

## Development of interactive powerpoint learning media based on information and communication technologies to improve student learning outcomes

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**Abstract:** Research conducted by researchers on the development of interactive PowerPoint learning media based on Information And Communication Technologies is based on conceptual and theoretical understanding using thematic learning that is felt to be not fully understood by students, this has resulted in decreased student learning outcomes. To solve problems in the learning process, learning media is needed. The purpose of this research is to implement the development of interactive PowerPoint media using ICT for fifth-grade students of SDN 1 Gamping. This media was developed in the form of several slides which are equipped with buttons that are inserted by hyperlinks in the learning menu so that it will make it easier for the user to go to the slide after the specified slide. This study used the ADDIE research model as a development model. The research findings showed an average material validity score of 80% (appropriate), an average language validity score of 92% (very feasible), and an average media validity score of 88% (very feasible). Calculation of media effectiveness based on n-gain obtained a score of 0.59 in the medium category. Responses to ICT-based interactive PowerPoint learning media were obtained from small-scale tests with an average score of 80% while field-scale tests obtained an average value of 86%, overall Student responses related to media can be said to be positive. So that the analysis data obtained states that ICT-based interactive PowerPoint learning media is effective in improving student learning outcomes.

**Keywords:** ICT-Based Learning Media, Interactive Powerpoint, Learning Outcomes

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### PRELIMINARY

Education in the 21st century brings a rapid flow of change so that it is known as the era of transformation in finding learning resources, in this case, the teacher is not the only source of learning and the function of the teacher is more than just conveying information. Teachers in the 21st century are creative educators because they can integrate the use of information and communication technology in educational activities. According to Rawung, et.al (2021); Rifa et.al., (2021). One of the challenges in the 21st century is the difficulty in integrating technology into the educational process. Teachers need to combine their knowledge, skills, and experiences to develop learning media by leveraging the advancements in technology. According to Moto (2019), it is explained that the rapid

development of technology and the widespread availability of information have had a significant impact on various types of media used as tools in the learning process. Therefore, teachers need to engage in continuous development and updates to keep pace with the evolving trends and demands of the current era.

The key element in ensuring the success of the learning process is the use of learning materials. As stated by Magdalena et al. (2021) and Launin (2022), the development of learning media in the field of science and technology (IPTEKS) refers to a set of tools used to disseminate educational information or concepts that are influenced by human involvement. According to (Nugroho, 2021) learning media is part of the embodiment of effective learning resources for students to get support in achieving learning goals. Efforts to realize effective learning resources for students require direct involvement. According to Wulandari (2022), learning media is part of a medium in any form used to deliver educational content to students, with the expectation that the material conveyed by teachers can be effectively communicated and understood by the learners.

The process of learning activities through educational units is dynamic, inspiring, exciting, and demanding, this can encourage students to actively participate in the learning process. According to (Junaedi, 2019) The learning process is an interaction between students, educators, and learning materials in a learning environment. The learning process is a systematic process that is deliberately created, giving rise to interactive learning between students and educators (Nurfaizah & Oktavia, 2020). From the explanations provided, it can be concluded that the learning process is a system designed by educators following the learning materials to serve as the foundation for teaching students.

The education curriculum in Indonesia often experiences changes and updates. Exactly, the changes in the education system are indeed adapted to the development and demands of the times. In Indonesia, schools are currently implementing the 2013 curriculum, which emphasizes an integrated thematic learning approach. According to (Buri, 2019) The thematic learning model emphasizes active and fun student participation using a theme-based approach. According to (Gandasari, 2019) Integrated thematic learning involves using themes to connect multiple disciplines and provide students with rich learning opportunities. According to the perspective above, thematic learning is teaching that uses a theme-based methodology to provide meaningful learning by focusing on the participation of students who are involved.

Utilizing the current scientific and technical advancements during the learning process can stimulate efforts to rejuvenate the world. The facilities offered by schools should be utilized by teachers, and if they are unable to do so due to inappropriate learning media, they should provide alternative materials. The reason for the need to initiate updates and developments is, of course, to enhance the quality of education. Information and Communication Technology (ICT) developed along with the times. According to Adiko (2019) and Wityastuti et al. (2022), computer-based instructional media are tools used to process, transmit, and load data or learning materials based on ICT, such as images, videos, and slides, which can be easily transferred across devices. They are employed to disseminate data or information in a manner that is simple for students to comprehend.

Problems in the field that occurred through observation and group discussion forums at SDN 1 Gamping found that understanding concepts through thematic learning was still difficult for students to understand. Teachers have not been able to maximize the thematic learning process, because there are limitations to the learning media needed, causing students to be less active in learning which has an impact on the cognitive domain to be able to meet the Minimum Completeness Criteria (KKM). Teachers have not implemented ICT-based interactive PowerPoint learning media into the learning process. Teachers still find it difficult to develop software-based learning media because it takes a lot of time so they just search for and download them via the internet. In addition to requiring considerable time to develop software-based learning media, careful preparation is also essential to achieve the desired objectives. The varying learning styles of students necessitate the use of learning media for assistance. The limited availability of thematic learning materials prompts teachers to seek alternative references.

Microsoft PowerPoint is a presentation application program in the form of slides. Through the development of interactive PowerPoint learning media, the researcher wants to combine several features of text, audio, animated images, and insert learning videos, in this case, into audio-visual form (Fitria, 2018; Gabriella, 2021). Making interactive PowerPoint learning media will be adjusted to the characteristics of students so that it makes it easier for students to understand learning material. This is in line with the explanation Inayah, (2020) explained that some standards for the use of good learning media include: 1) Media must convey information appropriate with its objectives and material; 2) Media must be adapted to the needs of students; and 3) Media must be supported by facilities and infrastructure.

The learning process should not be separated from good interaction between teachers and students. Activity in the learning process can be felt and can be seen if there is an interaction between the teacher and students in the learning process (Setiawan, 2021). The teacher's responsibilities in the learning process include conveying information and understanding, imitating attitudes, behavior, and values, as well as improving abilities to help students achieve better learning outcomes. The purpose of this study was to see the effectiveness of interactive PowerPoint learning media in increasing the effectiveness of student learning outcomes, especially in the cognitive domain to be able to meet the Minimum Mastery Criteria (KKM).

Based on the background description above, the researcher wants to develop interactive PowerPoint learning media based on information and communication technologies to improve student learning outcomes.

## METHOD

Research and development (R&D) was used in this research. Research and development techniques, usually referred to as R&D techniques, are research techniques used to develop and test the effectiveness of the resulting product. According to Sugihartini & Yudiana (2018), the ADDIE development model has the goal of producing a product and procedures that will be systematically tested in the field, which must then be evaluated and improved, which will be able to meet the expected indicators regarding standards, quality, and effectiveness implemented. Based on the description above, the Research and Development (R&D) model that forms the basis of researchers in developing learning media is the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) (Hidayat & Nizar, 2021).

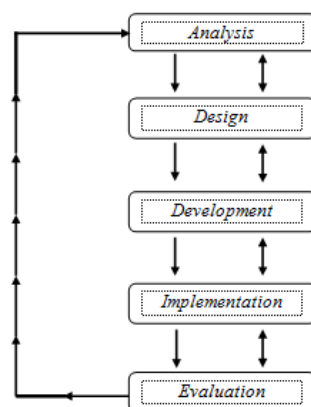


Figure 1. ADDIE model

Based on the ICT-based interactive PowerPoint media development model that will be used later, there are five steps in the procedure for developing interactive PowerPoint media, as follows: 1) Analysis stage, Researchers analyzed observation and discussion group forums at SDN 1 Gamping. Based on research findings based on observations and grub discussion forums, class V teachers at SDN 1 Gamping have not made or used interactive PowerPoint media in the learning process activities. The characteristics of students' learning styles are varied and the learning materials are conceptual so there is a need for learning media assistance. 2) The second stage is the design, when the researcher develops a media creation plan using ICT, starting with an interactive PowerPoint media creation framework. The preparation of an ICT-based interactive PowerPoint media framework refers to product specifications that have been developed previously. The design stages are as follows: Determining Main Competencies, Basic Competencies, and indicators, making flowcharts, compiling the initial product of ICT-level interactive PowerPoint media, Designing ICT-based interactive PowerPoint learning media, and Making testing strategies. 3) The stages of product design development that have been prepared are then developed based on the following stages, as follows: The developed media that has been made by the researcher is then re-corrected before being validated by the validator, Designing and creating product validation sheets for material experts, language experts, media experts, and student response questionnaires to media developed by researchers. Conducting expert validation, validating ICT-based interactive PowerPoint media by material experts, language experts, and media experts. 4) This implementation was carried out in 2 stages, the stages of implementation consisted of small group tests and large group/field tests. 5) The last stage is evaluation. At this stage, the researcher evaluates to indicate the level of success of the development of ICT-based interactive PowerPoint media, and whether there are still deficiencies and weaknesses in the application of the product or not. Evaluation is obtained after the application of interactive PowerPoint learning media. When there are no deficiencies, the media is appropriate to be used as a support for the learning process.

The instruments used in this study were interviews, tests, and questionnaires. Data obtained from all instruments will be analyzed using qualitative and quantitative data analysis.

1. Quantitative data analysis techniques

After collecting data from all respondents or data sources, quantitative data analysis was carried out (Sugiyono, 2016). The quantitative data analysis used by the researcher aims to analyze the data obtained from the validation questionnaire of media experts, language experts, and student response questionnaires. To test the feasibility of media developed by researchers obtained from the analysis of the validity of the media. Testing the appropriateness of developer media is the purpose of validation. The researcher tests the feasibility of the developed media through the results of media validity analysis. Validity testing is the purpose of the validation process. Validation questionnaires are administered to media experts, language experts, and material experts, as well as tests and questionnaires to gauge students' responses to the development of interactive PowerPoint media based on ICT. The validation process involves comparing the total score of respondents' answers (R) with the maximum total score (N). The results are then converted into percentages by multiplying by 100%. The formula is as follows:

The research quantitative data analysis technique aims to test the effectiveness of the implementation of ICT-based interactive PowerPoint learning media with thematic learning for class V SDN 1 Gamping. The data analyzed by the researcher is data from the results of the pre-test and post-test carried out during the research process in the learning process.

## 2. Qualitative Data Analysis

Qualitative data analysis techniques in this study were used to observe product development procedures and responses from research subjects involved in the study (Sugiyono, 2016). The researcher processed data from a questionnaire that included criticism and suggestions for ICT-based interactive PowerPoint media from material experts, language experts, and media experts using qualitative data analysis.

## 3. Analysis of the Efficiency of Interactive Powerpoint Learning Media

Gain index calculations are used to analyze the effectiveness of interactive PowerPoint learning media that have been implemented by researchers. N-Gain explains the difference between after and before the use of interactive PowerPoint learning media in improving student learning outcomes. The gain

score is said to be normal if it can show a positive level of effectiveness adjusted for the table of normalized gain criteria, the formula for calculating the gain is written as follows:

$$N - Gain = \frac{S_{post} - S_{pre}}{S_{maks} - S_{pre}}$$

Description:

*N-Gain* = Gain value

*S<sub>post</sub>* = Posttest Score

*S<sub>pre</sub>* = Pretest Score

*S<sub>maks</sub>* = Maximum Score

The N-Gain value obtained can be converted with the following criteria:

**Table 1. The Normalized Gain Criteria**

N-Gain Score	The Normalized Gain Criteria
N-Gain > 0.70	High
0.30 ≤ N-Gain ≤ 0.70	Medium
N-Gain < 0.30	Low

## RESULTS

### Expert Validation Recapitulation

Before the PowerPoint interactive learning media is implemented in the field, expert tests are needed including media experts, material experts, and language experts.

**Table 2. Expert Validation Recapitulation**

No.	Data source	Score%	Criteria
1.	Material Expert	80%	Valid
2.	Language Expert	92%	Very Valid
3.	Media Expert	88%	Very Valid
<b>Average</b>		<b>87%</b>	<b>Very Valid</b>

Based on Table 2, the results obtained are media validity with a score of 88%, language validity with a score of 92%, and material validity with a score of 80%. Based on the Likert scale, the percentage validation score obtained and the overall total obtained 87%, it can be concluded that the ICT-based interactive PowerPoint learning media developed by researchers is declared feasible to be used in improving the learning process.

### Student Response Test

The student response test was carried out in two stages, the small-scale response test it was applied to 10 fifth-grade students of SD Negeri 1 Gamping, with the following scores obtained.

**Table 3. Recapitulation of Anget Small-Scale Test Student Responses**

Average	$\Sigma R$	N	P	Criteria
	311	360	80%	Valid/Positive

Furthermore, the researcher carried out a student response test on a field scale which was applied to 48 class V students of SD Negeri 1 Gamping, with the following scores obtained.

**Table 4. Recapitulation of Anget Field Test Student Responses**

Average	$\Sigma R$	N	P	Criteria
	1141	1360	86%	Valid/ Positive

Based on Tables 3 and 4, the results from the small-scale test of students' questionnaire responses obtained a score of 80%, while in the field-scale test, the score obtained was 86%. When related to the criteria table, the student response scores fall under the category of positive and valid qualifications. From this calculation, it can be concluded that students are enthusiastic about learning using the interactive PowerPoint-based learning media with ICT.

#### Effectiveness Test

Data on student learning outcomes were obtained using the pretest and posttest of student learning outcomes. The comparison of learning outcomes between the pretest and posttest scores will serve as the basis for the researcher to determine the improvement in students' learning outcomes. The pretest will be administered to the students before any intervention or treatment, while the posttest will be given after the researcher's intervention or treatment. Effectiveness analysis was carried out by researchers using the N-Gain calculation formula. The N-Gain formula will show significant results regarding differences in student learning outcomes before and after the learning process takes place using ICT-based interactive PowerPoint learning media.

**Table 5. Learning Media Effectiveness Recapitulation PowerPoint interactive**

Average	Pretest	Posttest	N-Gain Score	Criteria
	77	83	0.59	Currently

Based on the results of calculating the N-Gain score in Table 5, the average score on pretest learning outcomes compared to the posttest average score showed that the



learning outcomes increase with a score of 0.59 when associated with the N-Gain table criteria, the calculation is included in the medium indicator.

## DISCUSSION

The purpose of developing this interactive PowerPoint learning media is to create media products that are useful and can be used to support the learning process of fifth-grade students at SDN 1 Gamping. To make it easier for students to access the desired pages, ICT-based interactive PowerPoint learning media were developed in the form of slides with menu buttons and navigation buttons. This research focused on the development of ICT-level interactive PowerPoint media for thematic learning in the fifth grade of SDN 1 Gamping. With the use of learning media in reflection has an important role in improving learning performance to improve learning outcomes (Liu, et.al, 2023). Media, material, and language expert validation is needed to validate the media so that it can be implemented in the learning process, expert validation is in the form of scores, comments, and suggestions to evaluate the media developed by researchers. After going through the validation procedure, the researcher made revisions related to the initial product so that it could become a valid final media product for use in the learning process. The final product, which is deemed suitable, will be printed in the form of a file and stored on a CD-R.

Based on the results of product development and testing, the interactive PowerPoint media is deemed suitable for use in the classroom's learning process. In terms of feasibility, the interactive PowerPoint learning media is considered highly suitable for implementation in teaching, as evidenced by the material validation with a validity rate of 80%, language validation with a validity rate of 92%, and media validation with a validity rate of 88%, so it can be concluded that it is very feasible to use. Based on the field test, the average pretest score for the interactive PowerPoint media was 77, while the average posttest score was 83. When calculating the N-Gain formula, which compares the pretest and posttest scores, the learning outcome improvement is found to be 0.59, falling under the "moderate" indicator based on the criteria table. Regarding the student response questionnaire, the small-scale test yielded a score of 80%, while the large-scale test obtained a score of 86%. Overall, the values indicate a positive response. Consequently, the interactive PowerPoint media integrated with ICT is highly effective, practical, and well-received when used in the learning process.

Based on the research and development presented above, a relevant study that aligns with the media development conducted by the researcher is a study conducted by another

researcher, Muhammad (2021), titled "Development of Interactive PowerPoint Learning Media for Listening Skills in Fiction Stories for Fourth Grade Elementary School." The findings from this study indicated that the PowerPoint media received valid results, with media experts stating 76% validity in the second round and a significant increase to 95.66% in the third round. The material experts' validation in the second round was 93.85%, while the validation by teachers as users resulted in 95.55%.

## CONCLUSION

Based on the results of research and development of ICT-based interactive PowerPoint learning media, the following conclusions can be drawn: Based on the findings of material validity, language validity, and media validity, ICT-based interactive PowerPoint learning media is feasible to implement. The results of student responses obtained positive results when viewed from the acquisition of small-scale and large-scale tests, as a whole from the acquisition of these scores included in the valid and positive indicators. The effectiveness test based on the large-scale test obtained a pretest value of 75 and a posttest value of 88, if the average is calculated using the N-Gain formula, an increase of 0.57 is obtained.

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