The Development of Android-Based PowerPoint Learning Media on Wave Material to Determine the Learning Interests of Class XI High School Students

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Abstract - *Technological advancements in education have enabled the development of more interactive and easily accessible learning media for students. One such innovation is the use of an Android-based PowerPoint application, which can be utilized both offline and online to enhance students' interest and engagement in learning. This study aims to evaluate the feasibility of using an Android-based PowerPoint application, measure the responses of students at SMAN 1 Lenek to the application, and assess the differences in students' learning interest before and after using this learning media. The research employs a Research and Development (R&D) methodology, following six procedural stages: problem potential analysis, observation and assessment, design and development, product testing, revision, and implementation. Data were analyzed using the ideal standard deviation method and normalized gain. The ideal standard deviation method was employed to assess the validity of the instruments evaluated by media and material experts, as well as to measure the students' responses to the application. Normalized gain was used to determine the change in learning interest scores from questionnaires distributed before and after the learning process. The results of the study indicate that the developed Android-based PowerPoint application successfully increased the learning interest of 11th-grade science students at SMAN 1 Lenek, with a gain score of 0.225, categorized as low. The students' responses to the use of this application were very positive, with an overall average score of 4.4. This research successfully developed an Android-based PowerPoint application that can be accessed both offline and online, contributing positively to the improvement of learning quality.*

Keywords: Learning Media; Development; Android PowerPoint

INTRODUCTION

The world of education is currently facing a big challenge in preparing students to face increasingly rapid globalization. Students must master technology and various skills that are relevant to current developments. This requires changes in the curriculum that can adapt to the needs of the globalization era (Jonassen et al., 2008). In addition, paying attention to students' learning interests is very important because low interest in certain subject matter can lead to poor understanding and low academic grades (Schunk et al., 2008). Therefore, it is important to develop learning strategies that are not only modern and relevant, but also attract students' interest.

In this context, the role of technology in education becomes increasingly crucial. The application of technology such as Android-based learning applications, including PowerPoint, can be one solution to increase student interest and involvement in the learning process. The use of interactive and easily accessible learning media can help bridge the gap between new curriculum needs and students' learning interests (Jonassen et al., 2008).

Research shows that the integration of technology in education can increase student motivation and learning outcomes (Alavi & Leidner, 2001). Thus, efforts to update the curriculum must be accompanied by innovation in teaching methods that are able to attract student interest, so that educational

goals that are holistic and in line with global demands can be achieved (Schunk et al., 2008).

According to Astuti (2015), Sardiman stated that interest is a condition that occurs when someone identifies characteristics that suit their own needs. Interest functions as a strong driving force in the learning process. Therefore, it is important for each individual to provide greater opportunities for the development of students' interests. Interest is also closely related to feelings of like or dislike, as well as attraction or disinterest.

Recent research shows that interest has an important role in motivating students to learn, especially in the context of the growing use of educational technology (Smith & Johnson, 2019). In addition, high interest in learning can improve students' understanding and academic results (Doe & Roe, 2019). Therefore, curriculum development and teaching methods must pay attention to student interest factors to achieve optimal results (Brown & Green, 2019).

Based on the 2013 curriculum guidelines, there are two methods for the learning process, namely direct teaching and indirect teaching. The direct teaching process is an educational process in which students develop knowledge, thinking abilities and psychomotor skills through direct interaction with learning sources or materials. In direct teaching, students carry out five main learning activities, namely observing, asking questions, gathering information, associating or analyzing, and communicating what they have found in analytical activities.

This curriculum development also has a good impact on students in the current digital era. Through direct teaching, students and teachers can apply learning styles by using good learning media, and, through indirect teaching, students can learn independently at home using devices owned by students, one of which is a smartphone. However, not all students and teachers carry out these activities. The use of PowerPoint, posters and animations in the learning process is very minimal, as is the use of devices such as smartphones in learning. In fact, smart smartphones can be used well if students know how.

Such is in line with the results of the author's observations at SMAN 1 Lenek. The use of learning media is very limited, be it the use of PowerPoint, posters, etc. Teachers are more active in class, teaching using the traditional method without tools in the form of learning media. Using very minimal learning media will make students' learning styles very lacking. Lack of learning styles has a big influence on students' interest in learning. The results of observations also indicate that students are not focused on using their smartphone devices. Students tend to be directed to make assignments at home using Microsoft Word software, such as writing papers or creating PowerPoint assignments. The application of learning styles using PowerPoint learning media is very limited due to the inadequate availability of facilities and equipment at SMAN 1 Lenek.

So, from this brief background, the author wants to try to develop an Android-based PowerPoint learning media on wave material. The result of this development can be used to determine students' learning interest at SMAN 1 Lenek.

RESEARCH METHODS

This research used the Research and Development (R&D) method with procedures developed by Brog & Gall, which had been modified according to needs by Masykur (2017). The stages carried out included identifying the source of the problem, observation, design and

development, testing, revision and implementation. The population of this study were students of SMAN 1 Lenek located on Jalan Dane Pahil, Lenek Daye, Aikmel District, East Lombok Regency, West Nusa Tenggara, with the research sample being students of class XI IPA 1. The students were asked to fill out an interest sheet to find out their interest in learning before and after using Android-based PowerPoint. The data collection instruments used included media and material expert validation assessment sheets, student response questionnaires, and student interest questionnaires. Expert validation sheets were used to obtain assessments from experts or lecturers to validate the results of product development. Student response questionnaires were used to obtain student feedback on product development, the results of which could be used as a basis for product improvement. Student interest questionnaires were used to measure students' interest in the product developed before and after use. Data from the questionnaire was processed and concluded using four decision-making variables: strongly agree, agree, disagree and strongly disagree. Data analysis was carried out using ideal standard deviation analysis and normalized gain analysis. The data analysis used was ideal standard deviation analysis and normalized gain analysis. Calculating the ideal standard deviation value = 1/6 (highest score - lowest score), while calculating the normalized gain is

$$\text{N-Gain } = \frac{final\ score - initial\ score}{\max score - initial\ score} \qquad (1)$$

RESULTS AND DISCUSSION

This development research focused on Android-based interactive PowerPoint learning media that was integrated directly with the teacher via email. This research used research and development methods which focused on developing Android-based PowerPoint learning media on wave material to measure students' interest in learning. Therefore, to support the development of the product, in schools, assistance instruments were used. Such instruments took the form of (1) validated learning interest questionnaires, (2) validated student response questionnaires, (3) syllabus and (4) lesson plans. The first stage in development research, namely the problem analysis stage, was the initial stage in this research. Such stage included the preliminary study stage: determining the object of discussion and determining the solution to the problem. This stage was also used by Shalikhah (2017) to get a picture of the actual field before the research was carried out. At this stage, a source of the problem was found, namely the lack of student interest in learning physics. Therefore, the solution offered for the problem found was the development of Android-based PowerPoint learning media on wave material.
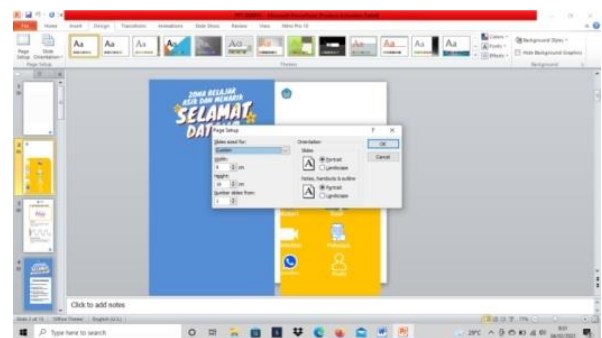

Figure 1. How to Adjust PowerPoint Slide Size

The second stage, namely observation, was used to observe the source of the problem at SMAN 1 Lenek school. These observations were carried out in April 2021 at SMAN 1 Lenek. Such observation showed that there were several facilities that were inadequate and unsupportive of the learning process in the classroom; there was no LCD and projector; teachers never used PowerPoint learning media in the learning process; students were more active in

playing on smartphones during the learning process. Based on these problems and observations, the author thus initiated an Android-based PowerPoint application that could be used by students in learning both online and offline. The lack of facilities such as LCDs and projectors at SMAN 1 Lenek could be overcome by implementing this application because this application was a manipulation of the PowerPoint learning media which requires an LCD and projector in the learning process.

The third stage, namely design and development, was carried out simultaneously using PowerPoint software on the computer. PowerPoint software developed by Microsoft allows users to be creative in making presentation slides in the form of videos or images. Referring to Mustika (2017)'s design results, all designs in this development referred to a good PowerPoint display. Therefore, the design and development process were first carried out by adapting the display form to an Android smartphone, that is, by clicking the design page setup menu, then adjusting it to a size 9x16 cm.

The fourth stage, namely testing, was carried out on December 4 2021 by the author. Group trial was then conducted on December 28 2021 at UNDIKMA. During trials, there were no hangs or errors when the Android-based PowerPoint application was operated. This trial stage included (1) answering questions, (2) playing simulations, (3) observing material, (4) writing errors and (5) the answer to the question sent to the teacher's email. The results of the five types of trials were very good and they were successfully carried out without any problems. The validation results

by media experts also stated the same thing, resulting in the "very good" category. Hence, it could be concluded that the Android-based PowerPoint application was suitable to be implemented.

The fifth stage, namely product revision, was conducted in order to perfect the research and development products. This stage included (1) revision of the instruments that had been validated and (2) revision of the Android-based PowerPoint application.

The sixth stage, namely implementation, was conducted on January 31 2022 in class XI IPA 1 SMAN 1 Lenek. At the implementation stage, students were directed to access and focus on learning with the help of the Android-based PowerPoint learning media. The results of the implementation were analyzed from the student response questionnaire and would become a reference to determine the quality of the implementation of the Android-based PowerPoint learning media as well as a reference for student interests through the questionnaire distributed.

The Android-based PowerPoint learning media that had been developed were then analyzed for its validity by media and material experts so that it could be considered suitable for use as a learning resource. Validity analysis was also done so that the researcher could determine the application/media's level of feasibility, so that it could be applied to students at SMAN 1 Lenek.

The overall results of the validation analysis for the response questionnaire, learning interest questionnaire, lesson plan, and application feasibility can be seen in the following table:

Table 1. Validation Score

No	Aspect	Total Score		$\bar{x}$	Category
		Expert 1	**Expert 2**		
1	Response questionnaire validation	14.17	13.84	4.67	Very good
2	Learning interest questionnaire validation	137	134	3.92	Very good
3	Lesson plan validation	34	33	4.79	Very good
4	Application feasibility validation	11.59	11.64	3.87	Very good

The results of the validation for the response questionnaire, interest in learning questionnaire, lesson plan, and the application feasibility was all very good, meaning that it could be implemented to the students. Based on the research construction, the author would measure students' interest in learning by distributing a learning interest questionnaire that had been validated by experts. The validation results for the learning interest questionnaire had a score of 3.92 (table 4.2), which fell within the "very good" category.

The validation results were used as a reference to determine the validity of an instrument that is suitable for application. The distribution of the student interest questionnaire was carried out in two stages. Stage I was distributed before the learning started, while stage II was distributed when the learning had ended.

The distribution of stage I student learning interest questionnaire was carried out on January 31 2022, while the distribution of stage I student learning interest questionnaire was carried out on February 8 2022. The questionnaires were distributed in class XI IPA 1 at SMAN 1 Lenek, to a total of 25 students.

The results of the questionnaire were then analyzed using the normalized gain method which aimed to determine the gain score of the questionnaire that had been distributed. The average score for all of the statements is as follows:
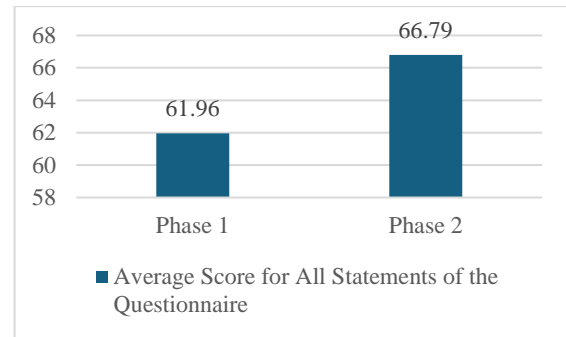

Figure 2. Average Score for All Statements of the Questionnaire

Based on the table above, the average score for the interest questionnaire was 61.96 for stage I questionnaire and 66.79 for stage II questionnaire. The following figure showss the N-Gain score for each statement, totaling 16 statements, all of which are marked "P".

The N-Gain score in the table above ranged from 0.04 to 0.38; this range indicated that there was an increase in student interest in learning in class XI IPA 1 SMAN 1 Lenek. This was proven by the total N-Gain score of 0.225. The total N-Gain score was obtained by dividing the sum of all item's N-Gain score by the number of items. Details of the entire analysis process can be seen in Appendix IV.

In this development research, the N-Gain score for students' learning interest was 0.225. From this score, it could be concluded that the use of the Android-based PowerPoint application could increase the learning interest of class XI IPA 1 students at SMAN 1 Lenek. It, however, was included within the low category.
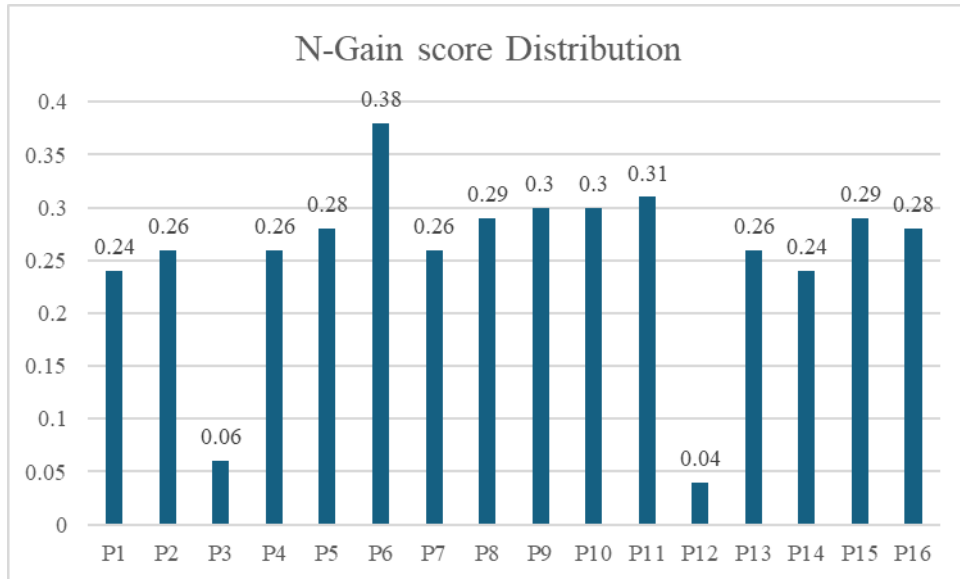
Figure 3. N-Gain Score for Each Statement

The student response questionnaires distributed to 25 students of class XI IPA 1 SMAN 1 Lenek resulted in a significant score, with a range of 4.04 to 4.76 for each statement. Such range would then be analyzed using the ideal standard deviation method which had been grouped to make assessment easier (table 3.2). The details of the assessment categories included (1) if $3.25 \leq\ < 4$ then it is categorized as "very good", (2) if $2.5 \leq\ < 3.25$ then it is categorized as "good", (3) if $1.75 \leq\ < 2.5$ then it is categorized as "not good", and (4) if $1 \leq\ < 1.75$ then it is categorized as "very bad". The author interpreted these details based on the interpretation of research conducted by Aji (2017).

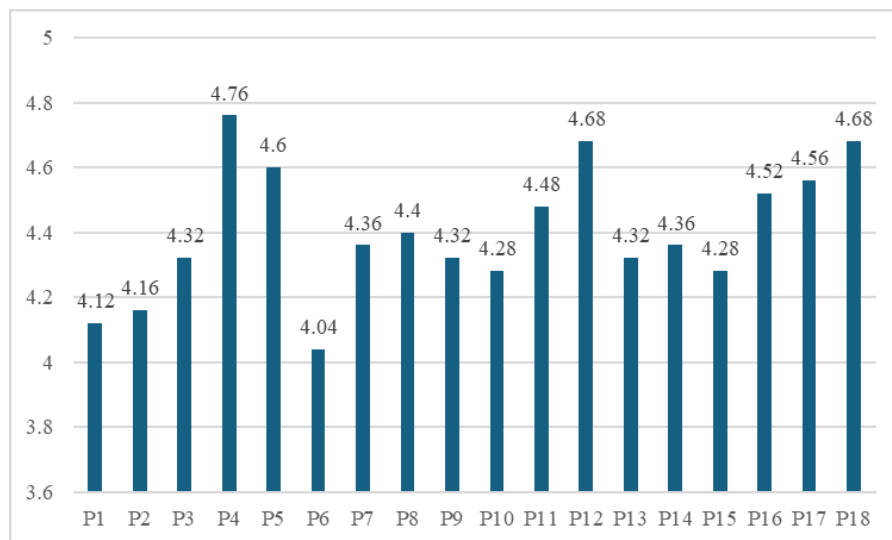The average score per each item can be seen in the table below, ranging from 4.04 to 4.76.

Figure 4. Average Score for Students' Response for Each Question

The results of the overall analysis of these items received a score of 79.20 with an ideal standard deviation value of 4.40.

Therefore, this application was categorized as "very good", the overall results of the

analysis of student responses to the use of the Android-based PowerPoint application.

CONCLUSION

The development of Android-based applications to increase students' interest in learning has become an interesting research focus. In this research, we found encouraging results regarding instrument validation, student responses, and the effectiveness of the applications developed. In this research, it was found that the Android-based PowerPoint application succeeded in increasing students' interest in learning in class XI IPA 1 at SMAN 1 Lenek. The results of instrument validation and student responses showed a very good success rate. This application can be accessed offline and online, opening up opportunities for further development in the future. However, special attention needs to be paid to reorganizing instruments and validation sheets according to the needs of research projects in the field.

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