Gain score, the results of *the effectiveness* of android-based learning media based on the results of the calculation of the N-Gain score test, showed that the average value of N-Gain score for experimental classes (android-based *learning* media) is 79,633 or 79.6% belongs to the effective category. With a minimum N-Gain of 66.67% and a maximum of 94.12%. While for the average N-Gain score for control classes (conventional methods) is 38,901 or 38.9% fall into the ineffective category. With an N-Gain score of 12.77% and a maximum of 57.45%.

Thus, it can be concluded that the use of *android-based learning* media is effective to improve the learning outcomes of learners in the subjects of Video Audio System Planning and Installation in students of grade XII SMK Negeri 1 Batipuh odd semester of Lesson Year 2020/2021.

## CONCLUSION

This research has produced android-based learning media in the subjects of arrangement and the installation of a valid, practical and effective video audio system with a 4D development model in students of class XII TAV SMK Negeri 1 Batipuh.

Android-based learning media developed for teaching materials planning and installation of video audio system has been declared valid by two media experts and two material experts from the assessment results of media and material validation tests.

Android-based learning media developed for teaching materials planning and installation of video audio systems have been declared practical through trials on teachers and learners. The results of the assessment from teachers and learners on the practicality of android-based learning media stated that it is already in the category of very practical.

Teaching materials planning and installation of video audio system with android-based learning media has gone through the stage of effectiveness test through the test of learners' learning results in the form of PreTest and PostTest. That was given to the experiment class and the control class. The effectiveness level test results state that this android-based learning media is already in the effective category. Where by looking at the learning outcomes of learners in the experimental class has increased.

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