



DEVELOPMENT OF INTERACTIVE LEARNING MEDIA BASED ON PROBLEM BASED LEARNING IN CLASS V THEMATIC LEARNING AT SD SWATA MARKUS MEDAN

Paskah Apryanti Pakpahan¹

State University of Medan, Indonesia

Email : paskahpakpahan82@yahoo.com

Sugiharto²

State University of Medan, Indonesia

R. Mursid³

State University of Medan, Indonesia

Abstract

This research and development aim to: (1) produce interactive multimedia based on problem based learning that is suitable for use in the sub-theme of national events during the colonial period, and (2) determine the improvement of student learning outcomes from the use of interactive multimedia based on problem-based learning in the sub-theme of national events, developed colonial period. This type of research is research and development that uses a 4-D model. The research method consists of two stages: the first stage of developing learning multimedia and the second stage of testing the product's effectiveness. The results of the research in the development stage of learning multimedia products show that: (1) the assessment of material experts is in the very feasible criteria with an average score of 4.58, (2) the assessment of media experts is in the very feasible criteria with an average score of 4.51. The effectiveness of the learning device was concluded based on the post-test results of students in the second trial, the percentage of classical completeness was 90% with 30 students or 90% declared complete. Moreover, 3 students or 10% are declared incomplete. 3) The practicality of student learning media is concluded based on the teacher's response; the teacher's response to the learning media in the first trial reached 91.67%, which was included in the convenient category. Assessment of student learning outcomes based on pretest and post-test analyzed using N-Gain obtained an average gain value of 0.7, which is in the high category.

Keywords: *Development, Interactive Media and Problem Based Learning*

A. Introduction

With the Covid-19 pandemic, the presence of technology is felt in the learning process. Because, in current conditions, it is not possible to do face-to-face learning, so online learning is the primary choice. One of the uses of ICT currently developing in the learning process is media in interactive multimedia learning. According to Deni Darmawan (2014: 55 - 56), Learning with interactive multimedia can activate students to learn with high motivation because of their interest in multimedia systems that can present the appearance of text, images, video, sound, and animation. This statement shows that students can be enthusiastic about interactive multimedia because it looks attractive and supports learning. The combination of text, images, video, sound, and animation can be a source of learning for students.

This is in line with research Bagus, et al. (2020) suggest that the application of interactive learning models can improve the quality of student learning and is an innovative learning resource for elementary school students. These interactive multimedia has advantages, namely, in addition to having animations, menus, and buttons, it also requires users to be more interactive in their use so that learning becomes more exciting and meaningful. Trianingrum (2017) suggested that interactive multimedia learning media can help students do learning independently; besides that, the menu choices are designed in such a way as to give students the freedom to choose the material to be studied. This interactive multimedia can be a learning medium that involves children's cognitive, affective, and psychomotor aspects. Syabrina, et al. (2020) [668]

states that interactive multimedia based on Macromedia flashing provides an exciting learning experience for students, both in terms of effectiveness, applicability, and attractiveness.

Multimedia can be packaged and optimized to improve students' abilities if combined with a suitable learning model. One of the learning models considered appropriate is the Problem Based Learning (PBL) model because this model can develop students' thinking skills, improve problem-solving abilities, work abilities, and intellectual skills and foster social attitudes.

Based on initial observations made by researchers at SD Swasta Markus Medan, it was found that student learning outcomes on the sub-theme of national events during the colonial period were still low below the KKM of 70 (seventy).

Problem-based learning models also need to be applied in the learning process because learning is carried out by exposing students to real problems in everyday life to develop their knowledge in solving problems and seek various solutions that encourage students to think creatively. Many learning media found in the field are not following the needs of students. This is because the coverage of material in the media is made for the general public and does not pay special attention to the characteristics of the needs of the school that will use it, the examples and illustrations displayed in the media do not refer to the surrounding environment, and are not following the curriculum applied in schools.

The use of learning media by utilizing educational technology is one solution to develop teacher learning media. Education observers have felt the benefits of media in learning, continues to make them continue to develop learning media relevant to students' needs, and pays attention to pedagogical and curriculum aspects that students must achieve. With

interactive multimedia, it is hoped that it can assist teachers in delivering material, assist students in deepening subject matter, and improve student learning outcomes.

B. Method

1. Type of Research

This research is a type of research and development Research & Development (R & D). This study aims to develop learning media software on the sub-theme of national events during the colonial period. Educational development research conducted includes the process of product development and validation. Through research and development, researchers are trying to develop a product that is effectively used in learning. The product produced in this study is Adobe Flash CS 6 learning media to improve student learning outcomes.

2. Research Subjects and Objects

The subject of this research is the students of SD Swasta Markus Medan, which consists of class V as a class that is given learning using interactive media based on problem based learning as objects in this study are learning media and learning outcomes tests.

3. Development style

Thiagarajan (in Trianto, 2011; 190) suggested that the device development model is a 4-D model consisting of 4 stages of development, namely, definition, design, development, and dissemination.

4. Development Procedure

[670]

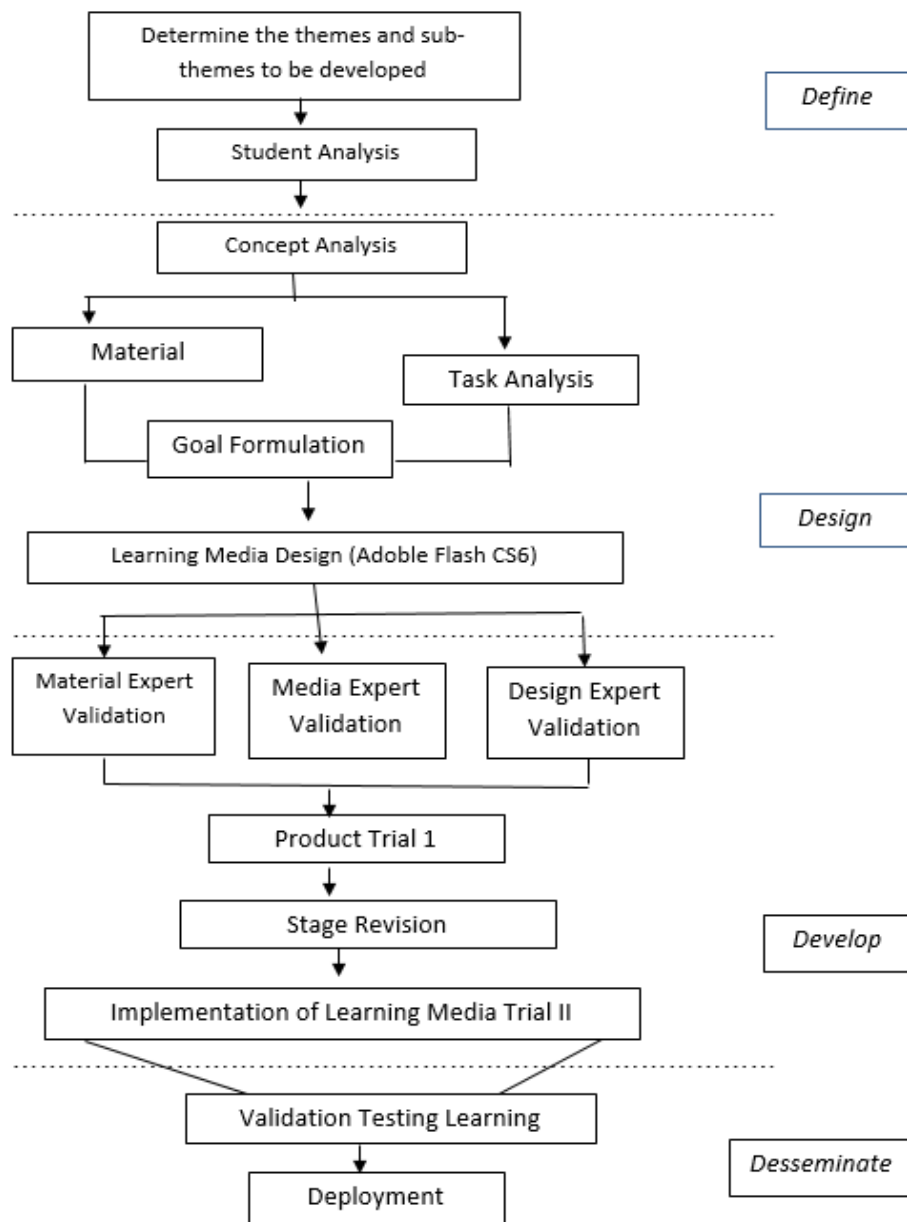


Figure 1. Thiagarajan Four-D (4D) Development Procedure Design Adaptation (Trianto 2011:190)

a) Defining Stage

The purpose of this stage is to determine and define the learning conditions. At this early stage, an analysis is carried out to determine the learning objectives and the limitations of the material to be developed in the class, the sub-theme of national events during the colonial period. The definition stage consists of three steps of analysis, namely: Front-end Analysis, Student analysis (Learner Analysis), Analysis of tasks (Task Analysis), Analysis of concepts (Concept Analysis), Analysis of learning objectives (Specifying Instructional Objectives)

b) Planning Phase (Design)

This stage consists of three steps: preparing tests, selecting media, and initial design.

c) Development Phase

This development stage aims to produce media revised based on expert input and trials to students. There are two steps in this stage: Expert Validation (expert appraisal) and Product Testing (development testing).

d) Dissemination Stage

This stage is the stage of using the media. The dissemination stage is carried out by disseminating the research results on the development of learning media through journals to be used as an alternative for teachers in particular when teaching and for readers in general. In the Dissemination Stage, the dissemination is carried out by giving it to the next researcher, uploading a link to make it easier to download, and distributing learning media software for teachers to use in class V SD Swasta Markus Medan.

5. Data Collection Instruments

Data collection instruments are used to assess the learning media developed in this development research: a questionnaire and a test sheet.

6. Instrument Trial

Instrument trials include Test Validity, Question Reliability, Test Difficulty Level, and Test Differentiation.

7. Data analysis technique

Analysis technique data in testing the feasibility of interactive multimedia products on The sub-theme of the national events of the colonial period uses quantitative analysis, namely: Test Data Analysis Techniques, Learning Media Effectiveness Analysis Techniques Using Interactive Multimedia and analysis of Improving Student Learning Outcomes.

C. Finding and Discussion

1. Result

Trial I

1) Analysis of teacher response data in the trial I

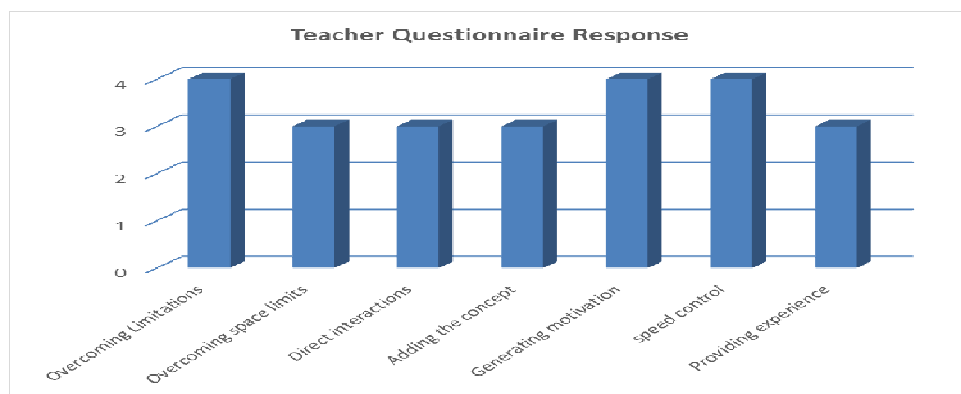


Figure 5. Teacher Response Analysis Diagram

From the data obtained, it is known that the teacher's response to the developed media with the achievement of a percentage of 85.71%,

which is included in the positive category. So seen from the teacher's response to the media, it is feasible to be used as a learning medium.

2) Analysis of the effectiveness of student learning outcomes in the trial I

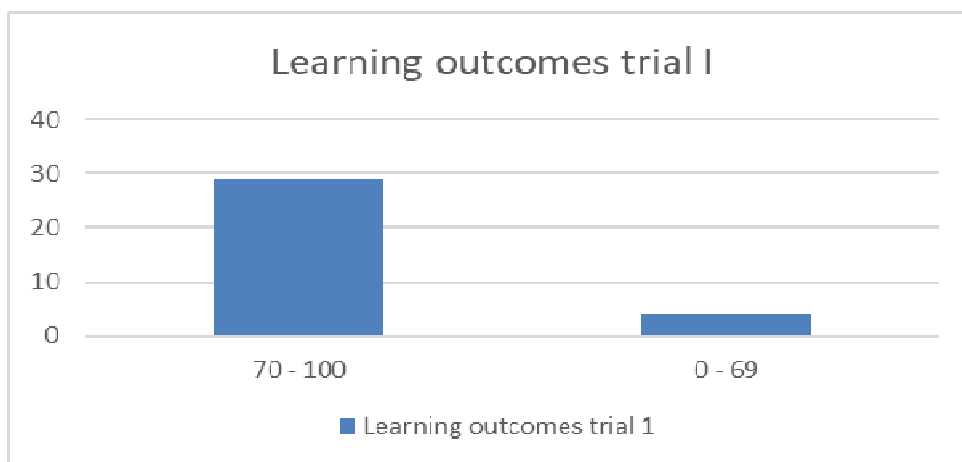


Figure 6. Diagram of Experimental Learning Outcomes I

Based on the data on the level of student learning outcomes in the first trial, it can be classified into complete and incomplete levels

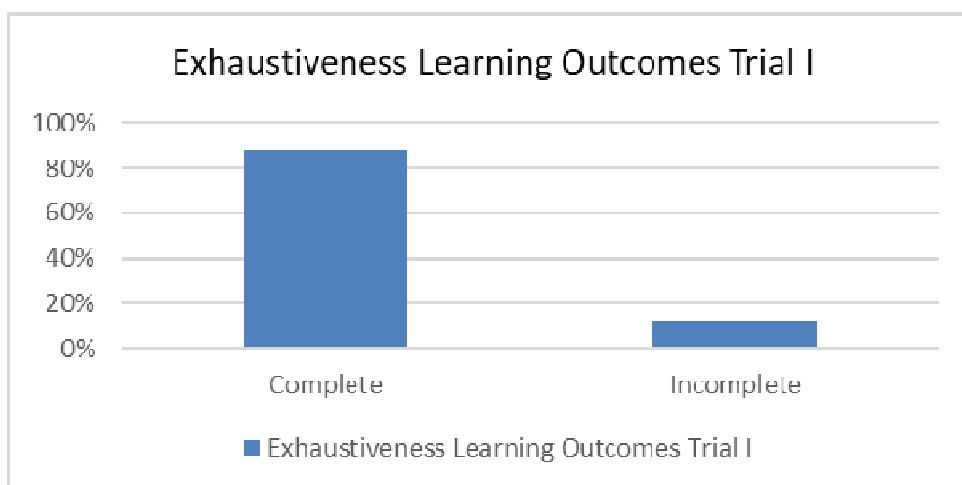


Figure 7. Diagram of Mastery Student Learning Outcomes Trial I

3) Analysis of student learning outcomes in the trial I

Calculation results using Microsoft Excel obtained an average gain value of 0.56. This gain value is interpreted into the criteria for the gain value, which is in the medium category. With these results, it can be concluded that students who use learning media using adobe flash can improve learning outcomes in the sub-theme of national events during the colonial period.

Trial II

1) Teacher response analysis on trial II

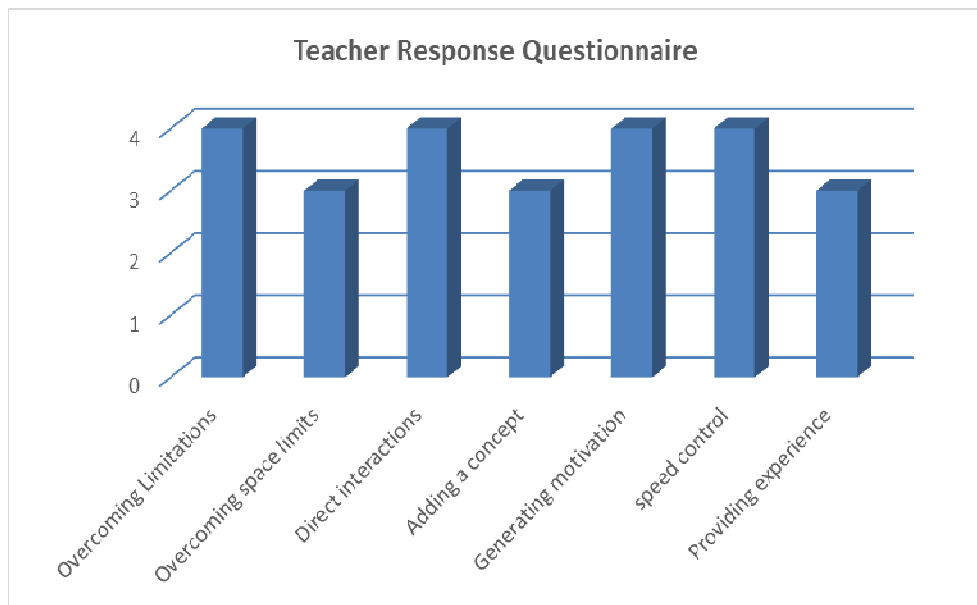


Figure 8. Teacher Response Analysis Diagram

2) Analysis of the effectiveness of student learning outcomes in the second trial

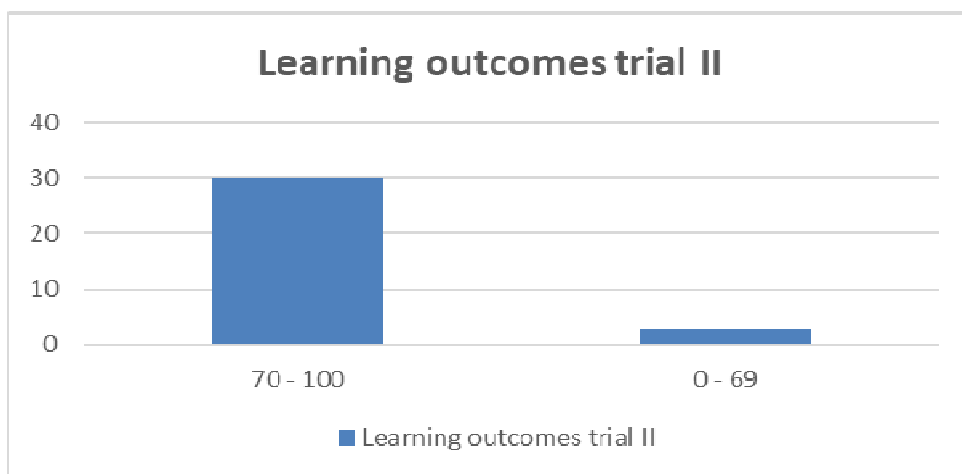


Figure 9. Diagram of Learning Outcomes Trial II

Based on the data on the level of student learning outcomes in the second trial, it can be classified into complete and incomplete levels

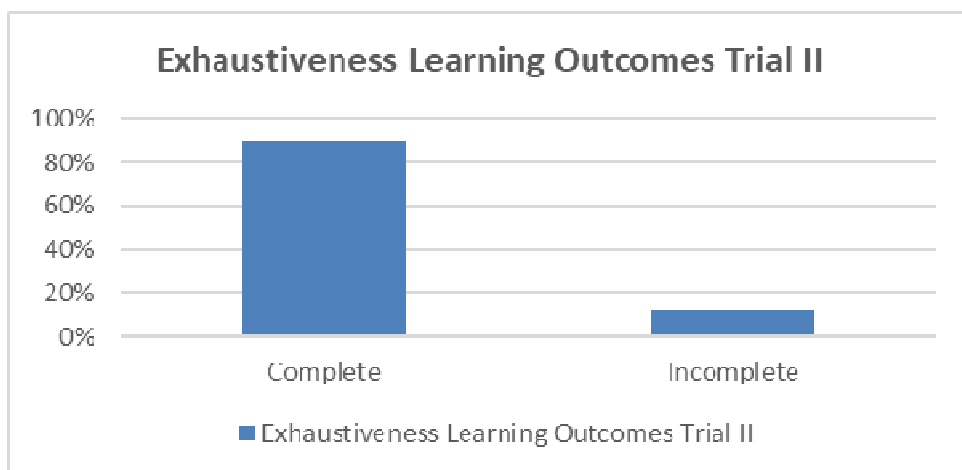


Figure 10. Mastery Diagram of Student Learning Outcomes Trial II

3) Analysis of student learning outcomes in the second trial

Overall, the second trial data analysis results show that interactive multimedia based on problem-based learning has met the effective criteria. Thus it is known that the results of the second trial are better than the first trial. This is because the learning media used in the second [676]

trial is a revised learning media from the revision I learning media. It can be concluded that the interactive multimedia based on problem based learning developed has been effective.

2. Discussion

a. Interactive Multimedia Development Process

The interactive problem-based learning media product aims to improve learning and learning outcomes on the sub-theme of national events during the colonial period for fifth-grade students at SD Swasta Markus Medan. This interactive learning media can allow students to learn independently and follow the thinking power of individual students. In addition, each student becomes more focused on the interactive learning media they use individually because of the direct interaction between students and the media. The problem-based learning materials presented can also facilitate students' understanding of the sub-themes of national events during the colonial period because these materials are familiar with students' daily environment.

b. Discussion of Product Feasibility Test Research Results

The results of the questionnaire submitted to the material experts gave a response of 4.58 that interactive multimedia based on problem based learning is suitable for use because it contains material and delivery criteria that meet the requirements for delivering messages to students. Media experts gave 4.51 responses that the interactive media multimedia based on problem based learning is feasible because it has met the principles and criteria for developing learning media.

Based on the results of validation and testing, then interactive multimedia based on problem based learning is very suitable for use in the sub-theme of national events during the colonial period. Thus, the

media is very suitable for the sub-theme of national events during the colonial period to support the effectiveness of the learning process. These results indicate that the interactive multimedia developed is suitable for use in learning activities and becomes an alternative source of learning, especially for fifth-grade students in the sub-theme of national events during the colonial period. Interactive multimedia can help students in the learning process. This interactive multimedia attracts students' attention and interest in learning, making it easier to remember learning materials.

c. Discussion of Product Effectiveness Test Results

Learning media is categorized as effective if students understand the subject matter and student learning outcomes as expected. The percentage of classical completeness (PKK) of students is 90%. This PKK was obtained from the post-test of student learning outcomes after using interactive multimedia-based thematic learning media. The analysis of the effectiveness of student learning outcomes after using learning media shows that grade 5 students have completed their studies because PKK is 85%. Therefore interactive multimedia-based thematic learning media are effectively applied in the learning process.

d. Improving Student Learning Outcomes

The average pretest score of students before using learning media was 8.1, and the average post-test score of students after using learning media was 16.4. The increase in student learning outcomes was analyzed using N-Gain obtained from pretest scores and post-test scores. The average gain of N-Gain is 0.70. The average is categorized as high because $\text{Gain} > 0.70$. Therefore, student learning outcomes increase after using interactive multimedia-based thematic learning media.

D. Conclusion

After carrying out the process or stages of developing problem-based learning-based interactive media, the following conclusions can be drawn:

1. The interactive learning media product based on problem-based learning developed on the sub-theme of the colonial era national event for fifth graders at SD Swasta Markus Medan has met the requirements and is suitable for use as a learning medium. This is concluded based on the results of assessments from learning materials experts (4.58) and media experts (4.51), which overall stated that problem-based learning-based interactive learning media were in the "very feasible" criteria.
2. The interactive multimedia-based learning media developed has been effectively used to improve student learning outcomes in the learning process. This can be seen from the analysis of student learning outcomes using interactive multimedia-based learning media, which is developed higher than the learning outcomes of students who learn to use PowerPoint learning media

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