

DEVELOPMENT OF INTERACTIVE MATHEMATICS LEARNING MEDIA FOR SOCIAL ARITHMETICS MATERIALS WITH A CONTEXTUAL APPROACH BASED ON ADOBE FLASH

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ABSTRAK

This study is a development research that produces a product in the form of mathematics learning media using Adobe Flash CS6, focusing on social arithmetic material for Grade VII. The researchers employed the 4D model (Define, Design, Develop, and Disseminate). The instruments used included: (1) a media expert evaluation questionnaire, (2) a material expert evaluation questionnaire, and (3) a student response questionnaire. The trial subjects consisted of 23 Grade VII students from Muhammadiyah 57 Medan Junior High School.

The results of the study are as follows: (1) the development of mathematics learning media using Adobe Flash CS6 for social arithmetic material, and (2) the quality of the learning media based on validity aspects. From the material experts, the validation scores were 4.3 and 4.8, with an average of 4.5, categorized as "Very Good." The average validation score from media experts was 4.7, also categorized as "Very Good." Meanwhile, the student response score was 3.9, likewise in the "Very Good" category.

Based on these findings, the mathematics learning media developed using Adobe Flash CS6 on social arithmetic material is highly suitable for use as a reference teaching resource in the learning process.

Keywords: Learning Media Development, Social Arithmetic, Adobe Flash

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1. INTRODUCTION

Advances in science and technology (IPTEK) have brought significant changes to various aspects of life, including education. To keep up with these developments, the world of education needs to adapt to these developments, particularly in teaching. One approach is to utilize technology-based learning media that can create a more engaging, interactive, and contextual classroom atmosphere.

Mathematics, as a subject often considered difficult by students, requires creative learning strategies. The use of interactive media based on Adobe Flash is considered effective because it can present material through engaging audiovisuals. Several previous studies have shown that Adobe Flash-based media can improve learning quality, learning interest, and positive student interaction. For example, research by Nugraha (2017) demonstrated the effectiveness of Adobe Flash CS4 media in thematic learning, with excellent expert validation and trial results. Another study by Syahroni & Nurfitriyanti (2018) showed that interactive learning media based on 3D cartoons on numbers was considered suitable for use and received a very good rating. Furthermore, research by

Suryaningsih (2022) also demonstrated that animated videos based on Adobe Flash CS5 were able to increase student interest in learning about the perimeter and area of triangles.

However, many teachers in the field still underutilize interactive learning media and supporting facilities such as computers and projectors. This results in students quickly becoming bored and having difficulty understanding the material. Therefore, it is necessary to develop interactive mathematics learning media that are relevant to students' needs. Based on this problem, this study is entitled "Development of Interactive Mathematics Learning Media for Social Arithmetic with a Contextual Approach Based on Adobe Flash CS6."

2. METHOD

This research used the Research and Development (R&D) method with the aim of developing interactive multimedia based on Adobe Flash CS6 for Social Arithmetic for seventh-grade students at SMP Muhammadiyah 57 Medan. The development model used was the Four-D Model (4D), which consists of four stages: Define, Design, Develop, and Disseminate.

1. Define Stage

Activities in this stage include: (1) front-end analysis through interviews with teachers, which indicated that learning still uses conventional methods without interactive media; (2) concept analysis based on core competencies (KI) and basic competencies (KD); (3) task analysis to identify the skills required by students; and (4) formulation of learning objectives.

2. Design Stage

This stage includes: (1) preparation of benchmark tests as a link between the define and design stages; (2) selection of media appropriate to student needs; and (3) selection of formats, which include designing learning content, organizing materials, and designing multimedia displays (text, images, animation).

3. Development Stage

This stage produces an initial interactive multimedia product that is validated by subject matter and media experts using a questionnaire. Input from the validators is used for revision. Once declared valid, the product is piloted with 23 students to obtain feedback on the quality and appeal of the media. Based on the pilot test results, revisions are made until a final product is suitable for use in learning.

4. Disseminate Stage

The final validated and revised product is distributed on a limited basis via blogs in application format (.exe) for access by both teachers and students.

5. Data Collection Techniques and Instruments

Data are collected through interviews and questionnaires. Interviews are used in the definition stage to determine the initial learning conditions, while questionnaires are used in the expert validation and product pilot stages. The research instruments include interview guidelines, subject matter and media expert validation questionnaires, and student response questionnaires.

3. RESULTS AND DISCUSSION

This research produced interactive multimedia learning media based on Adobe Flash CS6 using the 4D development model (Define, Design, Develop, Disseminate) adapted from Thiagarajan, Semmel & Semmel. The subjects were seventh-grade students at SMP Muhammadiyah 57 Medan.

In the define stage, a needs analysis was conducted through interviews with educators, which revealed that social arithmetic learning still relied on textbooks without animation or video support, resulting in low student interest. Concept analysis emphasized the core material of social arithmetic (selling price, purchase price, profit, loss, and profit and loss percentages). Task analysis resulted in a mapping of core competencies, indicators, and learning objectives, including: comparing social arithmetic phenomena, inferring relationships between concepts, solving contextual problems, and presenting the results.

The design stage focused on multimedia design, including the development of validation instruments (with media experts, subject matter experts, and teacher and student response questionnaires), format and media selection, and the development of the initial design. The resulting product is interactive multimedia with a core structure consisting of a cover, materials, practice questions, and learning videos.

This research is a research and development (R&D) study aimed at producing interactive multimedia learning media based on Adobe Flash CS6 for Social Arithmetic for seventh-grade junior high school students and to determine student responses to the developed media. The development model used was the 4D (Four-D Model) by Thiagarajan, Semmel, & Semmel, which includes the stages of define, design, develop, and disseminate.

In the define stage, the researchers interviewed a seventh-grade mathematics teacher at Muhammadiyah 57 Junior High School, Medan, to analyze learning needs. The interview revealed that no interactive multimedia-based learning media had been developed at the school before. The design stage involved designing media components, such as materials, images, and videos on social arithmetic. These components were then designed using Adobe Flash CS6 and published in .exe format.

The development stage included validation by subject matter and media experts, as well as product trials with 23 students. The trial results showed an average response rate of 3.9, categorized as "very good," indicating that students were active, enthusiastic, and understood the material more easily through illustrations, images, and videos in the multimedia.

The final stage, dissemination, involved distributing the product through Google Drive and promoting it to teachers. Teachers responded positively to the developed media. Based on these results, it can be concluded that the Adobe Flash CS6-based interactive multimedia for Social Arithmetic for seventh grade junior high school students is suitable for use as an alternative learning medium that is engaging, interactive, and enhances student understanding.

4. CONCLUSION

Based on the results of the research and development conducted by the researcher, the following results were obtained:

1. The Adobe Flash CS6-based interactive multimedia for Social Arithmetic for grade VII junior high school was developed using the 4D development model, consisting of four stages: define, design, develop, and disseminate.
2. The feasibility of the Adobe Flash CS6-based interactive multimedia for Social Arithmetic for grade VII junior high school was assessed through validation by media experts and material experts. The media expert validation yielded a feasibility percentage of 4.7, categorized as very good, and the material expert validation yielded percentages of 4.3 and 4.8, categorized as very good.
3. The student response to the Adobe Flash CS6-based interactive multimedia for Social Arithmetic for grade VII junior high school, through a trial, yielded an average score of 3.9, categorized as very good. Therefore, the developed Adobe Flash CS6-based interactive multimedia is feasible and can be used as a learning medium for Social Arithmetic for grade VII junior high school.

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