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Developing Interactive Learning Media Using Powtoon to Improve Students' Interest and Learning Outcomes in Global Warming Material

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Abstract

The purpose of this study was to explain how well Powtoon Instructional Materials can help teachers carry out learning activities that can improve students' interest and learning outcomes on the topic of global warming. To explain how well Powtoon Instructional Materials can improve students' interest and learning outcomes. This study uses a type of development research commonly called Research and Development (R&D) with the ADDIE model (Analysis, Design, Development or Production, Implementation or Distribution, and Evaluation). 3 validators conducted validation to produce a feasible product, and the result was 87.6%, which indicates a very feasible category for use. According to the results of the distributed learning interest questionnaire, the initial results of the questionnaire were 55.2% for the low category and the final results were 73.4% for the moderate category. The pretest-posttest and N-Gain results were calculated to determine student learning outcomes. The calculation results show that the N-Gain score of 0.69 is in the moderate category and the N-Gain percentage of 69.5% is in the fairly effective category.

A. Introduction

The mindset of today's society has changed a lot in seeking and obtaining information with the advancement and development of technology and communication, this also has an impact on the advancement and development in the world of education. There are several components to the educational process, such as the students themselves, learning media as a tool for the process, and educators (teachers/lecturers) as knowledge sources.

Information and communication technology, or ICT, is a crucial component of modern life. It is used extensively in human activities since it is currently the primary tool in many areas of life, including education. ICT advancements in education have a significant impact, particularly on learning (Lawrence & Tar, 2018). Innovative usage of ICT in the classroom can significantly impact the learning process and assist students in developing skills relevant to the times (Liesa-Orús et al., 2020).

Success in learning can be achieved by forming effective communication between its components. Effective communication can be formed by using learning media, where the role of learning media here is as information carrier technology (Azzahra et al., 2022). The learning process using learning media can arouse interest, new desires, motivational stimulation in learning and have an impact on the psychology of students (Gaol & Sitepu, 2020). To increase student learning performance, the learning process must use digitally based learning materials (Ismiyati et al., 2021).

Educational media play an important role in the teaching and learning process. Learning media can assist teachers communicate content to students and make the teaching and learning process more engaging and

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conducive (Bahar et al., 2020). Students become easily bored and lose interest in learning activities due to the underutilization of learning media (Sunardi et al., 2021).

The use of learning media can help students to be more responsible, be able to control their own learning, and be able to take a long-term perspective on their learning (Ernawati & Sukardiyono, 2017). In order to stimulate students' thoughts, feelings, behaviors, interests, and attention and facilitate the teaching and learning process, educational media are used as a tool, means, intermediary, and connector to transmit, carry, or convey a message and concept.

Learning materials can be divided into four categories: 1) Visual media: such as books, graphics, and photos, this kind of media is exclusively visible. 2) audio media, which includes devices like radios and tape recorders that can only be heard. 3) Audiovisual media, which consists of a blend of visual and aural elements, allows us to see and hear things. Examples of this include television, movies, and videos. 4) Multimedia: this kind of media combines various media forms (Aghni, 2018).

Powtoons is a type of animation presentation media processing software based on saas (application as a service) that can be accessed online via the powtoon web, Powtoon can be used as a teacher's aid in carrying out the learning process. The Powtoon display is in the form of an animated video that can attract students' interest in learning a material (Hulu & Telaumbanua, 2022).

Interest is a process that can give behavior zeal, focus, and perseverance. Motivational conduct is characterized by its vigor, focus, and durability. Motivation in learning activities can be interpreted as a driver in students and learning activities become more focused, so that the goals in the learning process are achieved (Filgona et al., 2020).

Learning outcomes are specific skills or abilities that students acquire or master after engaging in the learning process, whether they be cognitive, emotional, or psychomotor (Owan et al., 2022).

According to the findings of the observations and interviews, the learning process in class XI is conducted offline or in person and follows the 2013 Curriculum. The medium utilized to carry out learning activities is less appealing to their learning interests, which leads to low physics learning outcomes. This is one of the reasons why many students still show less interest in participating in learning activities during physics instruction. Teachers utilize LKPD, PowerPoint, and printed books as their learning resources.

Given the foregoing context, the following goals are to be met by this study: a) explain whether Powtoon learning materials can assist teachers in carrying out instructional activities. b) Explain how Powtoon learning media might boost students' motivation to learn. c) Explain how Powtoon learning media can enhance students' learning results.

B. Research Methods

This kind of study employs a development research methodology commonly referred to as research and development (R&D). Research and development can be characterized as a scientific approach to product creation, production, testing, and validation. The creation and application of new product concepts or enhancements to current products is known as research and development, or R&D. The production of new products or improvements to existing products that require refinement is the core of R&D development research. The existence of improvements or further development of a problematic product or model will create a new product or model with better ideas and concepts.

SMA N 2 Bengkulu City, Jl. Mahogany No.14, RT.003/RW.06, Padang Jati, Kec. Ratu Samban, Bengkulu City, Bengkulu 38222, is where this study was carried out. During the even semester of the 2024–2025 school year, research was conducted.

The ADDIE research model is used in this R&D study. The five phases or stages of model development that comprise the ADDIE development research model are analysis, design, development, implementation, and evaluations.

The stages of development research with the ADDIE research model are shown in Figure 1.

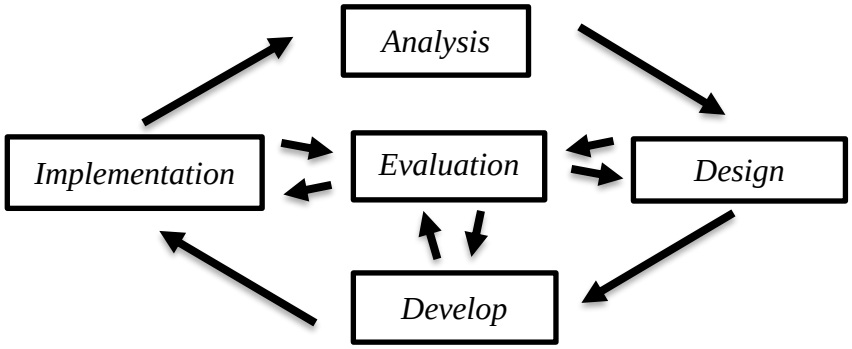


Figure 1. ADDIE model stages

Literature studies include observation, interviews with teachers and students, student needs questionnaires, media validation questionnaires, student learning interest questionnaires and pretest-posttests.

This study uses two data analysis techniques, namely qualitative and quantitative analysis. The analysis is obtained from interview activities containing input and suggestions, while the quantitative analysis is the acquisition of quantitative data from the distribution of questionnaires in accordance with the Likert scale as a measurement scale. For the interpretation of the Likert scale, it can be seen in table 1 below:

Table 1. Interpretation of Likert Scale (Suryadi, 2019)

Interpretation	Score
Strongly agree	5
Agree	4
Sometimes	3
Don't agree	2
Strongly Disagree	1

The next step is to assess the feasibility of a learning media to be implemented. To measure the percentage of validation value, the following equation is used:

$$Percentage = \frac{\text{total score obtained}}{maximum\ score}\ x\ 100\% \quad (1)$$

The validation results, the percentage of which is already known, are then matched with the criteria in table 2 below:

Table 2. Learning Media Eligibility Criteria (Saputra et al., 2023)

Score (%)	Category
< 21 %	Very Unworthy
21 – 40 %	Not feasible
41 – 60 %	Quite Decent
61 – 80 %	Worthy
81 – 100 %	Very Worth It

The percentage of students' interest in learning is measured using equation 1 and then the criteria for interest in learning are identified in table 3 below:

Table 3. Learning Interest Criteria

Percentage (%)	Category
90 – 100	Very high
80 – 89	Tall
65 – 79	Currently
55 – 64	Low
0 - 54	Very Low

(Sari, 2018)

Learning outcome data was obtained by pretest-posttest using N-Gain calculation to determine the increase in student learning outcomes. The N-Gain equation is as follows:

$$N\ Gain = \frac{posttest\ score - pretest\ score}{ideal\ score - pretest\ score} \quad (2)$$

After the N-Gain results are obtained, the next step is to calculate the student's score using the N-Gain percentage interpretation in table 4 and the N-Gain score in table 5 below:

Table 4. N-Gain percent criterion

Percentage (%)	Category
< 40 %	Ineffective
40% - 55%	Less effective
56% - 75%	Quite effective
>75 %	Effective

Table 5. N-Gain Score Criteria

N-Gain Value	Criteria
g > 0.7	Tall
0.3< g ≤0.7	Currently
g ≤0.3	Low

C. Results and Discussion

Analysis Stage

The first step, known as performance analysis, is to identify and categorize issues with the learning media already utilized in schools. Next, remedies are found by developing or enhancing the learning media.

The second step is requirements analysis, which involves identifying the learning resources that students require to enhance the caliber of instruction and learning outcomes currently offered in classrooms and then coming up with solutions by creating or enhancing learning resources.

Design Stage

Designing is the second action done. This learning resource's design process is viewed from the perspectives of language, material, and design before being constructed.

Development Stage

The stages carried out by researchers in developing media include:

1. make learning media
2. conduct a review of learning media by validating the learning media by a validator
3. improve learning media according to suggestions and input from validators.

The products resulting from the development stage can be seen in Figure 2 below:


Tetapi beberapa tahun terakhir perubahan musim di Indonesia sulit diprediksi


November masih kemarau
Mei masih hujan


Begitupun dengan peristiwa mencairnya es di daerah kutub, mencairnya es di kutub ini menyebabkab sebagian besar daratan tertutup air laut


MENGAPA HAL TERSEBUT DAPAT TERJADI?


Pemanasan Global?
Pemanasan global adalah meningkatnya suhu rata-rata atmosfer dan bumi


Gejala pemanasan global
Perubahan iklim
Banjir
Kekeringan


Apa penyebab terjadinya pemanasan global?
Polusi industri
Asap kendaraan
Penebangan dan pembakaran hutan
Penggunaan AC
Pembakaran sampah


Sebab-sebab itu tadi akan menimbulkan yang namanya efek rumah kaca


Dampak Pemansan Global
Contohnya suhu akan lebih meningkat karena panas matahari terperangkap di bumi dan perubahan musim yang tidak menentu
Perubakan iklim dan cuaca


Dampak Pemansan Global
Mencairnya es di kutub akan menyebabkan kenaikan permukaan air laut karena bertambahnya volume air laut
Kenaikan permukaan air laut

Figure 2. Powtoon Media Products

Implementation Stage

I incorporate educational media into the classroom instruction process. To find out how students react to the media utilized and whether they find the learning medium appealing, small and large group trials are conducted with students.

Evaluation Stage

Final product changes made in response to student feedback and ideas throughout the deployment phase.

Product Eligibility

A validation test was conducted on the Powtoon learning materials that will be created for the study in order to ascertain their validity. Three validators, including two professors and one instructor, conducted this validation test. This validation includes a feasibility test of the learning content/material, a feasibility test of the language used and a feasibility test of the media to be used. The purpose of media validation is to measure the level of feasibility of the media to be developed before being used in the development stage. Based on the validation of the Powtoon learning media to increase student interest and learning outcomes

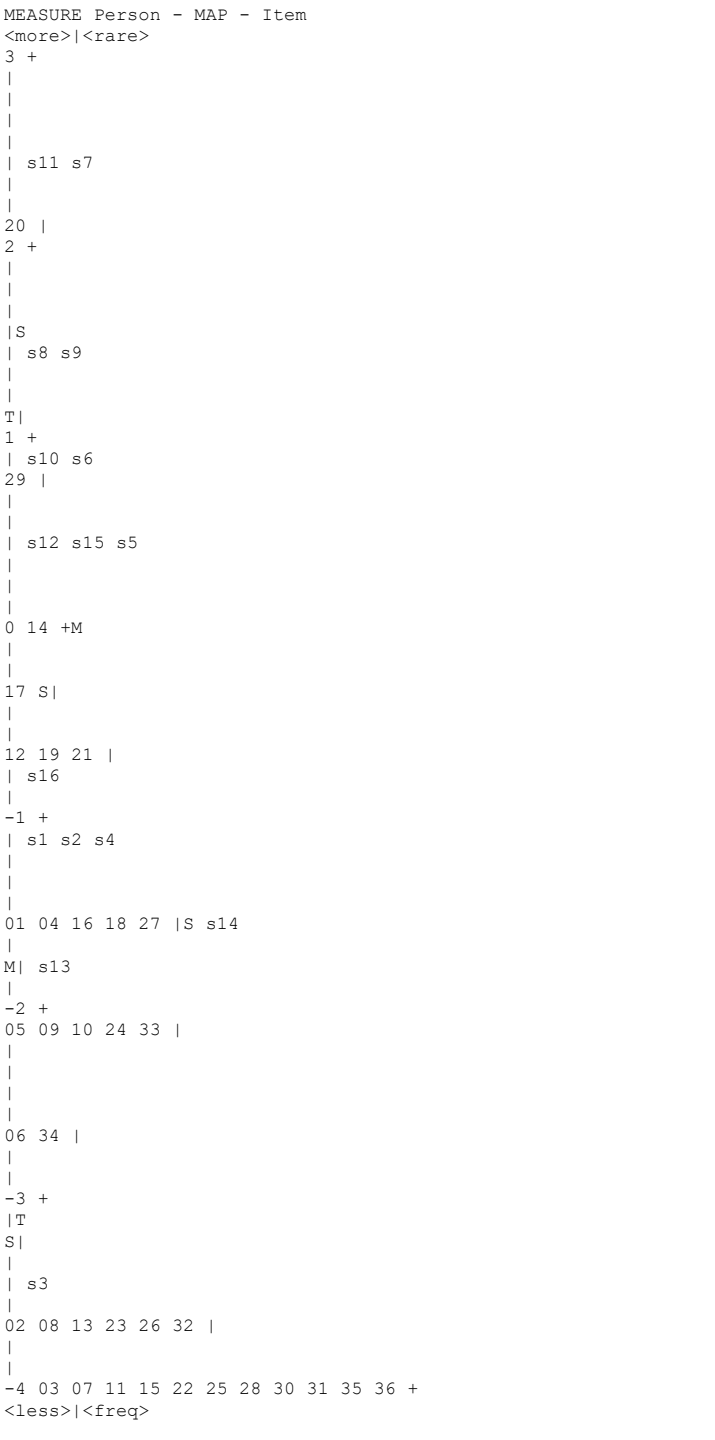
in global warming material carried out by three validators, the results showed that the Powtoon learning media was in the very feasible category with a percentage of 87.6% of the maximum percentage of 100%. Following the validator's validation of the generated product, it underwent revisions before to implementation.

Students' Learning Interest

The interest of students in learning after using Powtoon learning media increased, the interest of students was measured using an initial questionnaire of learning interest and a final questionnaire of learning interest. In the initial questionnaire of learning interest was distributed to students before using Powtoon learning media and the results of the initial questionnaire of learning interest were in the low category with a percentage of 55.2% of the maximum percentage of 100%. The final questionnaire of students' learning interest was distributed after learning using Powtoon learning media and the results of the final questionnaire of learning interest were in the medium category with a percentage of 73.4% of the maximum percentage of 100%. According to the results of the distribution of the initial questionnaire and the final questionnaire of students' learning interest, there was an increase in students' learning interest after using Powtoon learning media.

Based on the results of the analysis that has been done, the results of question items no. 11 and no. 7 in the initial student questionnaire have a high level of difficulty and question item no. 3 has the lowest level of difficulty, while in the final questionnaire analysis of student interest, question item no. 7 has a high level of difficulty and question items no. 3 and 4 have the lowest level of difficulty. Analysis of the student learning interest questionnaire with the Wright Map can be seen in Figure 3 below:

INITIAL LEARNING INTEREST QUESTIONNAIRE



FINAL LEARNING INTEREST QUESTIONNAIRE

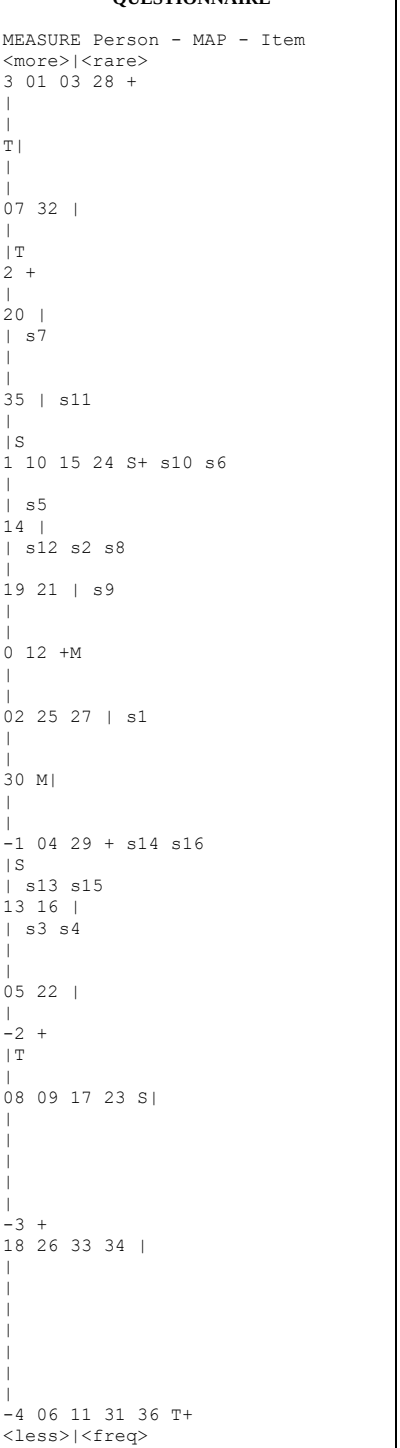


Figure 3. Analysis of Student Learning Interest Questionnaire with Wright Map

Student Learning Outcomes

The learning outcomes of students after using Powtoon learning media also showed an increase, these learning outcomes were measured using pretest and posttest with N-Gain calculations. From the N-Gain calculation, the results for the N-Gain score were in the moderate category with 0.69 and the N-Gain percentage was in the quite effective category with 69.5%. This is in line with research conducted by Nugroho that learning outcomes can be realized optimally if they produce changes in terms of knowledge

and behavioral changes due to interactions between students and students or students with the environment. From these results, it can be concluded that the use of Powtoon learning media can improve student learning outcomes in the learning process, especially physics.

D. Conclusion

Based on the results of the research and development that has been carried out, it can be concluded that:

1. Based on the results of the media feasibility validation sheet carried out by three validators consisting of two lecturers and one teacher, the results showed that the Powtoon learning media for increasing student interest and learning outcomes was in the very feasible category for use with a percentage of 87.6%.
2. Based on the results of the initial questionnaire and the final questionnaire of students' learning interest, there was an increase in students' interest in learning after using Powtoon learning media. The initial questionnaire of students' learning interest was in the low category with a percentage of 55.2% and the final questionnaire of students' learning interest was in the moderate category with a percentage of 73.4%.
3. Based on the results of the pretest and posttest with the N-Gain test as the calculation, the results obtained for the N-Gain score were 0.69 with the category moderate and N-Gain percent 69.5% with a fairly effective category.

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