Development of Interactive Learning Media Based on Adobe Flash CS 6 in Geographic Lessons

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Abstract-This study aims to determine: (1) the feasibility of interactive multimedia based on Adobe Flash CS6 on learning geography, (2) the effectiveness of the use of interactive multimedia based on Adobe Flash CS6 on learning geography. The stages of this research are the stages of needs analysis, learning media planning stages, and design. This research is a development study developed with the Dick and Carey Development Model combined with Borg and Gall, involving 72 participants randomly drawn from class X students of SMA Negeri 12 Medan. Validation questionnaires from experts were used to track the feasibility of the media and geography learning outcomes tests were developed and tested to test learning outcomes.

Data were analyzed with descriptive statistics to describe the state of the data. Requirements analysis and hypothesis testing are tested with inferential statistics. The analysis requirements with the lilliefors test are fulfilled. The development phase and the testing or validation stage. The results showed (1) the geography material expert test was very good (97.05%), (2) the learning media expert test was very good qualification (89.18%), (3) the learning design test was very good (94%) , (4) Individual tests are in very good qualifications (94.81%), (5) Small group tests are in very good qualifications (96.10%), (6) Field tests are in very good qualifications (94.81%) . The results of learning geography prove that there is a significant difference between using interactive multimedia based on Adobe Flash CS6 and power point. Shown with the results 31.08 > 26.58, α = 0.05. The results of hypothesis testing prove that there are significant differences, this is indicated by the results of data processing t_{count} = 4.57 at the significance level = 0.05 t_{table} = 2.75. It was concluded that interactive multimedia based on Adobe Flash CS6 developed was feasible and effective to improve learning outcomes in geography.

Keywords: Learning Outcomes, Interactive Multimedia Adobe Flash CS6

I. INTRODUCTION

Human Resources (HR) has a very important role in national development in all fields. Quality human resources will determine the success of national development. To get quality human resources done with good education. So education becomes a very important factor in the national development of every nation including the Indonesian nation. Myers et.al (1965) in Soedijarto (1998: 110) states that the role of HR capabilities is described so important in the development of HR in a country. The process of teaching and learning or often termed learning is a process of interaction and communication between the teacher and students. As stated by Braskamp et al (1984) learning is related to learners who learn and provide conditions to facilitate learning. So that in learning, the presence of teachers can facilitate students in conducting learning activities and achieve optimal results. Gage (1978) states that learning is a person's activity to facilitate learning of others. Teachers or adults manage activities with the aim that students can learn well. As also stated by Leighbody and Kidd (1968) that learning is helping others to learn. Thus the teacher needs to plan a learning experience that students must master so that they can immediately master the skills and knowledge desired. This understanding shows that trial and error efforts that are randomly carried out by students need not be done because they are not effective. The opinion of Braskamp, Gage, and Leighbody and Kidd above explained that learning is an activity carried out by the teacher to facilitate students to learn and make progress in skills and knowledge.

Geography lessons aim to develop students' understanding of spatial organization, society, places, and the environment on the face of the earth (Sumaatmadja, 1996: 32). Through Geography lessons, students are encouraged to be able to understand the physical processes that shape the patterns of the earth's surface, ecological characteristics and spatial distribution on earth, so that students are expected to understand that humans create regions to simplify the complexity of the earth.

With the development of information technology in the world of education today, learning geography needs to utilize existing information technology, namely by utilizing computer technology to create and present subject matter. One of the learning media developed at this time and can be used by teachers in the learning process is an interactive learning media that can be classified into multimedia. According to

Handoyo (2003) "multimedia is the presentation of information in the form of text, images and sound together (integrated) so that it becomes effective and efficient". Interactive learning media includes a variety of media integrated into one. Each component of the media can stimulate one or more human senses.

Based on the results of interviews with teachers in the field of geography studies at SMA Negeri 12 Medan, there are several factors that cause the learning process of students to be often constrained. These factors include each student having different material absorption abilities. Learning activities are still not optimal because teachers tend to dominate learning with lectures and direct learning so students are passive in learning, teachers still use conventional or printed teaching materials, sourced from teaching materials or textbooks only, not using multimedia. For this reason, teachers must be sensitive to be able to direct their students according to the abilities, interests and talents possessed by students so that the potential within students can be developed optimally. The application of media for learning is not optimal, some learning materials still do not have media for learning. With the right learning media, students can be more focused in the learning process. In this modern era, learning media has become an important component in learning. Based on the results of discussions with the geography subject teacher, with the subject of Atmosphere, students revealed experiencing obstacles in the material that have their own difficulty levels for students, and the absence of interactive learning media used on the subject of the Atmosphere, then students also assumed that geography lessons difficult to understand, which tends to be less attractive. The same thing was expressed by teachers in the field of geography studies there are still many students who have difficulty in understanding the material, so teachers must explain the material many times.

Interactive learning media has many advantages such as presenting information in the form of text, images, and sounds simultaneously. Sadiman (2011) states that there are 4 (four) benefits of teaching interactive media, namely: (1) to clarify the presentation of messages so that they are not too verbalistic, (2) overcoming the limitations of space, time, and sense power, (3) can overcome the passive nature students, and (4) make it easier for teachers to convey the contents of the subject matter ". Through interactive learning media, teachers in delivering subject matter are expected to be clearer and easier for students to understand. The teacher no longer needs to convey all the subject matter through lectures, but the teacher is assigned as a facilitator in solving problems of learning difficulties experienced by students.

From this explanation, the presence of interactive learning media in schools today, is a useful thing for the learning process. Opinions on the effectiveness of the use of interactive media in the learning process in class are also stated by Dwiyono (2009) "The effectiveness of learning occurs because students can see various forms of data both images, texts, sounds, movements and demonstrations regarding the procedures for implementing tune-up, thus enabling students to master more material lesson".

The development of computer technology, especially in the field of software is very supportive in its application as a medium of learning. With computers can be presented learning media that contains learning material textually, audio and visuals. One of the software that supports in developing interactive learning media is Adobe Flash CS6. Akbar (2008) explains: "Adobe Flash CS6 is a software specifically designed by Adobe and a standard application program for professional authoring tools used to create very interesting animations and bitmaps for building interactive and dynamic web sites. Adobe Flash CS6 provides a variety of features that will greatly help animators to make animations easier and more interesting. Adobe Flash CS6 has been able to create and process text and objects with three-dimensional effects, so the results look more interesting. Based on the features and conveniences offered by Adobe Flash CS6, it can support its application as a learning media developer in the form of interactive media.

Seeing the reality that has been described, the need for an interesting, more interactive, effective and easy-to-use learning media for geography in high school. The development of interactive media is expected to help teachers explain various subject matter discussions, so that teachers no longer rely solely on existing textbooks. The students, as recipients of the subject matter, will find it easier to understand the material presented. For this reason, one application that can be used to design an interactive multimedia-based learning media is Adobe Flash CS6 to improve the quality of geography learning.

II. METHOD

This research uses the Research and Development (R&D) method. It was said so because the research product offered was in the form of developing interactive learning multimedia based on Adobe Flash CS6 in geography learning. Gall, Gall and Borg (2003: 569) say that development research is characterized by the presence of products and research procedures that can be systematically tested, validated / evaluated, and improved until the product produced meets several criteria including effectiveness, quality, and standards raw. For this reason, in this research and development, products in the form of interactive learning multimedia based on Adobe Flash CS6 will be tested for their feasibility and effectiveness.

This study will use the research and development model (Reasearch and Development) from Borg and Gall (2003) combined with the instructional development model from Dick and Carey (2001). This learning product development model is a model that is programmed in a systematic order and meets the characteristics of students in learning. In the research and development model of Borg and Gall there are ten steps: (1) research and data collection, (2) planning, (3) initial product development, (4) initial field trials, (5) revision

of trial results initial field, (6) main field trial, (7) product revision of main field trial results, (8) operational field test, (9) improvement of the final product, and (10) dissemination and implementation.

This research was carried out in Medan 12 Public High School, located at Jalan Cempaka No.75, Kel. Central Helevetia, Kec. Medan Helvetia, Medan 2018/2019 school year even semester. The population in testing the effectiveness of development products is all students of class X IS 12 Public High School Medan. Samples will be taken from the population where Class X IS 1 is a class that will be given learning by using interactive learning media based on Adobe Flash CS6 and Class X IS 2 which will be given learning by using Power Point presentation media.

Analysis of the data in this study used quantitative descriptive analysis. All data will be analyzed with descriptive statistical techniques that are quantitatively separated by categories to sharpen the judgment in drawing conclusions. Qualitative data in the form of the statement "Very Poor, Poor, Moderate, Good and Very Good" is converted into quantitative data with a value scale of 1 to 5. The results will be averaged and used to assess the quality of the learning courseware developed. The courseware criteria will be converted into values on a scale of five using a Likert Scale which is analyzed descriptively with the percentage formula as follows:

Percentage = (number of scores obtained) / (ideal number of scores for all items) x 100%

Determination of the eligibility criteria for developed interactive media products is presented in Table 1.

Table 1. Product Eligibility Level Criteria

Percentage (%)	Criteria
0 – 20	Very Poor (Not Eligible)
21 – 40	Poor (Not Eligible)
41 – 60	Fair (Fair Enough)
61 – 80	Good (Decent)
81 – 100	Very Good (Very Decent)

According to the expert on the quality of Interactive Flash learning media based on Adobe Flash CS6 from the aspect of the quality of learning materials worth 7.76 which is in the range of very good criteria (97.05%) which means "worth to use".

2) Media Expert Validation Results

For the effectiveness test, a two-party test formula will be used:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{s\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$
(Sudjana, 2005:239)

Before conducting the t test, it was carried out through several requirements tests which included: (1) data normality test with lilliefors technique, and (2) data homogeneity test with fisher test. Research hypotheses to be tested are:

Ho = There is no difference in the geography learning outcomes of students taught with Adobe Flash CS6-based interactive learning media with students taught with Power Point presentation media.

Ha = There is a difference in the learning outcomes of students who are taught by the interactive learning media based on Adobe Flash CS6 and students who are taught with Power Point presentation media.

III. RESULTS

Based on product validation through a series of trials and revisions that have been carried out, the Interactive learning media based on Adobe Flash CS6 already has a valid status. The trial is carried out in 4 stages, namely: (1) evaluation of material experts in learning design experts, and learning media experts, (2) individual trials, (3) small group trials, and (4) field trials.

1) Material Expert Validation Results

The material expert's validation of the development of Adobe Flash CS6-based Interactive learning media was carried out by two experts on this learning material. The assessment is carried out to obtain information that is used to improve the quality of Interactive learning media based on Adobe Flash CS6, especially in Geography learning.

TABLE 1. EXPERT ASSESSMENT SCORES FOR LEARNING MATERIALS

No	Aspect	Reviewer		Score	Average	Percentage (%)	Remarks
		1	2				
1	Content Feasibility	42	43	85	7,73	96,59	Very Good
2	Presentation Feasibility	39	39	78	7,80	97,50	Very Good
	Average Total Score				7,76	97,05	Very Good

The validation of learning media experts was carried out by two instructors of learning media. Learning media experts validate the product aspects of learning media including the design of instructional media consisting of covers, media layout, use of letters, and illustrations in images. While the design aspects of Interactive learning media content based on Adobe Flash CS6 based on Adobe Flash CS6 consisting of

elements of layout, typography of letters and image   illustrations.

Table 2. Learning Media Expert Rating Score

NO	Aspect	Reviewer 1	Reviewer 2	Score	Average	Percentage (%)	Remarks
1	Media Design	34	30	64	7,11	88,89	Very Good
2	Media Content Design	64	72	136	7,16	89,47	Very Good
Average Total Score					7,13	89,18	Very Good

According to learning media experts the quality of Adobe Flash CS6-based Interactive learning media from the aspect of media skin design and media content design is worth 7.13 which falls within the range of criteria "worth testing after being corrected". The percentage of total scores from learning media experts was 8.18% which was included in the "Very Good" category.

3) Learning Design Expert Validation Results

The validation of the learning design expert was carried out by two learning design experts. The learning design expert validates the product aspects of learning design including aspects of the attractiveness of physical appearance consisting of the attractiveness of colors in the media, proportional (layout of text and images), aspects of accuracy in the use of design consisting of the accuracy of topic selection, compatibility of material with learning indicators, aspects of format suitability consisting of format conformity, aspects of presentation with target characteristics consisting of clarity of material description in the media, clarity of examples given in learning media, use of new information, aspects of clarity of media instructions consisting of the use of instructions in instructional media, explanation of terms on the media, the use of texts, the ease of learning media, the clarity aspects of the material consisting of the material presented, the relevant material, and the suitability aspect of the evaluation with the material consisting of exercises and questions.

TABLE 3. LEARNING DESIGN EXPERT ASSESSMENT SCORES

No	Aspect	Reviewer 1	Reviewer 2	Score	Average	Percentage (%)	Keterangan
1	Winning Physical Appearance	15	14	29	7,25	91	Very Good
2	Appropriate Design	24	23	47	7,83	98	Very Good
3	Conformance Format	4	4	8	8,00	100	Very Good
4	Dishes with Goal Cataracts	12	12	24	8,00	100	Very Good
5	Clarity of Media Guidance	22	20	42	7,00	88	Very Good
6	Clarity of Material Exposure	12	12	24	8,00	100	Very Good
7	Conformity Evaluation with Material	4	4	8	8,00	100	Very Good
Average Total Score					7,54	94	Very Good

According to learning design experts the quality of Geography learning media from the aspect of Adobe Flash CS6-based Interactive learning media has a value of 7.54 which is within the range of very good criteria. The percentage of total scores from learning design experts is 94% which falls into the "Very Good" category.

4) Results of Phase I Individual Trials

Individual trials conducted at 12 Public High School Medan. Individual trials were conducted on 3 students consisting of 1 high performer, 1 moderate achiever, and 1 low achiever. The purpose of this individual trial is to identify the lack of learning products after being reviewed by experts. The evaluation and input of this trial is about the presentation of learning products including the appropriateness of the content, the appropriateness of the presentation and the appropriateness of the language. The response of students in individual trials at SMA Negeri 12 Medan that this interactive learning media from the aspects of the appropriateness of the content, the appropriateness of the presentation, and the appropriateness of the language are assessed overall each includes the "Very Good" criteria of 95.81%.

Phase II Test Results for Small Group Trials

A small group trial in which Adobe Flash CS6-based Interactive learning media is implemented to 9 students in

Medan 12 High School where 3 high-achieving students, 3 moderate-achieving students, and 3 low-achieving students. This small group trial data is used as initial experience before the product is tested on the field.

Trials conducted at Medan 12 Public High School conducted by 9 students showed the percentage of total sekor was 96.10% so that it can be said that Adobe Flash CS6-based Interactive learning media from aspects of content worthiness, presentation worthiness, and language eligibility are included in the criteria " Very good".

Phase III Test Results Field Trials

Field trials are conducted after individual trials and small group trials. The field trial was carried out at SMA Negeri 12 Medan in class X students totaling 36 people. Field trials are carried out in class and each student is divided into 8 groups, where each group consists of 4 students. Each group of students uses 1 Interactive learning media based on Adobe Flash CS6. Field trials produce data that will measure the feasibility of the product being developed, and to find out the benefits of the product for its use.

The results of students in field trials in Medan 12 High School in class X semester even explained that Interactive multimedia learning media based on Adobe Flash CS6 from the aspects of the feasibility of the content, the feasibility of presentation and the appropriateness of the language in the overall value of each included in the category of "Very Good

", the percentage of the total score of all aspects is 94.81% so that if it is included in the percentage category according to Sugiyono (2011) then the validation of Interactive multimedia learning media based on Adobe Flash CS6 is categorized as" Very Good ".

Product Effectiveness Test

Data Normality Test

The data normality test is used to find out whether the data obtained is normally distributed or not. This test uses the lilliefors test formula with the criterion that the data distribution is normal if the Lhitung results <Ltable, then the data is normally distributed, otherwise if the Lhitung results> Ltable are declared abnormal. this normality is used to find out the sample used whether it comes from a normal distribution population or not. Thus there are two groups of normality tests, namely:

Group I: Learning Geography results before using Interactive multimedia based on Adobe Flash CS6

Group II: Geography learning outcomes after using Interactive multimedia based on Adobe Flash CS6

Calculation results for the significant level α = 0.05 obtained Lh values for all groups smaller than Ltable, this can be seen in the appendix. Thus it can be concluded that the learning outcomes data for all data groups I and II are from normally distributed populations.

TABLE 4. RECAPITULATION OF DATA NORMALITY TEST RESULTS

Group	Number of Samples	L_{hitung}	L_{tabel}	Conclusions
I (Without Interactive Multimedia based on Adobe Flash CS6)	36	0,011	0,147	Normal
II (With iteractive multimedia)	36	0,007	0,147	Normal

From the table above it can be seen the calculation results for student learning outcomes before using Interactive Flash based Adobe Flash CS6 multimedia conducted at SMA Negeri 12 Medan for a significant level α = 0.05 obtained a maximum Lhitug of 0.011. In the list of critical values of L for the Liliefors test with n = 36, namely Ltable = 0.886 / (√n) = 0.886 / (√36) = 0, 147 Because the value of Lhitung <Ltable, which is 0.055 <0.147, it concludes the student learning outcomes data before using Interactive Flash-based Adobe Flash CS6 multimedia that was carried out at SMA Negeri 12 Medan with normal distribution.

To conduct a homogeneity test in this study carried out using the Fischer Test. Samples have a homogeneous variance if Fhitug <F table at significant α = 0.05, calculated using the formula:

F = (greatest variance) / (smallest variance)

The amount of variance for tests that do not use Interactive Flash based Adobe Flash CS6 multimedia with n = 36 is 5.96 and the variance for tests that use multimedia with n = 36 is. 10, 27. Then Fcount in the homogeneity test is 1.72.

Determine the F table in the homogeneity test that is by db numerator = k-1 (for the largest variant) and db the mentioner

= k-1 (for the smallest variant). Then the db numerator is 36-1 = 35 and the mentioning db is 36-1 = 35 then the F table at the significance level = 0.05 is 1.78. Then Fhitug = 1.72 <F table = 1.78, the homogeneity test using the Fisher test concludes that Ho is accepted and has the conclusion that the two data groups have the same or homogeneous variants.

From the results of data processing research conducted there is an average learning outcomes of Geography after using Interactive Multimedia based on Adobe Flash CS6 in class X students of SMA Negeri 12 Medan, amounting to 31.08. While learning outcomes of Geography before using Interactive multimedia based on Adobe Flash CS6 26.58. From this data proves that Interactive Flash based Adobe Flash CS6 multimedia is feasible and effective in increasing student competence, this is in line with Kasma (2017) which states that Interactive Flash based Adobe Flash CS6 Multimedia with Adobe Flash CS6 can enhance student learning outcomes and can eliminate feelings saturation from learning. Riyana (2007) also states that Interactive multimedia based on Adobe Flash CS6 is a learning tool or tool that contains material, methods, boundaries, and ways of evaluating that are designed systematically and attractively to

achieve competencies / subcompetencies of subjects expected according to the level of complexity.

Adobe Flash CS6 based Interactive Multimedia is appropriate to use because using multimedia in the classroom is one of the good activities to encourage students to learn (Jianing, 2007). Similarly, Constantinescu (2007) stated that multimedia refers to computer-based systems that use various types of contents such as text, audio, video, graphics, animation, and interactivity and this media can improve student learning outcomes.

According to Arsyad (2011: 35) the benefits of using instructional media in the teaching and learning process are as follows: (1) Learning media can clarify the presentation of messages and information so as to facilitate and improve the process and learning outcomes. (2) Learning media can increase and direct children's attention so that it can lead to learning motivation, more direct interaction between students and their environment, and the possibility of students to learn independently according to their abilities and interests, (3) Learning media can overcome sensory limitations, space, and time, and (4) Learning media can provide students with a shared experience about the events in their environment.

From the explanation above, it can be concluded that the Interactive Multimedia based on Adobe Flash CS6 is feasible because Adobe Flash CS6-based Interactive Multimedia is compiled based on existing theories so that the learning media is feasible to be used in learning.

IV. CONCLUSION

Based on the results and discussion of interactive multimedia development research conducted, it can be concluded as follows:

Interactive multimedia with Atmospheric material is feasible to use with presentation of material validation 90.45% included in the category of "very good", validation of media experts 84.96% included in the category of "very good", validation of learning design experts 94% included in the category of "very good". Individual trials gave a presentation of 94.81% included in the "very good" category, the results of the small group trials received a presentation of 96.10% in the "very good" category and the results of the field trials obtained a percentage of 98.57% included in the "very good" category.

Student learning outcomes Geography taught by using interactive multimedia is higher than learning outcomes Student geography that is taught without interactive multimedia is tested through a statistical test t with the test results showing a price of 4.57> 2.75. Based on the results of this study also obtained data on average value of students who were taught by using interactive multimedia higher, namely 31.38 compared to the average value of students who were taught without interactive multimedia, which amounted to 26.58.

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