



Original Research Article

Development of Floor Gymnastics Textbooks Flip book Based Green Screen Animation

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Abstract: This research uses a research and development model, namely the development model ADDIE which covers the level Analyze, Design, Develop, Implement, Evaluate. From several stages of testing given to experts and also to small samples, large samples and comparison samples, a difference in results was obtained from each stage, including: 1) In the assessment of animation experts in the initial stage, a total score of 79% was obtained, entering the feasible category. In the second stage, a result of 90% was obtained with a recommendation to continue to the next stage. 2) In the first assessment of language experts, a total score of 79% was obtained, entering the feasible category. In the second stage of language expert testing, a result of 90% was obtained. 3) In the assessment of material experts in the initial stage, a total score of 79% was obtained, entering the feasible category. In the second test stage, a result of 91% was obtained with a recommendation to continue to the next stage. 4) In the small group assessment, a total score of 79% was obtained. 5) In the large group assessment, an increase was shown with a percentage of 90% entering the very feasible stage, so it was concluded that the media flip book floor gymnastics based green screen very good to be used on students of physical education, health and recreation, faculty of sports science, Medan state university and continued for testing on a wider group. 6) From the results of the comparison group research above, it shows a percentage of 80% with a good category, but when viewed with a large sample, the large sample gets a very good percentage for the development of floor gymnastics learning media, so it is concluded that the media flip book floor gymnastics based green screen After undergoing tests on several samples, it was concluded that this media is suitable for use in floor gymnastics learning. The research products are: (1) Fleep Book (2) Android application of floor gymnastics material in animation green screen (3) Indexed International Journal (4) Product IPR.

Keywords: Development of Floor Gymnastics Textbooks Flip book Based Green Screen Animation

INTRODUCTION

The world of education in Indonesia is experiencing significant development. This development is evident in the increasing diversity of learning methods used. Many of these methods utilize various media to improve the quality of learning outcomes. The development of various learning media is in line with increasingly rapid technological advances.

The dynamics of technology are currently experiencing extraordinary acceleration. Technologies learned just a few years ago are beginning to be replaced by new technologies, including various conventional learning systems.

One form of information technology development that can be utilized as a learning medium is the use of animation-based technology to stimulate student interest in learning.

Learning and instruction are the primary activities in an educational process. Learning activities can be carried out if students are given the opportunity to participate in the learning process. Likewise, the learning process will proceed well if students are involved in learning. In general, learning can be defined as a process of acquiring competence. This competence includes knowledge, skills, and attitudes. According to the philosophy of idealism (Plato), the learning process occurs when ideas are

developed in the mind, while according to the philosophy of realism (Aristotle), the learning process occurs when individuals interact with the physical world.

Judging from its origin, the word "media" comes from Latin and is the plural of the word "medium," meaning intermediary or messenger. Therefore, media can be a vehicle for conveying information or conveying messages. Broadly speaking, media can be people, events, or objects that enable students to acquire attitudes, knowledge, and skills.³. Media terms that are also used in learning or education, so called educational media or learning media.

Gymnastics is a body exercise that is created systematically and regularly and every movement provides benefits to the people who do it, in order to...achieve the desired goal". Movement *hand jump* is a bouncy movement done with attitude *hand stand* with the pelvis pushed forward the body forms an arc and landing using both feet simultaneously.

Floor gymnastics is "one of the gymnastics groups. As the term floor suggests, the movements/exercise forms are performed on the floor. So, the floor/mat is the equipment used."⁶. ⁷Floor gymnastics is "movement exercises with various variations of movements, including forward rolls, backward rolls, springboard rolls, tiger jumps, cartwheels, and handstands".⁷. Backward roll movement (*back roll*) is "rolling backwards, the body position must remain rounded, that is, the legs are folded, the knees remain attached to the chest, the head is lowered until the chin is attached to the chest.

Learning media is one method for overcoming all kinds of problems in teaching, not only solving problems, but learning media provides various comprehensive information to students.⁸ According to Daryanto (in Apriansyah, 2020) the benefits of learning media are as follows: (1) can explain learning materials more simply; (2) increase student engagement in the learning process; (3) maximize all senses; (4) guide students to be more independent in increasing insight; and (5) provide the same information to all students.

Flip book Flipbook software is a software that can open each page like a book. Flipbook software can create and convert PDF files, images, and photos into a physical book or album when opened

individually (Fauzan et al., 2019). A flipbook is a visual learning tool consisting of sheets of paper containing images and text bound at the top so they can be flipped. (StudyCha, 2021)

In the world of film, it's undeniable that pre-recorded videos are edited. In this editing process, backgrounds are often replaced or removed. Removing these backgrounds can be very difficult without using a pre-recorded background. One common background color used in filmmaking or music video clips is the color of the background.

A green background, or green screen, is a common term. Seeing a green background often raises the question: why green? What exactly is a green screen, and why is it so commonly used?

The aim of this research is to develop learning media in the form of a flip book-based floor gymnastics textbook with green screen animation that is suitable, interesting, and effective for use in the lecture process of floor gymnastics courses.

Research methods

This research is a Research and Development (R&D) study using the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) model. The study was conducted at the Faculty of Sport Science, Medan State University, from June to August 2025.

The study population was 760 students of the Physical Education, Health, and Recreation Study Program, class of 2025. The sample consisted of an experimental group, a control group, and a comparison group selected using cluster random sampling. Respondent characteristics included ages 18–21 years, with a proportion of 60% male and 40% female.

The research instruments consisted of an expert validation questionnaire (media, language, and materials) and a student response questionnaire. The instruments used were modified from the MMEVQ questionnaire previously developed by other researchers in the context of evaluating learning media. Data were analyzed using quantitative descriptive analysis techniques using a Likert scale (1–4). The eligibility category was determined by percentage, without including an average formula.

Research result

The aim of this research is to develop teaching media development, *flip book* animation-based floor gymnastics *green screen*. Development model *Borg and Gall* used to create this teaching media, and the results of each stage are listed below.

1. Analyze (Analysis)

At the analysis stage, the method that the researcher used was observation of the need for floor gymnastics materials by conducting...

Interview with lecturers of gymnastics courses and students. Observation.

2. Design (Design)

The design process is the media planning stage. This stage also involves designing research instruments to measure the feasibility of the developed media and improve graduate achievement.

3. Develop (Development)

The development stage consists of 3 steps, namely (1) developing content standards (2) developing media and (3) product validation.



Application Image

A. Animation Media Expert Validation 1

Based on the assessment of animation experts, the basic appearance of each material should be different, 80% is in the feasible category, each material should give a more interesting effect, 79% is in the feasible category, the lighting of the material needs to be adjusted, 80% is in the feasible category, the basic background of the material should be more interesting, 79% is in the feasible category. The overall assessment percentage of animation experts is 79% in the feasible category with revisions. The suggestions or input received by researchers from instrument experts include: 1) It is necessary to arrange the animation form that is appropriate to each material, the clarity of the material and the learning objectives.

B. Animation Media Expert Validation 2

Based on the assessment of animation experts, the basic appearance of each material should be different 90% very suitable category, each material gives a more interesting effect 90% very suitable category, material lighting needs to be adjusted 90% very suitable category, basic background of the material should be more interesting 92% very suitable category. The overall assessment percentage of animation experts is 90% very suitable category with recommendations that can be continued to the next stage.

C. Validation by Linguist 1

Based on the assessment of language experts conducted by instrument experts with the indicator of writing rules in accordance with the norms of 78% in the appropriate category, the indicator of subtitles in images needs adjustment 78% in the very appropriate category, the indicator of language pronunciation is slowed down 81% in the appropriate category, the indicator of writing and reading flow adjustment 78% in the appropriate category, the indicator of language structure needs adjustment 80% in the appropriate category. The percentage of the overall assessment of language experts is 79% in the appropriate category. From the first test conducted by experts, several revisions need to be made, including: 1) The pronunciation of the material is adjusted to the form of movement, 2) the language must be clearer. After revising the floor gymnastics teaching media product, a green screen-based flip book floor gymnastics teaching media application product was produced.

D. Validation by Linguist 2

Based on the assessment of language experts carried out by instrument experts with writing rules indicators in accordance with the norms of 90% in the very appropriate category, subtitle indicators in images need adjustments of 88% in the very appropriate category, language pronunciation indicators are slowed down 90% in the very appropriate category, writing and reading flow adjustment indicators 90% in the very appropriate category, language structure indicators need adjustments of 91% in the very appropriate category. The percentage of the overall assessment of language experts is 90% with a very appropriate category for use with recommendations that can be continued to the next stage.

E. Expert Validation of Gymnastics Material 1

The results of the validation by material experts on the indicator: Good material according to the easiest order 79% in the feasible category, the sample indicator must have more mastery of the material

80% category is suitable, the movement indicator for each material must be better 79% category is suitable, the material sequence indicator has opening and closing movements 78% category is suitable. The percentage of the overall assessment of material experts is 79% with a category suitable for use, with improvements including, 1) The material needs to be sequenced from easy to difficult, 2) The movement in each material needs to be made slow motion, 3) the addition of explanations to each material is clearer.

F. Expert Validation of Gymnastics Material 2

The results of the validation of material experts on the indicator of good material according to the easiest order 95% in the very feasible category, the indicator of the Sample must be more proficient in the material 90% in the very feasible category, the indicator of the movement of each material must be better 90% in the very feasible category, the indicator of the sequence of material there are opening and closing movements 90% in the very feasible category. The percentage of the overall assessment of material experts is 91% in the very feasible category with recommendations that it can be continued to the next stage.

G. Small Group Test

Based on the table and diagram above, the assessment of floor gymnastics learning media with indicators of gymnastics material 78% in the feasible category, indicators of learning video display 79% in the feasible category, indicators of background video 79% in the feasible category, indicators of learning animation attractiveness 80% in the feasible category, indicators of sequence of gymnastics learning material 79% in the feasible category, indicators of explanation of gymnastics material 79% in the feasible category, indicators of evaluation of gymnastics learning 79% in the feasible category. The overall assessment percentage for small groups is 79% in the feasible category with improvements.

4. Implementation

After going through improvements from all experts and a small-scale trial stage, the teaching media material for floor gymnastics based on...*flip book based green screen* for students majoring in Physical Education, Health, and Recreation, with a total of 760 students. Then, each respondent provided an assessment response to the questionnaire given. The results of the response assessment to the floor gymnastics teaching media based on *flip book based green screen* can be seen in the following image:

H. Large Group Test

Based on the assessment of the floor gymnastics learning media questionnaire, a large sample was conducted with indicators of 90% of the gymnastics material in the very appropriate category, 90% of the learning video display in the very appropriate category, 89% of the video background in the very appropriate category, 89% of the learning animation's attractiveness in the very appropriate category, 92% of the gymnastics learning material sequence in the very appropriate category, 89% of the gymnastics material explanation in the very appropriate category, 90% of the gymnastics learning evaluation in the very appropriate category. From the results of the large sample study above, it shows a percentage of 90% in the very appropriate category, so it is concluded that the media *flip book floor gymnastics based green screen* very suitable for use by students of physical education, health and recreation, faculty of sports science, Medan State University.

I. Comparison Group Test

Based on the assessment of the floor gymnastics learning media questionnaire, a large sample was conducted with indicators of gymnastics material 81% in the appropriate category, indicators of learning media 80% in the appropriate category, indicators of learning materials 79% in the appropriate category, indicators of sequence of gymnastics learning materials 79% in the appropriate category, indicators of achievement of learning objectives 80 in the appropriate category, indicators of explanation of gymnastics material in the appropriate category, indicators of evaluation of gymnastics learning 80% in the appropriate category. From the results of the comparison group study above, it shows a fairly good percentage of student responses, but when viewed with a large sample, the large sample gets a very good percentage of the development of floor gymnastics learning media.

1. Evaluate (Evaluation)

After going through the process of the previous stages, the development of learning media *flip book based green screen* For the floor gymnastics course for students of Physical Education, Health and Recreation, Faculty of Sports Science, State University of Medan, several improvements must be made based on the results of expert assessments and after making improvements, the media considered worthy of being treated as such by students.

DISCUSSION

The research results show that the green screen animation-based flip book media experienced quality improvements through a revision process based on expert input and gradual trials. This aligns with Budiyo's (2020) theory that the ADDIE model allows for continuous evaluation to improve product quality.

The finding that the large group achieved a score of 90% proves that the use of green screen animation-based flip books can increase student interest and understanding, in accordance with Tafonao's (2018) opinion regarding the importance of learning media in increasing student engagement. Furthermore, the use of green screens has been shown to improve the visualization of gymnastic movements, supporting Reiser & Gagne's (1983) theory on the role of media as an instructional communication channel.

Conclusion

Green screen animation-based flipbook media has proven feasible, engaging, and effective for use in floor gymnastics instruction for Physical Education, Health, and Recreation students. Results from expert, small group, large group, and comparison tests all showed good–very feasible categories.

This study was limited to students from the class of 2025 at Medan State University and was limited to the floor gymnastics course. Further research could test the effectiveness of this tool at other educational levels or in other courses. This study has received approval from the Research Ethics Committee of Medan State University.

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