Development Of Interactive E-Modules Based On Animated Videos To Improve Critical Thinking Skills In History Learning Media Courses

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Abstract
This research aims to produce interactive E-Module products based on animated videos to improve critical thinking skills in history learning media courses. The target of this research is products developed /valid for use according to experts and users. The method used is the research and development method or Research &; Development (R&D). To produce the product, testing its feasibility and effectiveness is carried out in accordance with the development goals. The research was carried out in the Department of History Education with the observed modifiers, namely history education students class of 2020 as the target targets and products developed. Data collection techniques are carried out through observation, and questionnaires. With data analysis techniques with qualitative descriptive and quantitative descriptive. From the results of the research conducted, data were obtained: 1). The results of material expert validation received a value of 75 with a percentage of 93.75% in the "Very Valid" category (No Revision Needed). 2). Media Expert Validation Results get a score of 74 with a percentage of 92% in the "Very Valid" category (No Revision Required). 3). The results of the small group trial obtained a percentage score of 79.62% with an unrevised assessment. Then the results of the group trial were obtained a percentage score of 83.79% with an unrevised assessment. As well as the results of large group trials obtained a score of 85.46% with unrevised assessments. With these results, the media is declared very feasible to use.

Keywords: *Critical thinking, Development, E-module, Interactive and Video Animation.*

I. INTRODUCTION

Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and state (Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System). Therefore, the implementation of education must be carried out with careful planning and processes so that the quality of the results achieved is in accordance with learning objectives from elementary to tertiary levels.

Achieving the quality of learning in Higher Education is the professional responsibility of lecturers. In the learning process, components that play an important role in achieving learning objectives are objectives, learning materials, teaching and learning activities, methods, and learning tools and resources. This is often related to the development of science and technology that encourages lecturers to make updates in the use of technology results in the learning process. Likewise in the implementation of lectures in the History Learning Media course and one of the learning outcomes is the formation of critical thinking skills.

Research and development of animated videos for learning have been carried out at various levels of education and various fields of study such as at the elementary school level (Wisnu Adt, et al, 2021) in the field of mathematics, (Gita Permata; Zulherman, 2021) in the field of science, Junior high school level (Zakirman; Hidayati, 2017) In the field of Physics, Senior High School Level (Sultia Linika, et al, 2017) in the field of biology and (Ega Maretha, 2018) in the field of History, at the university level (Agus Susilo; Mareta Widiya, 2021). These studies show that animated videos can be used in the learning process at all levels of education and in various fields of study. Animated videos can provide inspiration for users so that they will focus more on learning.

The condition of technological development is so fast that appropriate learning media is needed for history education students as learning materials that can be used independently and accessed easily, build imagination of past events, train critical thinking skills The meaning is not only testing on aspects of memory or memorization, but testing up to aspects of analysis, synthesis, and evaluation.

One alternative solution to the problem above, researchers intend to conduct applied research by developing an Interactive E-Module Based on Animated Videos to improve critical thinking skills in the History Learning Media Course and this application can be downloaded via Google Playstore.

Theoretical Framework

A. Development of Interactive E-Modules

E-module is a form of presenting independent learning materials that are arranged systematically into certain learning units, which are presented in electronic format, where each learning activity in it is connected with a link (*link*) as navigation that makes students more interactive with the program, equipped with the presentation of video tutorials, animations and audio to enrich the learning experience (Sugihartini, 2017). So that with the use of E-modules, the quality of learning isincreasing in line with technological developments or advances.

According to Samiasih, E-module is a computer-based module and contains fragments with questions in each section to make it easier for users to understand the material (Sidiq &; Najuah, 2020). This type of module is a change from a printed module to digital or electronic form to make it more effective and quality

E-modules are now widely developed by adding interactive links so that they become Interactive e-modules. One of the criteria for interactive e-modules is self-intructional which makes the teaching materials able to teach students independently. Learning independence is given to students with the intention that students have the responsibility to regulate and discipline themselves and develop learning abilities on their own abilities. It is said to be interactive because users will experience interaction and be active, for example actively paying attention to images, paying attention to writing that varies in color or moving, animation, video, and can provide responses or feedback to content, for example in doing exercise activities.

Based on the presentation of Research and development as a research method and the presentation of Interactive E-Modules, it can be concluded that the development of Interactive E-Modules is the development of innovative learning products in the form of electronic modules inserted interactive *links* in the form of text, audio or video.

B. Animated Videos

According to Personal (2017: 137) video media is everything that allows audio signals to be combined with moving images simultaneously. Thus, video media is a medium that displays information and knowledge to students through visual and audio. Furthermore, Djamarah and Aswan Zain (2015: 124) stated that audio-visual media are media that have sound elements and image elements so that they have better capabilities than other media. Thus video media is media that has elements of image and sound in it.

Animated video is a media that contains a collection of images that are processed in such a way as to produce movement that is accompanied by audio so that it seems alive and stores learning messages. (Ega Maretha and Fajar Arianto, 2017). Animated videos are used to help teachers provide understanding to students to understand about the material being studied.

Animated videos as a learning medium in the form of moving images or live images have a relationship with learning objectives. Animated videos can increase student interest in the material which has implications for increasing student understanding (Lanto Ningrahayti, 2020)

C. Critical Thinking Skills

Critical thinking skills according to Lai Fathia Rosyida; et al, 2016) is the ability of students in analyzing arguments, making conclusions using reasoning, assessing or evaluating, and making decisions or problem solving. Critical thinking skills should be differentiated through learning at various levels of education because critical thinking skills are 21st century thinking skills that students must have (Saavedra &; Opfer, 2012) or students. The ability to think critically is very important because it can affect student learning outcomes.

These critical thinking skills are learnable and can be developed. Critical thinking skills will not develop well without a conscious effort to develop them during learning (Mauliana Wayudi; et al, 2020). Based on the view of Edwar Glaser (Sanjaya, 2019) a person can be said to have critical thinking skills, if his reasoning work and argumentation ability involve three things, namely (1) the attitude of responding to various problems, weighing various problems faced in experience and the ability to think deeply about them. This is so that a person is detached from the habit of receiving various information or conclusions without questioning them; (2) knowledge of methods of reasoning and logical inquiry; (3) skills or abilities to apply these methods (Sanjaya, 2019). One of the goals of studying history is for learners to be able to think critically.

II. METHOD

The development model used in this study is a descriptive procedural development model from Borg and Gall which consists of several steps. The first step; preliminary research (preparation, deepening survey, needs analysis), second; product development planning (data collection, identification of developed products), third; product validation and revision (expert review, small group trial and large group trial), fourth; product implementation (planning, preparation, execution, observation, evaluation).

III. RESULTS AND DISCUSSION

Product Design

At this stage there are several things done in designing interactive e-module development products based on animation videos. The development of this animated video uses a type of 2D animation using Adobe After Effect, Adobe Photoshop Express, and Filmora software.

Before conducting trials on users (in this case students), interactive e-modules based on animation videos must first be validated by material experts and media experts to correct existing deficiencies in the media. In this process, researchers get inputs on the media that has been made. The validator of this animated video-based interactive e-module was carried out by material experts by the Lecturer of History Education at State University of Medan, Mrs. Dr. Rosmaida Sinaga M. Hum, while media experts by the Lecturer of History Education at State University of Medan, Mrs. Najuah, M.Pd also included a validation questionnaire.

Material Expert Validation

Table 1.1. Material Expert Validation Results After Revision

No	Aspects	Indicators	SA	ST	MD	SD
			4	3	2	1
1	Content Eligibility	Conformity with Competency Standards (SK) and Basic Competencies (KD).	√			
		Conformity to the needs of students.	√			
		Conformity to learning objectives.	√			

		Compliance with the needs of teaching materials.	√			
		The truth of the substance of matter.		√		
		Benefits to add insight to knowledge.	√			
		Conformity with values, morality and social.		√		
2	Discussion	Readability		√		
		Clarity and coherence of the material.	√			
		) The correctness of the concept of matter.	√			
		) Compatibility of Multimedia Objects with Material.	√			
		) Conformity with Indonesian rules.	√			
		) Effective and efficient use of language.	√			
3	Video Components	) Availability of titles.		√		
		) Availability of KD or subject matter.		√		
		) The order of presentation of the material is good.	√			
		) The images presented are easy to understand.	√			
		) Pictures show the clarity of information.	√			
		) Learning Videos can be used in accordance with technological and information developments	√			
		) The accuracy of the dialogue/text of the story with the material.	√			
	SUM		**75**			

$P = \frac{\sum x}{\sum x^1}$ X 100 %

Information: P = Large Percentage

$\sum x$ = Number of validator scores (Real value)

$\sum x^1$ = Number of highest answer scores (Expected value)

$P = \frac{75}{80}$ X 100 %

$P = \frac{7.500}{80}$

P= 93,75

From the validation results from the material experts above, it can be seen that the material in the infographic media based on the animation video received a score of 64 with a percentage of 80% with the category "Very Valid" (Not Revised). Looking at the response from material experts, the infographic media based on

animation videos developed must revise the research sub-section that has been checked and in accordance with the agreement between researchers and material validation experts. The additional suggestions given are: 1). The material is too long, adjust it to the RPP used. 2). Add learning objectives in the video.

Media Expert Validation

Table 1.2. Media Expert Validation Results After Revision

No	Aspects	Indicators	SS	S	TS	STS
			4	3	2	1
1	Display and presentation	Typeface size and selection	√			
		Spacing, spacing and readability of text.	√			
		Image placement and size.		√		
		Color selection and contrast.	√			
		Layout layout demands		√		
		Placement and accuracy of video size.	√			
		Systematics of presentation		√		
		Interesting multimedia objects.	√			
		Comparison of font shape and size between titles, subtitles in proportional learning video content.		√		
2	Voice	) The attractiveness of the backsound music.	√			
		) The narrative is easy to understand.	√			
		) Clarity and speed of narration.	√			
		) Use of language	√			
3	Programming	) Easy to operate	√			
		) Supports self-study	√			
		) Can be run on various android and also computers.		√		
		) Creativity of learning animation videos.	√			
		) Effective and efficient (media, text, images, audio, graphics, animation)	√			
		) Facilitate teaching and learning activities.	√			
		) The suitability of the video length to the user's level of boredom		√		
	SUM		**74**			

$P = \frac{\sum x}{\sum x^1}$ X 100 %

Information: P = Large Percentage

$\sum x$ = Number of validator scores (Real value)

$\sum x^1$ = Number of highest answer scores (Expected value)

$P = \frac{74}{80}$ X 100 %

$P = \frac{7.400}{80} = 92,5$

The results of the media expert validation assessment of interactive e-modules based on animation videos get a score of 74 with a percentage of 92% in the "Very Valid" category (No Revision Required). Thus, the development of infographic media based on animation videos as a source of historical learning has succeeded in achieving the final goal. This can be seen from the expert response of the material to the media developed with the result that interactive e-modules based on animation videos as learning resources can / are suitable to be used as learning media.

Small Trial

This small group trial was conducted on 5 students. This stage is carried out to improve the quality of learning media that will be developed as interesting media. The results of the small group trial can be seen in table 1.3 below.

Table 1.3 Small Group Trial Percentage Results

Respondents	Total Score	Max Score	Percentage
1	89	108	82,40%
2	78	108	72,22 %
3	88	108	81,48%
4	87	108	80,55%
5	88	108	81,48%
Total	**430**	**540**	
Average			**86**
Total percentage			**79,62%**
Information			**Highly Valid**

The results of a small group trial with 5 studentsshowed that the interactive e-module based on animated videos received an overall average assessment of 86 and a large percentage of 79.62% with a very valid category (not revised). This percentage shows that the developed media can / is suitable to be used as a learning medium.

Medium Scale Trials

The assessment was conducted by 10 students with the aim of determining the response to the feasibility of interactive e-modules based on animated videos as a developed historical learning resource. The results of student responses in moderate group trials to the developed media can be seen in table 1.4 below:

Table 1.4 Percentage Results on Medium Scale Trials

Respondents	Total Score	Max Score	Percentage
1	108	108	100%
2	97	108	89,81%
3	81	108	75%
4	91	108	84,25%

5	87	108	80,55%
6	90	108	83,33%
7	86	108	79,62%
8	88	108	81,48%
9	88	108	81,48%
10	89	108	82,40%
Total	**905**	**1.080**	
Average			**90,5**
Total percentage			**83,79%**
Information			**No Revision**

The percentage of eligibility of interactive e-modules based on animated videos at the time of conducting group trials is in table 4.9 above. From the table, it can be said that the developed media received an overall average number of 90.5 and a large percentage of 83.79% with a very valid category (not revised).

Large-Scale Trials

Table 1.4 Percentage Results of Large-Scale Trials

Respondents	Total Score	Max Score	Percentage
1	93	108	86,11%
2	90	108	83,33%
3	97	108	89,81%
4	94	108	87,03%
5	86	108	79,62%
6	84	108	77,77%
7	87	108	80,55%
8	92	108	85,18%
9	90	108	83,33%
10	86	108	76,62%
11	96	108	88,88%
12	91	108	84,25%
13	101	108	93,51%
14	90	108	83,33%
15	94	108	87,03%
16	91	108	84,25%
17	92	108	85,18%
18	91	108	84,25%
19	94	108	87,03%
20	94	108	87,03%
21	91	108	84,25%
22	97	108	89,81%
23	90	108	83,33%
24	92	108	85,18%
25	93	108	86,11%
26	89	108	82,40%
27	93	108	86,11%
28	90	108	83,33%
29	96	108	88,88%
30	94	108	87,03%
31	90	108	83,33%

32	90	108	83,33%
33	97	108	89,81%
34	95	108	87,96%
35	100	108	92,59%
36	93	108	86,11%
Total	**3323**	**3888**	
Average			**92,30**
Total percentage			**85,46%**
Information			**Highly Valid**

The percentage of eligibility for interactive e-modules based on animated videos when conducting large group trials can be seen in table 4.10 above, that the media is categorized as "Eligible" with a percentage of 85.46%.

End Products

After conducting a feasibility test of the development product in the form of interactive e-modules based on animation videos as a learning resource, the results were obtained in the form of media products developed that are suitable for use in the learning process.

Mass Production

After going through the trial and repair steps, the last step of developing this animated video-based interactive e-module is mass production. Mass production is carried out by uploading the developed media to the YuoTube account so that it can be used by many people as a source / reference for learning and as a learning medium of course.

IV. CONCLUSION

After the stage of the media development process which is in accordance with the steps of the Borg and Gall development model, the results of media expert validation get a rating of 73 with a percentage value of 91.25% in the category "Very Valid" But by mutual agreement between media experts and researchers, there are inputs that must be improved, namely improvements in the title or opening. The revised results for media expert validation received a rating of 74 with a percentage of 92% value in the "Very Valid" category (No Revision Required). Thus, the development of interactive e-modules based on animation videos as a learning resource has succeeded in achieving the final goal.

Interactive E-Modules based on video tutorials practice learning models for History learning strategies courses as an innovative learning resource developed have been effectively used to improve student learning outcomes in the learning process. This can be seen from the analysis of student learning outcomes who obtained *a post-test* score of 81.04%.

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