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Macromedia Flash Interactive Multimedia on Indonesian Cultural Diversity Material in Elementary Schools

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Abstrak

Kendala utama yang mendasari penelitian ini adalah kurangnya variasi media digital yang dimanfaatkan oleh guru dalam mengajar mata pelajaran IPAS. Penelitian ini bertujuan untuk: mengembangkan multimedia interaktif macromedia flash, menguji kelayakan pengembangan multimedia interaktif macromedia flash, dan menguji efektivitas multimedia interaktif macromedia flash dalam meningkatkan hasil belajar peserta didik pada materi keragaman budaya Indonesia. Jenis penelitian yang digunakan termasuk dalam kategori penelitian R&D (Research and Development) menggunakan model Borg and Gall. Subjek dalam penelitian ini mencakup seorang ahli dalam bidang media, ahli dalam bidang materi pembelajaran, guru dan 23 peserta didik kelas IV SD. Metode pengumpulan data dilakukan melalui metode observasi, wawancara, dokumentasi, angket, dan tes tertulis. Instrumen penelitian berupa lembar kuesioner dan soal tes. Teknik analisis data yang digunakan yaitu deskriptif kuantitatif, kualitatif, dan statistik inferensial. Hasil penelitian yaitu hasil kelayakan dari ahli media dan ahli materi, terklasifikasi sebagai "sangat layak". Uji efektivitas menggunakan uji t (paired sample t-test) menunjukkan terdapat perbedaan yang signifikan antara nilai pretest dan posttest. Hasil N-gain menunjukan perolehan nilai N-Gain sebesar 0,60 tergolong dalam kategori peningkatan "sedang". Disimpulkan bahwa multimedia interaktif macromedia flash dapat meningkatkan pembelajaran IPAS pada siswa sekolah dasar. Implikasi penelitian ini yaitu multimedia interaktif macromedia flash yang telah dikembangkan dapat digunakan dalam pembelajaran khsususnya pada materi Keragaman Budaya Indonesia di Sekolah Dasar.

Kata Kunci: *Pengembangan, Multimedia Interaktif, Macromedia Flash, Keragaman Budaya Indonesia*

Abstract

The main obstacle underlying this research is the need for teachers to use a greater variety of digital media in teaching science subjects. This research aims to develop interactive Macromedia Flash multimedia, test the feasibility of developing Macromedia Flash interactive multimedia, and test the effectiveness of Macromedia Flash interactive multimedia in improving student learning outcomes on material about Indonesian cultural diversity. The type of research used is included in the R&D (Research and Development) research category using the Borg and Gall model. The subjects in this research were an expert in the field of media, an expert in the field of learning materials, a teacher, and 23 students in class IV elementary school. Data were collected through observation, interviews, documentation, questionnaires, and written tests. The research instrument is a questionnaire sheet with test questions. The data analysis techniques used are descriptive, quantitative, qualitative, and inferential statistics. The research results, namely the media and material experts' feasibility results, were classified as "very feasible." The t-test (paired sample t-test) effectiveness test shows a significant difference between the pre-test and post-test scores. The N-gain results show that the N-gain value is 0.60, which is in the "moderate" improvement category. It was concluded that interactive multimedia (Macromedia Flash) can improve science learning for elementary school students. The implication of this research is that the interactive macromedia flash multimedia that has been developed can be used in learning, especially regarding Indonesian cultural diversity material in elementary schools.

Keywords: Development, Interactive Multimedia, Macromedia Flash, Cultural Diversity of Indonesia

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1. INTRODUCTION

Teacher quality and curriculum development have an important role in educational development. In this modern era, technological advances have also influenced the world of education, including the use of various learning media (Liao et al., 2018; Qureshi et al., 2021; Triana et al., 2021). Learning by utilizing technological developments is a challenge for teachers, especially to be more creative and innovative in delivering material so that learning feels more fun and motivates students (Ismail et al., 2021; Jannah et al., 2020; Muhtadi et al.,

2018; Santos & Castro, 2021).Therefore, teachers should develop media that can be used effectively and efficiently in learning. When using learning media, it is necessary to pay attention and consider the extent to which it is in accordance with the learning objectives (Mutiani et al., 2021; Nurhasanah, 2023).With the advancement of Information and Communication Technology (ICT) in the educational context, there has been a change in learning patterns which previously focused on the role of the teacher, now shifting to being more student-oriented (Ihsan & Saputra, 2019; Suantara et al., 2019).

However, the current problem is that there are still many learning activities that are student-oriented. Other research also states that there are still many teachers who use lecture methods which make students feel bored (Maula & Fatmawati, 2020; Purwandari & Wahyuningtyas, 2017). Other findings also reveal that the lack of learning media that facilitates students has an impact on low student learning outcomes (NNK Dewi, Kristiantari, et al., 2019; Suharsiwi et al., 2022; Udayani et al., 2021). Previous research also revealed that some teachers still have difficulty developing digital learning media that can be used by students in learning (Ni Putu Dinayusadewi et al., 2020; Roemintoyo et al., 2022). Based on observations and interviews with fourth grade teachers at SDN Salaman Mloyo, it also shows that the media used by teachers when teaching science subjects (Natural and Social Sciences), namely concrete media, includes objects in the environment. Digital media that is often used is PPT (Power Point Presentation) and videos related to material displayed using LCDs and projectors. Students feel enthusiastic when teachers use digital media, but teachers still rarely use digital media in learning. This is due to limited time to prepare digital media before it can be used, especially since teachers at school's job is not only to teach but also to take care of school administration. The lack of use of interactive and varied media causes students to feel bored.

Student learning outcomes in science and science subjects in class IV of SDN Salaman Mloyo have various categories. The daily test scores on Indonesian cultural diversity material obtained an average score of 67. Students who obtained scores in the very good category were 3 children (11%), in the good category were 5 children (19%), in the fair category were 6 children (22 %), and the category needs guidance as many as 13 children (48%). These learning results show that many students get less than optimal grades and still need guidance. This is because students feel bored and less active in learning science, especially on the subject matter of Indonesian cultural diversity because it contains a lot of reading texts and there is a lack of use of learning media by teachers.

The solution used to overcome this problem is by developing innovative digital media. Teachers need to have a variety of skills in order to improve the quality of education and create an effective and innovative learning atmosphere. The implementation of learning in the classroom should be better, especially considering the rapid development of science and technology (Arisanti & Adnan, 2021; Dinayusadewi & Agustika, 2020).In this era of globalization, there is the potential to integrate more than one type of media. The combination of several media to form complete learning media is often referred to as multimedia (Rahmi Oktarina et al., 2021; Wibowo et al., 2020). Interactive multimedia is a type of multimedia that is equipped with a controlling device that can be operated by the user. Thus, users have the ability to choose the next step according to their wishes. The use of technology in education involves the application of computer-based media using software such as Macromedia Flash (Hotimah et al., 2021; Huda & Ardi, 2021; Oktarina et al., 2021). Macromedia Flash is an application or software that can support teachers in creating interactive learning media or interacting with each other. Apart from that, Macromedia Flash has other advantages including high consistency in producing animations and images, maintaining good image quality, creating interactive programs, and ease in creating

animations, as well as other aspects (Elfina et al., 2017; Fitriana et al., 2021; Sare, Y & Budhi, 2018).

Several previous studies have also examined the need for learning media in the teaching context (Riwu et al., 2018; Siregar & Kurniati, 2022). Previous research findings state that multimedia can make it easier for students to learn (N. Dewi & Sujana, 2021; Nur Jannah, 2020). Other research also states that multimedia learning can increase students' learning motivation so that it can significantly increase students' enthusiasm for learning (Dewi, Sudatha, et al., 2019; Rofiq et al., 2019). Other research conducted related to the development of thematic learning media based on Macromedia Flash also shows that the media can improve student learning outcomes (Syabrina & Sulistyowati, 2020).Thus, it can be concluded that the application of macromedia flash-based learning media is effective in improving student learning outcomes, with the level of improvement which can be categorized as moderate. The advantages of Macromedia Flash are not only limited to its ability to create interactive learning media, but it is also able to display a variety of media, combining text, video, sound, graphics and animation. Based on the description above, the aim of this research is to develop interactive multimedia Macromedia Flash on material about Indonesian cultural diversity.

2. METHODS

This research uses research and development methods which are generally known as research and development. The Borg and Gall development model used in this research includes 10 stages (Sari et al., 2020). However, this research uses the Borg and Gall development model with eight stages, due to time and cost limitations in mass production. The development process includes steps such as potential and problems, information gathering, product design, design validation, design improvement, product testing, product revision, usage trials. At the potential and problem stage, observations and interviews were carried out as a first step to find out the potential and problems, especially in science and science learning in class IV at SDN Salaman Mloyo. At the data collection stage, the information that has been obtained is collected. At the product design stage, product development is carried out. At the design validation stage, the validity of the learning media was tested by involving several experts. At the design revision stage, the product is revised based on suggestions and input from material and media experts. At the product trial stage, the product was tested on a small scale on six class IV students at SDN Salaman Mloyo. At the product revision stage, product revisions are carried out if there are deficiencies after testing on a small scale. In the use trial, a large-scale trial of the media that has been made is carried out, namely using samples from predetermined research.

The location of this research is SDN Salaman Mloyo, Semarang City. Research subjects included lecturers who were media experts and material experts, as well as class IV teachers at SDN Salaman Mloyo. The test subjects for this research were 23 grade IV students at SDN Salaman Mloyo. The methods used to collect data are observation, interviews, documentation, questionnaires and learning outcomes tests. Observation and interview methods were used to collect data in the field. The documentation method is used to collect documentation in the form of photos and videos of research activities carried out. The questionnaire method is used to collect data in the form of assessments given by experts and teachers. The test method is used to collect data in the form of a pre-test before using the media and a post-test after using the developed media. The instruments used to collect data were questionnaire sheets and test questions. The grid of instruments used is presented in Table 1.

Table 1. The Learning Media Validation Questionnaire Grid

No.	Indicator	Score				
		1	2	3	4	5
1	Ease of use of media					
2	Clarity of instructions for use					
3	Compatibility of component layout					
4	Use of font size and type					
5	Selection of design colours					
6	Accurate use of backgrounds and animations					
7	Presentation between pages					
8	Readability and clarity of writing					
9	Suitability of illustration images with learning material					
10	Suitability of the form of illustration to the material					
11	Media design according to student characteristics					
12	Accuracy of background sound on media					
13	Use of sound effects					
14	The attractiveness of the quiz format and appearance					
15	Ease of understanding the media by teachers and students					

The techniques used in analyzing data are qualitative descriptive analysis, quantitative descriptive analysis and inferential statistics. Qualitative descriptive analysis techniques are used specifically to analyze test data from subject matter or content experts and learning media experts. This data analysis process involves grouping information from qualitative data such as input, responses, criticism and suggestions for improvement found in questionnaires and interview results. The results of this analysis are then used to make revisions to the product being developed. Meanwhile, quantitative descriptive analysis is applied to process data obtained through questionnaires in the form of scores. Trial data on the target group was collected using pre-test and post-test on the main material being tested. Inferential statistical techniques were used to analyze data in the form of the effectiveness of interactive multimedia Macromedia Flash on Indonesian cultural diversity material on student learning outcomes.

3. RESULTS AND DISCUSSION

Result

The development model applied in this research is the Borg and Gall model. Each development stage produces the following results. The First, potential and problems. In this step, potential and problems are identified through observations and interviews with class IV teachers at SDN Salaman Mloyo. The identification results show that although the school is equipped with facilities such as laptops and LCD projectors, their use is not optimal in learning activities. The existence of limited learning media causes a level of boredom felt by students. The second, gathering information. At this stage, a questionnaire is distributed to evaluate the needs of students and teachers regarding the interactive multimedia that will be produced. The results of the questionnaire show that there is a need to have learning media that is able to inspire active participation of students during the learning process. The third, product design. Researchers design interactive multimedia products using the Macromedia Flash application. In this multimedia, there are various menus, including instructions for use, learning outcomes and objectives, material concept maps, learning materials, quizzes, media developer profiles, and reference lists. The results of the development of interactive

multimedia products containing material about Indonesia's cultural diversity are presented in Figure 1.

Figure 1. The Macromedia Flash Interactive Multimedia Results

The fourth, design validation. In the validation process, products are evaluated and validated by lecturers who have expertise in media and materials. The validation results show an assessment of 89.33% from media experts and 96% from material experts. These two data indicate that the media being developed is in the "very suitable" category for use. The assessment by experts can be seen in table 2.

Table 2. The Product Validity Test Results

No.	Test Subjects	Percentage	Category
1	Media Expert	89.33%	Very Worth it
2	Material Expert	96%	Very Worth it

The fifth, design improvements. After validating the product, the next step is to revise the media based on suggestions or recommendations from the validators. Media experts suggest changes to the material menu by changing the shape of the map to be more real or realistic than previously in animated form. Apart from that, in the quiz menu, it is recommended to add a review of answers, both correct and incorrect after students answer. On the other hand, the results of filling out the questionnaire by the material expert validator do not provide advice or input on the product that has been developed.

The sixth, product trials. Product testing was carried out at SDN Salaman Mloyo involving 6 students, consisting of 2 top-ranked children, 2 middle-ranked children and 2 lower-ranked children. The learning process involves the application of interactive multimedia products that have been created. After learning is complete, teachers and students are asked to fill out a response questionnaire regarding the media that has been used. The results of the questionnaire are presented in table 3.

Table 3. The Results of Teacher and Student Responses to Macromedia Flash Interactive Multimedia

No.	Test Subjects	Percentage	Category
1	Teacher	93.33%	Very Worth it
2	Learners	98.84%	Very Worth it

Based on the data listed in table 3, it can be seen that the teacher's response reached a percentage of 93.33%, while the student's response reached a percentage of 98.84%. By referring to these two percentage figures, it can be revealed that interactive multimedia is classified as "very feasible". Seventh, product revision. This step involves taking corrective action on the media that has been created if there are suggestions from teachers and students. However, in carrying out this research, there were no suggestions for improving interactive multimedia, so that it could be continued to the trial use phase. Eighth, test use. The use trial was carried out in class IV of SDN Salaman Mloyo involving 17 students. Before starting learning using interactive multimedia Macromedia Flash, students do a pre-test. After the learning stage, students are asked to undergo a post-test to measure the effectiveness of the product. Initial data from pre-test and post-test testing results must go through prerequisite testing, namely the normality test as shown in table 4.

Table 4. The Large-Scale Data Normality Test Results

	Shapiro-Wilk		
	Statistics	**df**	**Sig.**
Pretest	0.931	17	0.226
Posttest	0.916	17	0.126

From the results of the normality test table in the wide scale trial above, it was found that the significance value (Sig.) in the pre-test was 0.226 and in the post-test it was 0.126. Sig value. This shows that based on the normality test the data tends to be normally distributed. This is due to the Sig value. in both tests it was more than 0.05. The homogeneity test results also show that the data is homogeneously distributed. The next stage is analyzing the data using the t-test presented in Table 5.

Table 5. The Paired Sample T-Test (T-Test)

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	**Std. Deviation**	**Std. Error Mean**	**95% Confidence Interval of the Difference**				
					Lower	**Upper**			
Pair 1	Pre-test Post-test	-36.471	8.35253	2.026	-40.765	-32.176	-18.003	16	0.000

From the 2-tailed significance results which reached a value of 0.000 which is lower than 0.05, it can be concluded that there is a significant difference between the pre-test and post-test scores. To identify categories of improvement between the average pre-test and post-test scores, an N-Gain analysis was carried out. The results of data analysis show that the N-Gain is 0.6091, indicating that the increase in student learning outcomes is classified in the "medium" category. So, it can be concluded that the use of interactive multimedia with the help of the Macromedia Flash application has proven to be effective in improving student learning outcomes in science and science subjects in class IV at SDN Salaman Mloyo.

Discussions

The results of data analysis show that Interactive multimedia with the help of the Macromedia Flash application is suitable for use in learning. This is caused by several

factors, namely as follows. First, interactive multimedia with the help of the Macromedia Flash application is suitable for use in learning because it can improve student learning outcomes. Interactive multimedia that uses the Macromedia Flash application is suitable for use in science and science learning in elementary schools. Learning media are the means used by teachers to convey messages or learning materials, media are used to support the achievement of learning objectives (Kristanto, 2016; Saifudin et al., 2020; DS Sari & Apriyantika, 2020).Learning can also be used to facilitate the delivery of material by teachers to students (Azizatunnisa et al., 2022; Kristanto, 2016; Nurhasanah, 2023; Saifudin et al., 2020; Sari & Apriyantika, 2020). Without media involvement in the teaching and learning process, communication in this situation will fail, causing the delivery of material by teachers or lecturers to students or students not to be carried out optimally (Nurhasanah, 2023; Oktafiani et al., 2020). The resulting interactive multimedia has the advantage of being able to stimulate student involvement so that it can improve students' science learning outcomes. Other advantages include the implementation of creative and innovative learning in accordance with technological developments so that this media is practical and easy to access.

Second, interactive multimedia with the help of the Macromedia Flash application is suitable for use in learning because it motivates students to learn. In an effort to create an engaging learning experience for elementary school students, screen displays, text, images, animations and background sound were carefully selected. The use of animation is implemented with the aim of making students actively involved in learning activities (Anggraeni et al., 2021; Ilmiani et al., 2020; Nurhasanah, 2023; Oktafiani et al., 2020). The use of interactive multimedia has succeeded in increasing interest in learning, student involvement in the learning process, and effective understanding of concepts (Waruwu & Sitinjak, 2022; Wulandari & Ambara, 2021). Positive responses from students and teachers towards the development of interactive multimedia Macromedia Flash can also be seen in the results of teacher and student response questionnaires. The quality of the media that has been developed can be evaluated through the material aspect, which is proven to be very good because interactive multimedia presents the concepts of IPAS material correctly and clearly. Apart from that, the material is appropriate to the learning outcomes and objectives. The use of language in the products developed is in accordance with the level of cognitive mastery of students.

Third, interactive multimedia with the help of the Macromedia Flash application is suitable for use in learning because it creates a fun learning atmosphere. The interactive multimedia design aspects developed include the arrangement of visual elements, colors and text to produce interesting combinations. Interactive multimedia is able to present lesson material in an interesting manner according to the needs and characteristics of students at the elementary school level (Anggraeni et al., 2021; Kristanto, 2016; Saifudin et al., 2020; Sanusi et al., 2015; DS Sari & Apriyantika, 2020). The initial menu display on interactive multimedia also succeeds in depicting the essence of the entire content. Macromedia Flash can be a learning tool that can be accessed both online and offline. Therefore, learning material can be studied repeatedly without the need to use internet quota (Adelia & Mustika, 2023; Sahari & Wahyudi, 2020). Utilizing Macromedia Flash software can create learning media that combines images, sound, animation and various types of text (Adelia & Mustika, 2023).An attractive appearance and easy to understand use make the Macromedia Flash application an effective medium to use. It can display writing, images, audio and animation so that it can arouse students' interest in learning (Adelia & Mustika, 2023; Rahmayona et al., 2022).. The existence of this application can make students interested in participating in the learning process (Ayunda & Fitria, 2022).

This development research is in accordance with other research findings which show that interactive multimedia as a learning medium is worthy of expanding its development. Previous research states that learning multimedia is suitable for use because of its ability to combine text, images, audio, music, animation, or video in one unit that supports each other, aimed at achieving learning goals (Elfina et al., 2017; Fitriana et al., 2021; Sare, Y & Budhi, 2018). Other research also states that multimedia learning can increase student enthusiasm and learning outcomes effectively (Harefa et al., 2020; Rahmi Oktarina et al., 2021).These findings are based on the ability of interactive multimedia to be effective in improving student learning outcomes in elementary schools (Sintya et al., 2020).Further research regarding media development using the Macromedia Flash application is considered valid, practical and effective for use as a learning tool in class IV (Vikiantika et al., 2021).It can be concluded that interactive multimedia with the help of the Macromedia Flash application is suitable for use in learning. The advantage of this media is that it increases student motivation throughout the teaching and learning process, supporting the achievement of the desired learning goals. The limitation of this research is that the material only covers the diversity of Indonesian culture. Therefore, further development efforts are needed by other researchers, especially in the context of using learning media for different science material. The implication of this research is that interactive multimedia with the help of the Macromedia Flash application developed can be used in science and technology learning activities.

4. CONCLUSION

Based on assessments from media experts and learning material experts, it was concluded that interactive multimedia using Macromedia Flash was worthy of development in the "very feasible" category. After carrying out the N-Gain test and the effectiveness test using the T-test. The results show that the interactive multimedia Macromedia Flash is effectively used to improve the learning outcomes of class IV students in science subjects, especially material on Indonesian cultural diversity. It is concluded that interactive multimedia, with the help of the Macromedia Flash application, can improve elementary school science and science learning outcomes.

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