

Development of Interactive Multimedia based on Adobe Flash in Thematic Learning in Elementary Schools

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ABSTRACT

The purpose of this study is to produce valid interactive multimedia products on thematic learning in elementary schools. The research approach used in this research is a research and development approach (R&D) which refers to the theory of Borg and Gall. The main product trials were carried out through field trials on teachers and grade 3 elementary school students. Based on the results of the validation of the instructional media expert, it was obtained an average of 4.5 where the average was included in the valid category. Based on the results of the linguist's validation, an average of 4.0 was obtained where the average was included in the valid category. It can be concluded that interactive multimedia is valid and can be used in the field.

Keywords: interactive multimedia, thematic learning, elementary school

1. INTRODUCTION

The rapid development of technology has had a major impact on the world of education in Indonesia. Technology-based learning facilities such as computers or laptops have been found in many elementary schools so that they are very supportive of the implementation of the 2013 curriculum. The key to success that determines the success of implementing the 2013 curriculum is adequate learning facilities and resources [1].

Interactive multimedia is appropriate if used as a medium for delivering subject matter in accordance with the characteristics of the 2013 curriculum. By utilizing technology in the form of computers or laptops, interactive multimedia can provide a more effective and interactive learning experience. The characteristic of interactive multimedia is that it involves student participation in operating it so that students are more active in learning [2]–[5]. Besides, interactive multimedia can also increase student attractiveness and interest in learning because interactive multimedia combines several media elements that involve integrated text, graphics, images, photos, audio, video, and animation [6]–[9].

Interactive multimedia is chosen based on the consideration of its benefits which can attract students' interest in learning. Multimedia attracts the senses and attracts interest because it is a combination of views,

sounds, and movements. The computer research and publishing institute, namely computer technology research (CTR) states that people are only able to remember 20% of what is seen and 30% of what is heard, but people can remember 50% of what was seen and heard and 80% of what was seen, heard and done at once [10]–[12]. Learning using multimedia will be more interesting, more interactive, the amount of teaching time with lectures can be reduced, student learning attitudes and attention are improved and focused, and the quality of student learning can be more motivated [13]–[15]. Therefore, interactive multimedia is effective as a solution to the problem above. That is what encourages research to develop interactive multimedia in the form of media. The general purpose of this research and development is to produce valid interactive multimedia products on thematic learning in elementary schools. The product expected in this development research is interactive multimedia type learning media. Interactive multimedia was developed using the Adobe Flash CS 3 program and then stored on a Compact Disc (CD). This learning media is interactive because it allows students to interact with the media. Students can carry out orders to teaching media and teaching media can provide feedback to students.

2. METHOD

The research approach used in this research is a research and development approach to R&D which refers

to the theory of Borg and Gall (2003). The Borg & Gall (2003) model steps, namely: (1) research and information collection; (2) planning; (3) development of preliminary drafts of products (develop preliminary form of products); (4) preliminary field testing; (5) main product revision; (6) main field testing; (7) operational product revision; (8) product operational testing (operational field testing); (9) final product revision; and (10) dissemination and implementation (dissemination and implementation). In the process of developing the learning model in this study, the researcher modified Borg & Gall's research and development approach, namely not carrying out product dissemination due to the limitations of the research.

The steps taken to produce this multimedia product are based on the modification of Borg & Gall's (2003) development model. There are several modifications to the Borg & Gall development model, namely not using steps 8, 9, and 10 in the Borg & Gall development model because the purpose of this research and development is limited to only producing products and not reaching the wide distribution of the product (dissemination). So the details of this development model procedure are described as follows.

1) *Preliminary Study*

The needs analysis phase begins with the analysis of the 2013 class 3 curriculum textbook theme 3 "Things around me" made by the Ministry of Education and Culture. In this textbook the researcher found several shortcomings including: (1) the material in this textbook was not discussed in more depth; (2) The concept was limited because it had to be adapted to a theme and integrated with other subjects.

2) *Planning*

The planning stage is carried out to provide a complete picture related to the characteristics of the interactive multimedia products being developed, besides, this stage can be used by developers to maintain the originality of the products that have been made. This product specification relates to: (1) multimedia CD cover; (2) menus; (3) audio; (4) voice actors; (5) material; (6) written form; (7) quiz questions; and (8) instructions. use.

3) *Development of Initial Product Drafts*

Creating and Assembling (Producing) The Expected Multimedia. This stage is the stage of producing the expected production based on previous planning. The product development is using Adobe Flash CS 3 Professional software. In addition to this software, in making interactive multimedia also use other applications including. Adobe Photoshop for editing images, any video converter for changing video and audio formats. Adobe premiere pro software is used to record and edit audio. After the product is realized, the

next step is to conduct a review regarding the suitability of thematic learning steps, the correctness of the writing system, and the workings of the product components such as menus, buttons, video, audio, and quizzes.

After the initial product is realized, the next step is expert validation which will be carried out by three experts, namely: (1) material expert; (2) interactive multimedia expert; and (3) language expert and thematic learning. Then from the results of the validation, experts will receive suggestions, criticisms, and corrections, moving on from that there will be revisions.

4) *Trial of Initial Draft Products*

Revision 1 of the expert is complete, then the next stage of the initial draft of the product is tested. This trial includes a limited group trial of only 6 students to measure the level of practicality and attractiveness, with the same grid as the main product trial or field trial.

5) *Revised Main Products*

Major product revisions are based on pilot testing of initial product drafts. This revision was obtained from the results of a questionnaire filled out by students and then the trend of giving suggestions by students was sought.

6) *Trial of Main Products*

The main product trials were carried out through field trials of Class III teachers and students. To measure the level of practicality, attractiveness, and effectiveness of the product. Based on the field trial, revision 3 will be carried out based on suggestions for improvement from the teacher and Class III students.

7) *Final Revision*

This final revision is based on a trial of the main product. This revision was obtained from the results of a questionnaire filled out by the teacher and students and then the trend of giving suggestions by the students was looked for. This third revision produces the final product of development research this time, namely interactive multimedia on thematic learning that is valid, practical, effective, and interesting. The result of this final revision is the final product of this development.

3. RESULT

Interactive multimedia products developed through this study have characteristics that are suitable for grade 3 elementary school students. From the substance of the content, this interactive multimedia product supports the existence of student books that have been provided by the Ministry of Education and Culture. This interactive multimedia content is supporting material as a complement to the textbooks that have been prepared by the Ministry of Education and Culture. So that the activities in this interactive multimedia are adjusted to the thematic textbooks that have been made by the Ministry of Education and Culture. The position of interactive

multimedia media can be used to support textbooks that have been made by the Ministry of Education and Culture because the learning steps and activities in this media have been adjusted to textbooks (Figure 1, Figure 2, Figure 3).

From the substance of the structure, this interactive multimedia product includes descriptions, materials, examples/applications, questions and answer keys, games, instructions for use which are all presented audio-visual. Third, from the substance of the display, this interactive multimedia product is developed in such a way as to attract the attention of third-grade elementary school students. In addition, the development in terms of appearance also pays attention to the psychological-aspects of children aged grade III SD.



Figure 1 Instructions for Use



Figure 2 The Material in Interactive Multimedia

This interactive multimedia is equipped with instructions for teachers and students to make it easier to use. Instructions for use for teachers are arranged in print out form, instructions for teachers contain guides for teachers in carrying out learning using interactive multimedia.

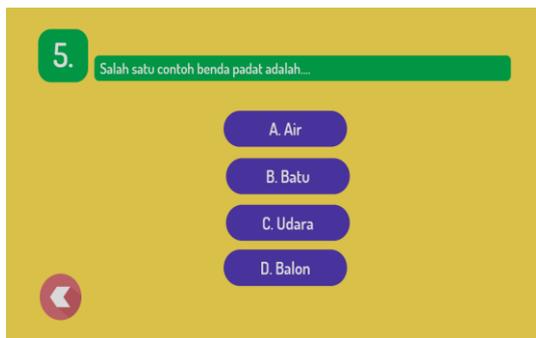


Figure 3 Quiz in Interactive Multimedia

3.1. Results of Expert Review on Learning Media

An expert review of learning media is carried out to obtain product validation and suggestions related to the suitability of the resulting product with the principle of interactive multimedia. The following is a recapitulation of the results of the media expert validation which will be described in Table 1.

Table 1 Results of the validation of learning media

No	Aspects	Score
1	Instructions for using interactive multimedia are easy to understand	4
2	The suitability of interactive multimedia with learning objectives	4
3	An interactive multimedia display according to the characteristics of elementary school students	5
4	Instructions for using the existing buttons help facilitate the user	5
5	Suitability of color selection, and background	5
6	Font selection and legibility	5
7	Image accuracy and clarity in interactive multimedia	4
8	The accuracy and clarity of animation in interactive multimedia	4
9	Video accuracy and clarity in interactive multimedia	4
10	Ease of operating the product	5
11	Keys are given accordingly to make it easier for users	4
12	Neat multimedia display	5
13	The language used is easy to understand	4
14	Interactive multimedia can create student enjoyment	4
15	The overall appearance is attractive	5
	Total Score	67

Based on table 1, data is obtained that of the fifteen statement items contained in the instrument, 7 items get a score of 5, and 8 items get a score of 4. The total score of the fifteen statement items is 67. From the total score, the average score is obtained. 4.5. The average is included in the valid category.

3.2. Results of the Linguist Review

The linguist review was conducted to obtain product validation and suggestions related to the suitability of the resulting product with the suitability of the language used in interactive multimedia. The following is a recapitulation of the results of the linguist validation which will be described in Table 2.

Based on Table 2, data is obtained that of the seven statement items contained in the instrument, 1 item gets a score of 5, 5 items get a score of 4, and 1 item gets a score of 3. The total score of the seven statement items is 28. Of the total score obtained an average of 4. The average is included in the valid category.

Table 2 Results of linguist validation

No	Aspects	Score
1	The level of clarity of the material conveyed through interactive multimedia	4
2	The suitability of the material in interactive multimedia with the needs of students	3
3	The clarity of writing on interactive multimedia shows	4
4	Selection of the right language on the material in interactive multimedia	4
5	Clarity of writing on questions in interactive multimedia	5
6	Choosing the right language on the questions in interactive multimedia	4
7	The suitability of questions supports mastery of the material	4
	Total Skor	28

3.3. Product Trial Data

Limited group trials were conducted on 5 students who were randomly selected (Figure 4). The trial was carried out during recess so as not to interfere with the teaching and learning process. The trial was carried out using 1 laptop with an alternate use. Researchers assist students in operating interactive multimedia. Students are said to be easy to operate interactive multimedia if at the time of operating this multimedia students are fluent and do not ask researchers about how to use it. Students are said to have difficulty operating this interactive multimedia if students look long in operating multimedia and often ask researchers how to use it.



Figure 4 Product trials

Based on the implementation of limited group trials, it was found that: (1) no students asked about how to use interactive multimedia to researchers; (2) the six students did not show expressions of confusion in operating interactive multimedia; and (3) students showed happy expressions when running interactive multimedia. From these data, it can be said that the five students who use interactive multimedia have no difficulty in operating interactive multimedia and students enjoy using interactive multimedia.

4. DISCUSSION

Based on the results of the validation of the instructional media experts that have been described previously, the total score of all statement items contained in the validation instrument was 67. From the total score obtained an average of 4.5. The average is included in the valid category.

Suggestions were given by instructional media experts, namely that the questions contained in interactive multimedia should be reproduced. The letter size in the questions should be bigger than the size of the answer choices. Overall, the interactive multimedia display that has been developed is interesting and can be used properly.

Based on the results of the linguist validation previously described, the total score of all statement items contained in the validation instrument was obtained, namely 28. From the total score, an average of 4.0 was obtained. The average is included in the valid category.

Suggestions given by linguists are that the letters used should be adjusted to the readability level of elementary school children. The choice of words used in the practice questions should be adapted to third-grade elementary school children. The material contained in interactive multimedia has been described briefly, concisely, and clearly. The media developed is feasible to use.

Based on the results of trials with the teacher, the results obtained from the eleven statement items contained in the instrument, 9 items got a score of 5, and 2 items got a score of 4. The total score of the eleven statement items was 53. From the total score obtained an average of 4, 8. The average is included in the practical category.

The advice is given by the teacher, among others. There are some words in the quiz that are less lettered. Overall interactive multimedia that is developed is soothing. Interactive multimedia that has been developed attract students to learn. These comments can also be proven by the enthusiasm of students in using this interactive multimedia [8], [10], [16].

Based on the implementation of trials with students, it was found that no students asked about how to use interactive multimedia to researchers. None of the students showed an expression of confusion in operating interactive multimedia. All students showed happy expressions when running interactive multimedia. From these data, it can be said that students who use interactive multimedia have no difficulty in operating interactive multimedia and students enjoy using interactive multimedia [11], [12], [14]. Some of the suggestions given by students after using interactive multimedia, namely that more questions should be added.

5. CONCLUSION

Interactive multimedia development has been implemented, validated, and tested properly. Based on the observation data during the trial, it can be concluded that students who use interactive multimedia have no difficulty in operating interactive multimedia and students enjoy using interactive multimedia.

Based on the results of the validation of the instructional media expert, it was obtained an average of 4.5 where the average was included in the valid category. Based on the results of the linguist's validation, an average of 4.0 was obtained where the average was included in the valid category. It can be concluded that interactive multimedia is valid and can be used in the field. Seeing the characteristics of this multimedia, one of which is interactive so that students can interact with multimedia, so this product can be disseminated as teaching materials that can be used by students at home.

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