



DEVELOPMENT OF INTERACTIVE MULTIMEDIA USE SOFTWARE MACROMEDIA DIRECTOR FOR LEARNING NATURAL KNOWLEDGE IN HIGH SCHOOL

Muhammad Fadli^{1*}, M. Yakub Iskandar², Darmansyah³, Fetri Yeni J⁴, Abna Hidayati⁵

^{1,3,4} Universitas Negeri Padang, Indonesia

² STKIP Pesisir Selatan, Indonesia

Email: muhammadfadhli@gmail.com

ABSTRACT

The learning process results in students not actively participating in the learning process and students' creativity not developing because the learning process is still oriented teacher center or teacher centered. Teachers have not fully utilized existing teaching media, including multimedia, so that learning is not interesting and enjoyable for students. This research aims to develop interactive multimedia products as valid and practical alternative learning media so that they are ready to be used in the learning process. This research is development research using the Borg & Gall model which consists of stages, namely: (1) Planning, (2) Initial Product Development, (3) Product Validation, (4) Trial and (5) Product. The research subjects consisted of four respondents, two validators for media aspects and two validators for material aspects as well as 20 students at State Junior High School 1 Lubuk Basung in Natural Sciences subjects as a test of media practicality. The product validity test results for the material aspect are in the very good category with a percentage of 95% and for the media aspect they are in the very good category with a percentage of 94.88%. The results of the product practicality test based on the 2 stages of testing that have been carried out are in the very good category with a percentage of 92.4%. The results of this research show that the overall quality of the interactive multimedia developed is in the very good category with a percentage of 94.1%. From the results of all stages of interactive multimedia development using Macromedia Director declared suitable for use in the learning process.

Keywords: Interactive Multimedia; Learning Media; Macromedia Director; Natural Sciences

*Corresponding Author:

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INTRODUCTION

Learning activities are the most basic activities in the entire educational process. This means that achieving educational goals depends a lot on how the learning process is

designed and carried out professionally. ([Warif, M., 2019., Tekege, M. 2017](#)). The IPA lesson is one part of the IPA lesson, which is a compulsory subject in school. The author sees the learning process done by the teacher is still oriented teacher center, media use is also less visible. In science subjects, it would be better if the teacher presents the material using media, so that students are more enthusiastic and happier in the teaching and learning process. ([Rahmad, F et al 2022, Susanti, ND. 2013](#)). The enthusiasm for learning arises when the learning atmosphere is fun, and learning will be more effective if students are happy. ([Darmansyah, 2010](#)). Optimal functioning of the brain neo-cortex in obtaining information (normally and creatively) the stimulus received is from the environment in a happy, calm and relaxed state, so the brain can be active and used for thinking. ([Darmansyah, 2010](#)). Teachers must convey natural science learning using fun learning media so that it can arouse students' learning motivation which in turn will achieve learning goals. ([Iskandar et al, 2023](#)). The use of multimedia is easier to remember because students' senses are more active, especially the senses of sight and hearing. Comparing the acquisition of learning outcomes through the senses of sight and hearing, approximately 90% of a person's learning outcomes are obtained from the sense of sight, 5% from the sense of hearing, and another 5% from other senses ([Arsyad, 2011: 10](#)). By using a combination of various senses, it can be supported using interactive multimedia. Interactive multimedia which contains various kinds of media in the form of images, sound, animation, navigation, video and other interesting combinations can awaken the senses and will influence student learning outcomes.

METHODS

This type of research is development research which is known as Research and Development (R&D). According to ([Sugiyono, 2009: 407](#)) research and development methods are research methods used to produce certain products and test the effectiveness of certain products. This model in interactive multimedia development research (R&D) is the model put forward by Borg and Gall ([Emzir, 2011:270](#)). Borg and Gall also suggest limiting research to a small scale, including limiting the research steps, researchers simplify these steps according to the researcher's needs into five research steps, namely:



Figure 2. Model Borg and Gall

RESULT AND DISCUSSION

Planning

Based on the current curriculum used at SMP Negeri 1 Lubuk Basung, namely the 2013 Curriculum. After the author discussed it with a material expert, namely one of the Class VIII science teachers at SMP Negeri 1 Lubuk Basung, the learning material that the author developed for the science subject is the Respiratory System, Digestive System and Blood Circulatory System. In this multimedia, the competency to be achieved with the Competency Standards is understanding various systems in human life. In class VIII students at SMP Negeri 1 Lubuk Basung, it was seen that the majority of students had difficulty understanding the learning material because of the teacher's tendency to use conventional methods in the learning process. The teacher's ability to use learning media is limited, causing a monotonous learning atmosphere. Plus, the limited availability of media from SMP 1 Lubuk Basung. Interactive Multimedia itself was developed by the author using an application *Macromedia Director MX 2004*. Interactive Multimedia is designed to be as attractive as possible and contains class VIII science learning material.

Initial Product Development

Determine Software Development

Software used for product development are Macromedia Director MX 2004, Software This application is used because the components contained in the application really support the creation of videos, animations, graphics, images, making it easier for developers to create interactive multimedia.

Develop Flowchart and Planning Storyboard

Flowchart made in such a way and adapted to the vision of form development flowchart Continue with designing storyboard with the aim that the media that will be created can be organized and in accordance with the previously determined vision and mission

Product Validation

Material Expert Validation

Material validity data was obtained from two material experts, namely Natural Science teachers who are experts in the learning material section by providing assessment sheets. Material experts study aspects of the material in interactive multimedia that has been designed. The results of the material assessment include aspects of conceptual correctness, depth of material, scarcity of material, readability, media design, and learning design which can be seen in the table below:

Table 1. Validation Mateial

Aspect	Variable Criteria	Indicator	Assessment		Indicator Average	Variable Mean
			I	II		
Material	Concept Truth	1	5	5	5	4,83
		2	5	5	5	
		3	5	4	4,5	

Aspect	Variable Criteria	Indicator	Assessment		Indicator Average	Variable Mean
			I	II		
	Depth of Material	4	4	5	4,5	4,5
		5	5	4	4,5	
		6	5	4	4,5	
		7	4	5	4,5	
	Material Completeness	8	5	5	5	5
	Legibility	9	5	4	4,5	4,75
		10	5	5	5	
	Media Design	11	5	5	5	5
	Learning Design	12	5	5	5	5
Amount			58	56	57	29,08
Rata-Rata			4,83	4,66	4,75	4,74

Media Expert Validation

Media validity data was obtained from two media experts, namely lecturers in Curriculum and Educational Technology at Padang State University who are experts in the field of interactive multimedia by providing assessment sheets. Media experts study the media aspects that exist in interactive multimedia that has been designed. The results of the media assessment include aspects of media suitability, presentation, design and convenience which can be seen in the table below:

Table 2. Validation Media

Aspect	Variable Criteria	Indicator	Assessment		Indicator Average	Variable Mean
			I	II		
Media	Media Compatibility	1	4	5	4,5	4,66
		2	5	5	5	
		3	4	5	4,5	
	Media Presentation	4	5	5	5	4,66
		5	5	4	4,5	
		6	4	5	4,5	
	Design & Layout	7	5	5	5	4,75
		8	4	4	4	
		9	5	5	5	
		10	5	5	5	
	Operational Facilities	11	4	4	4	4,5
		12	5	4	4,5	
		13	4	5	4,5	
		14	5	5	5	
		15	5	4	4,5	

Amount	69	71	73,5	18,57
Rata-Rata	4,60	4,73	4,9	4,74

Trials

Trial I

After the product is validated by material experts and media experts, the next step is to test the program on 2 respondents from class VIII students.³ at SMP Negeri 1 Lubuk Basung on Respiratory System material. The variables assessed in this product trial included aspects of appearance, material and usefulness, so the following data was obtained:

Table 3. Validation Practicality

Aspect	Variable Criteria	Indicator	Assessment		Indicator Average	Variable Mean
			I	II		
Practicality	Appearance	1	5	4	4,5	4,5
		2	5	4	4,5	
		3	4	5	4,5	
		4	4	4	4	
		5	5	5	5	
	Presentation of Material	6	5	4	4,5	4,62
		7	5	4	4,5	
		8	5	5	5	
		9	4	5	4,5	
	Expediency	10	4	5	4,5	4,5
Amount			46	45	45,5	15,6
Rata-Rata			4,60	4,50	4,55	4,55

Trial II

After the results of trial I were revised, the program was tested in trial phase II. The trial at this stage was carried out with 20 Class VIII students as respondents³ Lubuk Basung 1 Public Middle School. Product trials are carried out to see the practical aspects of the product being developed. Variables assessed in this product trial include appearance, material presentation, and convenience. The results of the trial II assessment can be seen in the table below:

Based on trials I and trials II that have been carried out, the average number of scores for the practical aspect of interactive multimedia products is 4.62 with a percentage of 92.4% in the "Very Good" category. For more details, see the table below.

Table 4. Result Practicality I and II

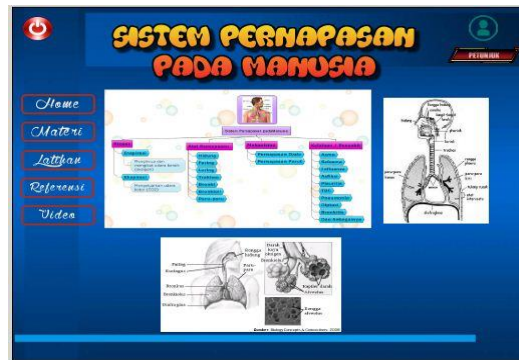
Aspect	Trials	Rata-Rata
Practicality	Trial I	4,55
	Trial II	4,69
Amount		9,24
Rata-Rata		4,62

Product

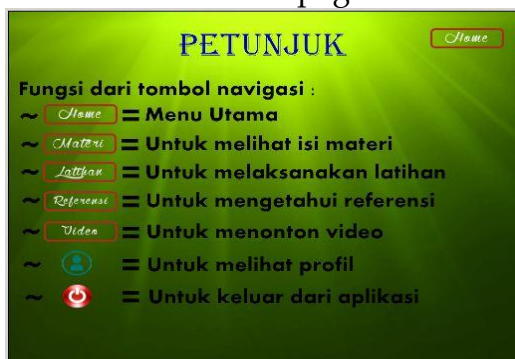
The following are the results of interactive multimedia development products using Macromedia Director software for natural science learning in secondary schools. This product meets the valid and practical criteria so that it can be used in the learning process ini figure 1 bellow:



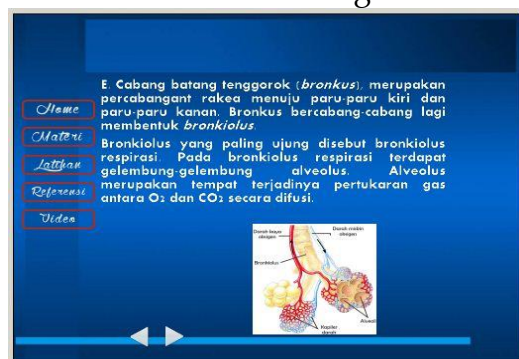
Homepage



Materials Page



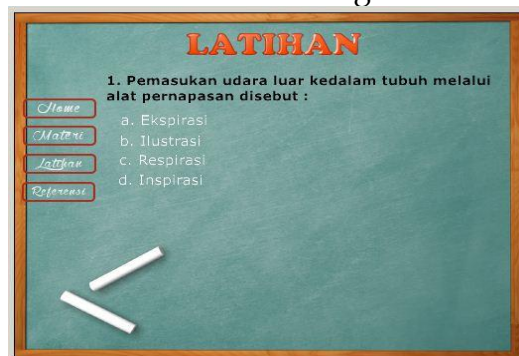
Instructions Page



Materials Page



Learning Video Page



Evaluation Page

Figure 2. Process Developing Multimedia Intercative

CONCLUSION

Appropriate learning media can be used to make students actively learn in class. The product validity test results for the material aspect are in the very good category with a percentage of 95% and for the media aspect they are in the very good category with a percentage of 94.88%. The results of the product practicality test based on the 2 stages of testing that have been carried out are in the very good category with a percentage of 92.4%. The results of this research show that the overall quality of the interactive multimedia developed is in the very good category with a percentage of 94.1%. From

the results of all stages of interactive multimedia development using Macromedia Director declared suitable for use in the learning process.

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