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Development of Android-Based Interactive Multimedia On Thematic Learning

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Abstract

This research and development were conducted at SD Madrasah Ibtidaiyah Muhammadiyah using the ADDIE development model. The model consists of analysis, design, development, implementation, and evaluation stages. The result of this research is an interactive multimedia product based on the Android platform for thematic learning, specifically focusing on the subject of national historical events during the colonial era, intended for elementary school fifth-grade students with a focus on the Social Studies subject.

The interactive multimedia based on Android was developed using Unity and Photoshop applications, incorporating text, images, and sound components. This multimedia can be downloaded and installed on Android-based smartphones. The product testing results showed that the validation by media experts reached 85.30%, while the validation by subject matter experts reached 95.45%. The average of these two validations falls into the category of highly valid. The effectiveness test through evaluation questions yielded a result of 96.24%, which falls into the category of highly effective and achieved a high level of completion. The practicality test obtained a percentage of 96.7% from teachers and 96.30% from students, which falls into the category of highly practical. The attractiveness test yielded a percentage of 96.72% from students, also falling into the category of highly attractive.

Therefore, based on the above presentation, it can be concluded that the interactive multimedia based on Android for thematic learning on the topic of national historical events during the colonial era is suitable for use in elementary school fifth-grade students. This product meets the criteria of being valid, effective, practical, and attractive.

Keywords: Interactive Multimedia, Android, Thematic

Abstrak

Penelitian dan pengembangan ini dilakukan di SD Madrasah Ibtidaiyah Muhammadiyah dengan menerapkan model pengembangan ADDIE. Model tersebut terdiri dari tahapan analisis, perancangan, pengembangan, implementasi, dan evaluasi. Hasil dari penelitian ini adalah sebuah produk multimedia interaktif berbasis android untuk pembelajaran tematik, khususnya materi peristiwa kebangsaan masa penjajahan, yang ditujukan bagi siswa kelas V sekolah dasar dengan fokus pada mata pelajaran IPS.

Multimedia interaktif berbasis android yang dikembangkan menggunakan aplikasi Unity dan Photoshop, yang mencakup komponen teks, gambar, dan suara. Multimedia interaktif ini dapat diunduh dan diinstal melalui perangkat smartphone berbasis android. Hasil dari uji coba produk menunjukkan bahwa validasi dari ahli media mencapai 85,30%, sementara validasi dari ahli materi mencapai 95,45%. Rata-rata hasil kedua validasi tersebut termasuk dalam kategori sangat valid. Uji coba keefektifan melalui soal evaluasi menunjukkan hasil sebesar 96,24%, yang termasuk dalam kategori sangat efektif dan mencapai tingkat kelulusan yang tinggi. Uji coba kepraktisan mendapatkan persentase sebesar 96,7% dari guru dan 96,30% dari siswa, yang termasuk dalam kategori sangat praktis. Sedangkan uji coba kemenarikan mendapatkan persentase sebesar 96,72% dari siswa, yang juga termasuk dalam kategori sangat menarik.

Dengan demikian, berdasarkan paparan di atas, dapat disimpulkan bahwa multimedia interaktif berbasis android untuk pembelajaran tematik materi peristiwa kebangsaan masa penjajahan pada siswa kelas V sekolah dasar layak digunakan. Produk ini memenuhi kriteria valid, efektif, praktis, dan menarik.

Kata Kunci: Multimedia Interaktif, Android, Tematik

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INTRODUCTION

Education is the acquisition of knowledge, skills, and habits by a group of people that is passed down from one generation to the next through teaching, training, or research (Agussalim, 2022). The development of technology in the use of instructional media in elementary schools has become increasingly diverse, including the use of modern technology such as laptops, computers, projectors, and smartphones. The utilization of Information and Communication Technology (ICT), especially computer usage in various fields, can enhance performance and enable activities to be carried out quickly, accurately, and efficiently. This will increase work productivity, including in the realm of learning (Ferdiansyah, 2021). Therefore, teachers need to be creative in utilizing technology as a support for learning activities in order to improve the quality of the learning process. As educational professionals, teachers have a vision to realize learning activities that are relevant to the principles of professionalism in order to fulfill the equal rights of the entire society to receive quality education (Tompul, 2022). According to Sudjana & Rivai (2010:7), the use of media is expected to enhance the quality of the teaching process. As learning technologists, we are required to assist teachers in ensuring successful learning, be it in terms of content, media, or learning resources. The most crucial element is instructional media (Ferdiansyah, 2022).

Media can be defined as tools that can enhance students' interest in learning. Furthermore, media can also motivate and improve students' understanding of the material, as well as present the material in an engaging manner to facilitate comprehension of the conveyed information (Sukmanasa et al., 2013:172). According to Miarso (in Haryono, 2014:48), media refers to everything used to transmit messages and stimulate students' thoughts, feelings, attention, and learning desires, thereby promoting intentional and controlled learning processes.

The use of media in the learning process serves as a tool to deliver the material more easily understood by students and achieve the learning objectives effectively. Arsyad (2014:19) states that the use of instructional media in the teaching and learning process can generate new interests and motivations, as well as have a positive psychological impact on students. Therefore, the use of media in learning can assist the learning process and students' understanding of the presented material. Additionally, media helps overcome constraints of time, space, and sensory capabilities in delivering the material (Tunjung & Purnomo, 2020:64).

Considering the importance of media in the learning process, the researcher aims to develop instructional media that aligns with technological advancements. One suitable media is interactive multimedia. Interactive multimedia is a combination of various elements such as graphics, text, sound, video, and animation (Arsyad, 2014:162). The use of interactive multimedia in learning can make the process more enjoyable, engaging, and easily understood as it involves both auditory and visual senses.

The results of the researcher's observations indicate several findings. Firstly, there is a lack of facilities and infrastructure in the school and classrooms, such as the absence of supporting media like

LCD or projectors. Secondly, students' motivation to participate in social studies learning is very low, evident from their lack of interest and tendency to engage in private conversations. Thirdly, the methods and media used in learning are still suboptimal, especially in social studies lessons that rely on lecture-based methods and question-and-answer sessions, with learning resources limited to student textbooks without additional supporting media.

During interviews, the classroom teacher revealed that students' lack of interest in social studies is due to the broad scope of the subject matter, which they find boring. Consequently, social studies lessons have little meaning for the students (Gunawan, 2011:108). Therefore, the researcher aims to develop an interactive multimedia based on the Android platform that is in line with the needs analysis. This media has advantages compared to previous methods as it can be used personally through Android-based smartphones, thereby increasing students' motivation and interest in self-directed learning anywhere and anytime. Hence, the title of the research is "Development of Android-based Interactive Multimedia in Thematic Learning."

METHOD

This research utilizes the ADDIE model as a guide for developing interactive multimedia based on Android. The basic principle of the ADDIE model is to guide learners in constructing their own knowledge within a learning space. This model is also a generative process that applies theory to a specific context (Branch, 2009:3). The ADDIE model consists of five interconnected and structured stages: analysis, design, development, implementation, and evaluation. This model is systematic as it establishes rules and procedures for designing a product or instruction. The researcher chose the ADDIE model because it aligns with Branch's perspective (2009:3) that using the ADDIE model is an effective choice in creating current products. The ADDIE model can also be used to develop educational products and other learning resources.

Tegeh's opinion (2014:41) also supports the use of the ADDIE model, where each stage of the model is easily understood and applicable in developing development products such as textbooks, learning modules, multimedia, and so on. Furthermore, each stage in ADDIE involves evaluation as an effort to minimize errors.

In this research, two data analysis techniques are used: qualitative descriptive analysis and quantitative descriptive analysis.

1. Qualitative Descriptive Analysis: The qualitative descriptive analysis technique is used to process feedback data from media experts, subject matter experts, teachers, and students. This data is analyzed by categorizing information from responses, criticisms, and suggestions for improvement found in the questionnaire. The data is used to understand the current situation and plan further work based on that understanding.
2. Quantitative Descriptive Analysis: a) Validity (feasibility): Data regarding validity is obtained from the assessment of media experts and subject matter experts. This quantitative data is

based on the results of a questionnaire containing validation criteria from the subject matter experts and media experts. These validity criteria are used to evaluate the developed product.

Table 1. Validity Criteria

No	Achievement Level	Qualification	Information
1	90%-100%	Very good	No need to revise
2	75%-89%	Good	Revised as necessary
3	55-64%	Not good	Much revised
4	0-54%	Very less	Totally revised

Source: (Tegeh 2014: 83) and modification of the researcher

According to Sugiyono (2016: 137) the percentage regarding validation results can be calculated using the formula below:

$$P = \frac{\Sigma x}{N} \times 100$$

Information :

P = Percentage gain from the validator

Σx = Total score value

N = Total ideal score

Meanwhile, the level of score achievement (Likert scale validity) used by researchers as a guideline is described below:

Table 2. Likert validity Scale

No.	Score	Information
1.	Score 4	Very good/ Strongly agree.
2.	Score 3	OK./ Agreed.
3.	Score 2	Not good/ Disagree.
4.	Score 1	Very unfavorable/ Strongly disagree.

Source: (Sugiyono 2016:137)

effectiveness

Data regarding aspects of effectiveness were obtained from student learning outcomes sheets in the form of practice questions. Exercise questions are used to measure the effectiveness of using interactive multimedia based on Android on national events during the colonial period:

Table 3. Effectiveness Criteria

No	Achievement Level	Qualification	Information
1	90%-100%	Very good	Very effective
2	75%-89%	Good	Effective
3	55-64%	Not good	Effective enough
4	0-54%	Very less	Less effective

Source: (Tegeh 2014: 83) and modification of the researcher

The formula for testing the effectiveness of student learning outcomes sheets is:

Score value = score obtained by students x 100 maximum score

While the level of achievement score (Likert scale) of effectiveness used by researchers as a guideline is described below:

Table 4.Effective Likert Kee Scale

No	Score	Information
1.	Score 4	Students score 81-100
2.	Score 3	Students score 66-80
3.	Score 2	Students score 51-65
4.	Score 1	Students score 0-50

Source: (Sugiyono 2016:137) and modification of the researcher

Practicality

Data regarding practicality aspects were obtained from assessments given by user responses when using Android-based interactive multimedia. The results of the assessment regarding the practicality aspect using the formula below:

$$P = \frac{\Sigma x}{N} \times 100$$

Information:

P = Percentage gain from users

Σx = Total score value

N = Total ideal score

RESULTS AND DISCUSSION

This study used the research and development (R&D) method to produce a product in the form of interactive multimedia based on Android. The development model applied in this study is ADDIE, which consists of the Analysis, Design, Development, Implementation, and Evaluation stages. The following are the results obtained from this research and development:

1. Problem Analysis

The problem analysis was conducted through observation and interviews with 5th-grade teachers at SD Madrasah Ibtidaiyah Muhammadiyah on March 1, 2022. The observation results showed that there is a lack of interest and motivation among students towards Social Studies (IPS) learning. Teachers stated that students are not interested in studying IPS because they perceive the subject matter as too extensive and reliant on memorization, making it boring and unappealing.

Based on the analysis, it was found that the IPS content in the thematic book for 5th grade can be presented in the form of interactive multimedia based on Android. By using this media, the material is expected to become more engaging and capture students' interest. The identified content focuses on the factors causing the colonization of Indonesia and Indonesia's efforts to maintain its sovereignty.

2. Design

The design stage was carried out after determining the learning design and conducting observations related to the analysis conducted. The design development for this media focused on

nationalistic content during the colonial period within the IPS subject. The design stage consisted of two design phases:

a. Design of Interactive Multimedia based on Android
b. Design of Research Instruments for Interactive Multimedia based on Android

3. Development

The development stage involved the creation of multimedia, including its initial creation and review by media and subject matter experts, as well as making necessary revisions. The multimedia was created based on the planned design in the storyboard during the design stage. The development of this multimedia utilized Unity and Photoshop applications, including creating the opening and closing sections.

4. Implementation

The developed multimedia, which has been validated and deemed suitable for trial, was tested with teachers and students. The trial was conducted with one 1st-grade teacher and 28 5th-grade students in an elementary school from August 10th to 14th, 2022.

5. Evaluation

The evaluation stage is the final stage of the ADDIE development model. In this stage, an evaluation was conducted on the interactive multimedia learning media based on Android. The evaluation involved media experts, subject matter experts, teachers, and students. Evaluation data were obtained through validation by media and subject matter experts, as well as through questionnaires filled out by teachers and students. The questionnaire analysis results indicated that overall, media experts, subject matter experts, teachers, and students provided very positive responses to the developed interactive multimedia. They provided various inputs, comments, and suggestions for improvement and refinement of the multimedia. In general, students responded positively to the media they used during the trial, demonstrating their interest in the developed multimedia and their desire to learn other subjects using similar interactive multimedia.

Discussion

The developed interactive multimedia in this study utilized the Android platform. This choice was made because in online learning, students and teachers often use smartphones as a learning medium. Therefore, almost every 5th-grade teacher and student have Android-based smartphones that can be used as learning media. Additionally, smartphones are a familiar technology for students, so most of them are accustomed to using smartphones.

The development of this multimedia was carried out using Unity and Photoshop applications. These applications allow for customizable animated images that can be tailored to the learning needs. With these applications, the multimedia can be equipped with sound and animations that support the presentation of the material and capture students' attention.

The process of developing this multimedia followed the ADDIE model (Analysis, Design,

Development, Implementation, and Evaluation). Each development stage was implemented according to the planned needs and steps. This study used two data analysis techniques: quantitative data analysis and qualitative data analysis.

Quantitative data analysis was conducted through questionnaire validation by media and subject matter experts to determine the validity of the product. In addition, student learning outcomes data were used to assess the effectiveness of the product, while questionnaires filled out by teachers and students were used to determine the practicality and attractiveness of the product. The results of the quantitative data analysis indicated that this interactive multimedia product was considered valid, effective, practical, and attractive based on the predetermined percentages.

Qualitative data analysis was obtained through interviews, observations, as well as comments and suggestions from media and subject matter experts. This qualitative data provided valuable inputs for improving and refining the developed product. Furthermore, the implementation results of the product in the field trial also demonstrated very good qualifications. Based on the qualitative data analysis, this Android-based interactive multimedia product can be considered valid, effective, practical, and attractive for use in teaching nationalistic events during the colonial period for 5th-grade elementary school students.

This research also referred to relevant previous studies. One of them is the development research conducted by Sintya (2018), who also developed valid, practical, attractive, and effective interactive multimedia for elementary school learning. Although there are differences in design, content, and research subjects, this study supports the findings and conclusions of previous research.

Another referenced research is the development study conducted by Rahmawati et al. (2020) who developed Android-based Edu-Game media. The results of the trial in that study also showed very positive and feasible student responses. Although there are differences in the products, content, and grade levels used, this research aims to provide optimal results in the learning process. However, there are limitations in this study, namely the media development only focused on IPS content and targeted 5th-grade elementary school students.

CONCLUSION

Based on the results of this study, it can be concluded that the development of Android-based interactive multimedia for thematic learning on nationalistic events during the colonial period for 5th-grade elementary school students, using the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation), has produced a viable product. This interactive multimedia meets the criteria of being valid, effective, practical, and attractive.

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