



Development of Interactive Learning Media in Basic Graphic Design Subjects for Vocational High School Students based on android

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ABSTRACT

The lack of students' understanding of the use of vectors and the lack of practice time carried out by students causes them to lack knowledge of the use of vectors in Graphic Design subjects. In addition, interactive learning media that support this is still lacking. Therefore there is a need for more exciting learning innovations to overcome this. This research aims to develop interactive learning media for Graphic Design subjects that are feasible and practical for Vocational High School students for Graphic Design subjects. The research instruments used were interview sheets and questionnaires. The sample of this research is 15 students of class X Multimedia. Analysis of research data using inferential and descriptive statistics. This research method uses the ADDIE development model consisting of 5 main steps: (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation. The research results show that the products made have been validated by 2 media experts and 2 material experts with scores of 58 and 46 or are in the good category. The results of the assessment of the responses of 15 students to interactive learning media obtained an average score of 46.77 which is included in the practical category. From these results, it can be concluded that this learning media can be used as a tool for students to learn the use of vectors in Graphic Design subjects.

Keywords: *Interactive Learning Media, ADDIE Development Model, Basic Graphic Design.*

1. INTRODUCTION

The 2013 curriculum is a curriculum that was implemented in 2013 by the government to improve the previous curriculum, namely the Education Unit Level Curriculum (KTSP). All subjects in the 2013 Curriculum use a scientific approach with the 5 M principles: observing, asking, gathering information, reasoning, and communicating. This means that learning is no longer teacher-centered; students also learn to explain and share knowledge with colleagues. The 2013 curriculum is implemented for elementary and secondary education levels. One of the SMKs that has implemented the 2013 Curriculum is SMK Negeri 5 Gorontalo.

Based on interviews with teachers of the Basic Graphic Design subject at SMK Negeri 5 Gorontalo, it was found that during the learning process, there was a lack of students' understanding of the use of vector tools and a lack of practice time during the pandemic, teachers still used the lecture method and gave assignments to students. During learning, the teacher only uses textbooks as a teaching and learning tool, making students passive

in class. So there is a need for more exciting learning innovations to activate students even though students use smartphones daily. Using smartphones as learning media provides more in-depth learning opportunities for students because by using smartphones, students can develop learning through searching for information from the internet and train their skills in carrying out practicums because of the mobility principle possessed by smartphones [1]–[4]. It is further said that using smartphones allows students to build their competencies dynamically. Therefore, developing smartphones as interactive learning media can be applied in the form of applications. One uses interactive learning media in Basic Graphic Design subjects that can be used via students' smartphones.

Learning media is a tool to assist teachers in conveying material to students so that students can understand it more easily [5]–[7]. Interactive learning media is multimedia equipped with the delivery of information and material that can be controlled and operated by the user so that the user can choose what to run first according to the selection and instructions. To

form active, creative, and independent students in solving problems given during learning activities.

Learning media is an essential factor in learning because it can make it easier for students to understand knowledge. Learning media can attract attention and motivate students in learning so that students can think and analyze the subject matter provided by the teacher properly and in fun learning situations, which can also make learning higher quality. Various kinds of learning media have their uniqueness, one of which is interactive learning media. According to Prastowo [8], interactive learning media are teaching materials combining audio, video, text, graphics, and animation learning media. Interactive media has an audio-visual element called interactive because this media is designed to involve the user's response actively.

To overcome the problems mentioned above, we need a medium in the form of learning media that is interesting and can improve the quality of learning as a supporting tool. One solution is Interactive Learning Media. We can create interactive learning media using the Android Studio application by importing files in images/animations, audio, and video and publishing programs in various formats [9][10].

This research is relevant to Novia's study [11], which developed mobile-based e-modules as interactive media to improve English proficiency, and Arina's research [7], which produced interactive e-modules to train students' visual-spatial intelligence. In this study, the subject matter used in this learning media is the Basic Graphic Design material in semester 1 (odd). Teachers can use interactive learning media as teaching aids and use students to study independently.

2. METHOD

This research design adapts the ADDIE development model, which consists of five stages or phases: Analysis, design, development, implementation, and evaluation [12]. The data used in this development research consisted of qualitative data in the form of syllabi, lesson plans, learning materials, material expert assessment questionnaires, media experts and students, pictures, and animations. The sampling technique was carried out randomly without regard to the level of the population. The sample used in this research was 15 students of class X Multimedia at SMK Negeri 5 Gorontalo.

To obtain the required data, research was conducted using the following data collection techniques: observation, interview, and questionnaire. The data analysis technique used in this study is a qualitative descriptive analysis technique, which describes product development results in the form of learning media. Data obtained through a questionnaire by media experts, material experts, and students will be converted into quantitative values.

After the data is collected, the average data acquisition will be calculated using the formula :

$$\bar{X} = \frac{\sum X}{\sum N} \quad (1)$$

Information :

\bar{X} = Average score

$\sum x$ = Total score

$\sum N$ = Number of Appraisers

Media validation was carried out by 2 media experts. The results of media validation were determined by calculating the average score of the results of the assessment of 2 media experts, which were then seen by the results based on the scoring criteria for media experts. The score criteria for the results of the media expert's assessment are as shown in Table 1.

Table 1. Criteria Results Score Assessment of Media Experts

No	Score	Grade
1.	$\bar{X} > 58.794$	Very good
2.	$47.598 < \bar{X} \leq 58.794$	Good
3.	$36.402 < \bar{X} \leq 47.598$	Enough
4.	$25.206 < \bar{X} \leq 36.402$	Bad
5.	$\bar{X} \leq 25.206$	Very bad

Material validation was carried out by 2 material experts. The results of material validation are determined by calculating the average score of the results of the assessment of 2 material experts, which is then seen by the results based on the scoring criteria for the material experts. The score criteria for the results of the expert assessment are as referred to in Table 2.

Table 2. Criteria Results Score Assessment of Material Experts

No.	Score	Grade
1.	$X > 42$	Very good
2.	$34 < X \leq 42$	Good
3.	$26 < X \leq 34$	Enough
4.	$18 < X \leq 26$	Bad
5.	$X \leq 18$	Very bad

The results of the assessment of student responses are used to determine the feasibility of the developed interactive learning media. Data from the assessment of student responses was obtained through a questionnaire which was distributed directly after students used interactive learning media. Respondents to this interactive learning media were 15 students of class X Multimedia at SMK Negeri 5 Gorontalo. Criteria Results Score Assessment Student Response as in Table 3.

Table 3. Criteria Results Score Assessment of Students Response

No.	Score	Grade
1.	$\bar{X} > 50.4$	Very good
2.	$40.8 < \bar{X} \leq 50.4$	Good
3.	$31.2 < \bar{X} \leq 40.8$	enough
4.	$2.6 < \bar{X} \leq 31.2$	Bad
5.	$\bar{X} \leq 21.6$	Very bad

3. RESULT AND DISCUSSION

3.1. Result

3.1.1. Analysis stage

At this stage, the researcher interviewed the teachers of the Basic Graphic Design subject in the class X Multimedia expertise program. The hardware and software requirements needed to design interactive learning media were also analyzed at this stage. The researchers' curriculum analysis results showed that SMK Negeri 5 Gorontalo used the 2013 curriculum. At this stage, the researchers analyzed the syllabus for Basic Graphic Design for Class X Multimedia to determine the material to be used. The material used in this study is Corel Draw application software material.

3.1.2. Design stage

The design stage is designing instructional media, which includes making the overall design (storyboard), collecting design objects, and preparing instruments for due diligence.

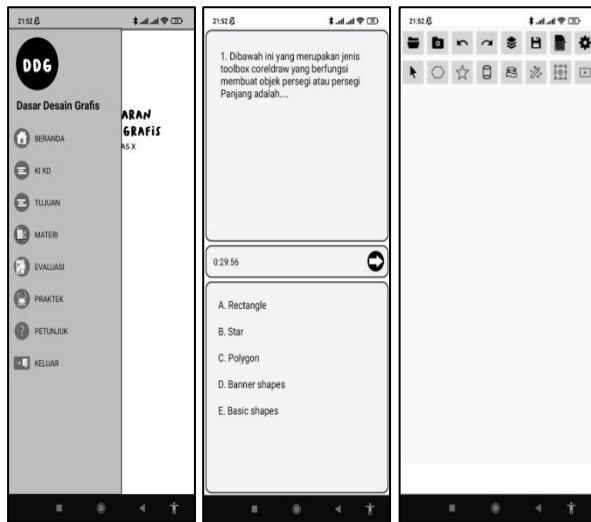


Figure 1. Storyboard design for Interactive Learning Media.

Figure 1 shows the storyboard design for interactive learning media, which consists of a menu display, evaluation display and practice material display designs.

3.1.3. Development stage

The development stage is the stage where the researcher begins to create interactive learning media by assembling all the materials/components that have been collected. This stage displays pages of interactive learning media and an explanation of each menu page, and the resulting product is published in .APK format.

Figure 2 describes the interactive learning media android application, which contains media displays, evaluation displays, and instructions for use.

a. Assessment of the results of the feasibility validation test by media experts.

The results of the feasibility validation test by media experts can be seen in table 4.

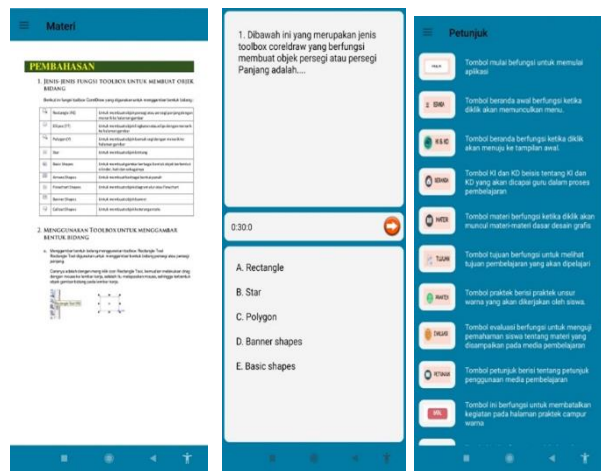


Figure 2. Android application for Interactive Learning Media.

Based on the results of the validation test by the 2 media experts above, an average score of 58 was obtained which was included in the "Good" criteria. The results of the validation test by media experts are displayed in the form of a bar chart shown in Figure 3.

Table 4. The results of the feasibility validation test by media experts.

No	Assessment Aspects	Media expert 1	Media expert 2	Total
		Score	Score	
1	Appearance	39	27	66
2	Programming	28	22	50
Avg				58
Criteria				Good

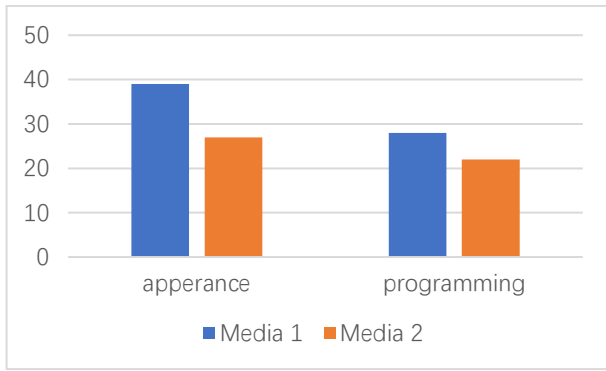


Figure 3. diagram of validation test results by media experts

b. Assessment of the results of the feasibility validation test by material experts.

The results of the feasibility validation test by material experts can be seen in table 5.

Table 5. The results of the feasibility validation test by material experts.

No	Assessment Aspects	Material expert 1	Material expert 2	Total
		Score	Score	
1	Suitability of Learning Objectives	5	5	10
2	Material Quality	24	23	47
3	Presentation of Material Content	10	8	18
4	Presentation of Self Evaluation	9	8	17
Avg				46
Criteria				Very good

Based on the results of the validation test by the 2 material experts above, an average score of 46 was obtained which was included in the "Very Good" criteria. The results of the validation test by material experts are displayed in the form of a bar chart shown in Figure 4.

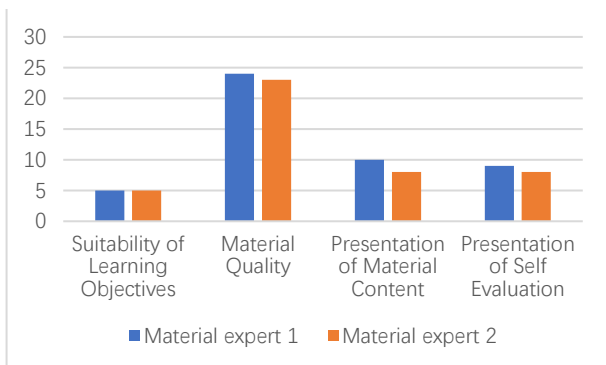


Figure 4. diagram of validation test results by material experts

3.1.4 Implementation stage

After the validation by media experts and material experts was completed, then the interactive learning media that had been developed was implemented for class X Multimedia students at SMK Negeri 5 Gorontalo, a total of 15 students. Interactive learning media created were demonstrated by researchers and run by students on their respective mobile phones. After being demonstrated and studied, students were then asked to fill out a response questionnaire which contained 12 statements in response to the interactive learning media. Student Response Validation Test Results shown in Table 6.

Table 6. Student Response Validation Test Results.

No	Assessment Aspects	Total score
1	Screen Presentation and Design	312
2	Media Accuracy and Clarity	403
Total / Avg		715 / 47.66
Criteria		Very good

3.1.5. Evaluation stage.

At this stage, an evaluation is carried out on the results of validating the eligibility of the media by media experts and material experts, as well as the results of the assessment of user responses, namely students.

a. Media Expert Validation Results

Two media experts carried out media validation. The results of media validation were determined by calculating the average score of the results of the assessment of 2 media experts, which were then seen by the results based on the scoring criteria for media experts.

The instruments used by media experts are reviewed from several aspects, namely: (1) appearance, (2) ease of program operation, (3) consistency, (4) format, (5) sound, (6) navigation, (7) benefits, (8) animation.

Based on the results of the data analysis above, it is known that the media expert's average score is 58. So, the feasibility results of the interactive learning media developed are included in the good category.

b. Material Expert Validation Results

Two material experts carried out media validation. The results of material validation are determined by calculating the average score of the results of the assessment of 2 material experts, which is then seen by the results based on the scoring criteria for the material experts.

The instruments used by material experts are reviewed from several aspects, namely: (1) Conformity of Learning Objectives, (2) Quality of Material, (3)

Presentation of Material Content and (4) Presentation of Self Evaluation

Based on the results of the data analysis above, it is known that the average score of the material expert's assessment is 46. So, the feasibility results of the material presented in the interactive learning media developed are included in the very good category.

c. Results in Feasibility Student responses

The assessment results of student responses are used to determine the feasibility of the developed interactive learning media. Data from the assessment of student responses were obtained through a questionnaire distributed directly after students used interactive learning media. Respondents to this interactive learning media were 15 students of class X Multimedia at SMK Negeri 5 Gorontalo. The instruments used to get responses from students, namely: (1) Screen Presentation and Design, (2) Media Accuracy and Clarity

Based on the results of the data analysis above, it is known that the average score of student responses is 4.8. So, the feasibility results of the interactive learning media developed according to student responses are included in the good category or practical category.

3.2. Discussion

This development research was motivated by the problems faced by teachers in the learning process of Basic Graphic Design based on the 2013 Curriculum. Namely, it was found that during the learning process, the lack of understanding of students in the use of vector tools and lack of practice time during a pandemic, the teacher still used the lecture method and gave assignments to students. During learning, the teacher only uses textbooks as a teaching and learning tool, making students passive in class.

Based on these problems, we need a medium in the form of interesting learning media that can improve the quality of learning as a means of support. One solution is Interactive Learning Media. Using the Android Studio application, we can create interactive learning media by importing files in images/animations, audio, and video and publishing programs in various formats.

The media is developed using the ADDIE development model, which consists of 5 stages to produce interactive learning media. The first stage is Analysis (Analysis). At this stage, Analysis is carried out related to needs analysis and curriculum and material Analysis. The second stage designs, at this stage, the design stage of learning media is carried out, including making the overall design (storyboard), collecting design objects, and preparing instruments for the feasibility test. The third stage is development, this stage where

interactive learning media is made by assembling all the materials/components that have been collected. The fourth stage is implementation. At this stage, the performance of interactive learning media is carried out to know students' responses to the media. The fifth stage is evaluation (evaluation). In this last stage, an evaluation of the feasibility results of interactive learning media is carried out by media experts, material experts, and students.

This interactive learning media is made using several software, namely Android Studio, Java. The development of interactive learning media is tested for feasibility by media experts and material experts before being tested on students. The results of the assessment of 2 media experts obtained an average score of 58 (good), and the results of the assessment of 2 material experts obtained an average score of 46 (Very good). The assessment results of student responses to the developed interactive learning media obtained an average score of 46.77 which is included in the good category. Based on the assessment or validation results, the interactive learning media for CorelDRAW material in the Basic Graphic Design subject is declared eligible.

This research follows related research in the literature review conducted by Zahroh et al [13], Abdullah [14], and Ismail [15] who conducted research entitled "Development of Adobe Animate CC-Based Interactive Mathematics E-Module on Social Arithmetic Materials for Class VII Middle School." The aims are to (1) describe the development process, (2) describe the results of the development, and (3) describe the test results of the development of an interactive mathematics e-module based on Adobe Animate CC on social arithmetic material for class VII SMP. The type of research used is development research, with the following development steps: (1) Define; (2) the design stage (design); (3) the developmental stage; (4) the dissemination stage. This research and development results in an interactive mathematics e-module based on Adobe Animate CC on social arithmetic material for class VII SMP. Based on the data analysis results, the developed e-module meets the valid criteria and is suitable for use.

Interactive learning media get a positive response from media experts, material experts, and students. This interactive learning media developed can be used by students for face-to-face learning directly in class or independently at home. Interactive learning media makes it easier for teachers to deliver material, giving students new insights into the learning process.

4. CONCLUSION

In Kurikulum 2013, learning is no longer teacher-centered, but students also learn to explain and share knowledge with colleagues. In the Basic Graphic Design

subject, students must be able to learn independently in solving problems in the teaching and learning process. Therefore, learning media is needed, besides being able to help students to improve their ability to solve a problem.

Interactive Learning Media uses the ADDIE development model, which consists of 5 stages. The first stage is Analysis (Analysis). At this stage, Analysis is carried out related to needs analysis and curriculum and material Analysis. The second stage design. At this stage, the design stage of learning media is carried out, which includes making the overall design (storyboard), collecting design objects, and preparing instruments for the feasibility test. The third stage is development, this stage where interactive learning media is made by assembling all the materials/components that have been collected. The fourth stage is implementation. At this stage, the implementation of interactive learning media is carried out to know students' responses to the media. The fifth stage is evaluation (evaluation). In this last stage, media experts, material experts, and students evaluate the feasibility results of interactive learning media.

The development of interactive learning media is tested for feasibility by media experts and material experts before being tested on students. The results of the assessment of 2 media experts obtained an average score of 58 (Good), and the results of the assessment of 2 material experts obtained an average score of 46 (Very Good). The assessment results of student responses to the developed interactive learning media obtained an average score of 46.77 which is included in the Good category or Practical category. Based on the assessment or validation results, the interactive learning media for CorelDRAW material in the Basic Graphic Design subject is declared eligible.

The developed interactive learning media can be used by students for face-to-face learning in class or independently at home. This interactive learning media has also been distributed to students through APK files, so that students can learn CorelDRAW material practically, anywhere, and anytime.

AUTHORS' CONTRIBUTIONS

AL, ML, planning and coordinating research activities and data analysis. SS, in charge of development, implementation and evaluation. YB, tasked with assisting in the development, implementation and evaluation of the system.

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