

Optimizing Vibrant School Lampung Interactive Learning Media on Development Materials, Roots, and Logarithms

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ARTICLE INFO

Keywords:

Learning Media;
Logarithms
Roots;

Article history:

Received 2022-06-24

Revised 2023-03-01

Accepted 2023-06-26

ABSTRACT

This study aims to develop and analyze the effectiveness of PowerPoint learning media through the Smart School Lampung Berjaya virtual class application in improving the teaching and learning process, especially in development, roots, and logarithm material. This study used the ADDIE Development Research Model approach and was conducted at a state senior high school in Limau, Tanggamus Regency, with a sample of 30 students. Data collection techniques used observation, interviews, and tests, while data analysis techniques used qualitative research methods. Based on research, PowerPoint learning media products through the Smart School Lampung Berjaya virtual class application which have been validated by media experts, learning material experts, and mathematics teachers, as well as through student response tests, have proven effective in supporting the learning process. The results of this study indicate that the use of PowerPoint learning media through the Smart School Lampung Berjaya virtual class application can be a very effective tool in the teaching and learning process. The implication is that this media can be used to facilitate students' understanding of more complex material, such as development, roots, and logarithms, and can help increase the effectiveness of the teaching and learning process.

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1. INTRODUCTION

As the coronavirus emerged and spread around the world at the end of 2019, including in Indonesia (Astini, Sari, 2020), some students' perceptions of mathematics changed. They came to view it as a challenging, boring, and even frightening subject. This contributes to students' struggles with the

subject delivered and their consequent low maths achievement. According to the Kaspersky poll from 2021, the exact and natural sciences, including mathematics (48%), chemistry (28%), physics (25%), and biology (25%), are the most challenging for students in the Asia Pacific region to understand while studying online. As a result, many institutions had to suspend normal operations to prevent the spread of Covid-19. During the Covid-19 pandemic, even the Ministry of Education and Culture (one of the Governments) issued circular letter number 4 of 2020 instructing students to study from home via distance learning (Makniyah & Nasirah, 2021). Naturally, the aims of studying mathematics can't be attained without anticipating the aforementioned problems and responding appropriately to them.

Learning mathematics listed in the 2013 curriculum aims for students to have the ability to understand concepts, use patterns as conjectures in solving problems, use reasoning on properties, communicate ideas, reasoning and be able to compile mathematical evidence using complete sentences, symbols, tables, diagrams, have an attitude of respect, an attitude that is in accordance with the values in mathematics and its learning, carrying out motor activities and using simple teaching aids or technological results to carry out mathematical activities (Syahril et al., 2021).

According to (Budhiastuti et al., 2021), (Sari et al., 2020), one indicator of learning objectives is the responsibility of the teacher, which must be chosen and determined carefully to create a meaningful learning process. Education is like a forum for forming citizens who are intelligent and able to solve all life's problems, as is Indonesia's goal of national education to develop the potential of students to become human beings who believe and fear God Almighty, have a noble character, are healthy, and knowledgeable, capable, creative, independent, and become democratic and responsible citizen (Sujana, 2019).

A teacher is required to have sufficient knowledge and understanding of educational media as a means of communication in the learning process. Teachers must be skilled at choosing, using, and managing educational media, and be able to become intermediaries (media) in relations between students in the teaching and learning process (Indriyanti et al., 2020) (Abdullah, 2017). Even after the enactment of instructions to study from home, online learning is a solution to continue teaching and learning activities amid the spread of the coronavirus (Purwanti & Krisnadi, 2020). In terms of these challenges, teachers are expected to be able to develop students' potential and creativity even through online learning. So that students can have knowledge not only theory, but can practice it for the future in the development of the times. According to (Indriyanti et al., 2020), Learning media is an important element in the learning process; what are the problems in the world of education.

According to Efriana (2021) and Mahyoob (2021), Online learning is a solution for continuing to carry out teaching and learning activities during the pandemic (Susanti & Suswandari, 2021). Various kinds of learning applications have sprung up to support the learning process so that it remains effective (Aini et al., 2022), (Sani, Abdullah, 2022). Virtual Classes at Learning Houses are a Learning Management System (LMS) specifically developed to facilitate online learning between students and educators at anytime (Rahma et al., 2019; Mahfudhillah, 2022). At certain times scheduled by educators, students can take part in virtual learning with educators through synchronous communication tools (chat, video conference, audio conference, desktop sharing, whiteboard) (Belt & Lowenthal, 2022; Fitria, 2021).

Senior high schools in Lampung have felt the impact of the COVID-19 pandemic. Teachers as educators are starting to change learning strategies from face-to-face to non-face-to-face learning or online learning. One of the learning developments that will be implemented is learning using the virtual classroom application Smart School Lampung Berjaya. To keep up with the rapid pace of technological change, schools must embrace transformation in the learning paradigm from teacher-centered to student-centered, as Junaidi (2019) put it.

Various studies have shown the importance of using instructional media in the teaching and learning process. For example, Rasyid & Islamia (2021) found that using audio-visual media can increase students' learning motivation in social studies learning at SMP/MTS. Nasir (2022) found that the use of visual-based learning media can improve the learning outcomes of Indonesian junior high

school students. Then, Adityawati (2022) found that using media images through the jigsaw-type cooperative learning model can improve student learning outcomes in lesson theme 3 at MI Pancasila Sumberkembar. In the context of learning mathematics, research by Kamaruddin et al. (2021) found that the use of Moodle e-learning media can improve student learning outcomes in mathematics. Wijaya et al. (2020) found that the use of Hawgent Dynamic Mathematic Software media can improve students' mathematical abilities in trigonometry. Devia & Sahlani (2022) which emphasize planning, learning, assessment, and evaluation during the Covid-19 pandemic. Research Sani and Abdullah (2022), during online learning, students find it difficult to understand the subject matter, not to mention the relatively large number of assignments given by the teacher. Therefore, online learning makes students not happy with it. Research by Pertiwi & Sutarna (2020) has had the impact of changing the habit and culture of digital classes as part of online learning amid the Covid-19 pandemic.

However, research on the use of PowerPoint learning media through virtual class platforms, especially the Smart School Lampung Berjaya, in Indonesia's context of learning mathematics is still limited. This study seeks to fill this gap by developing and analyzing the effectiveness of these learning media in the teaching and learning process of developing materials, roots, and logarithms.

2. METHODS

The author uses Research and Development (R&D) research with the ADDIE Development Research Model. Research methods are used to produce new products or improve existing ones and can be accounted for in the future. The subjects in this study were 30 students of SMA Negeri 1 Limau. As the name implies, it is a model that involves the stages of model development with five development steps/phases, including Analysis, Design, Development or Production, Implementation or Delivery and Evaluations. The following is a modified flowchart to develop learning media for the Lampung smart school virtual class triumphing on exponentials, roots, and logarithms.

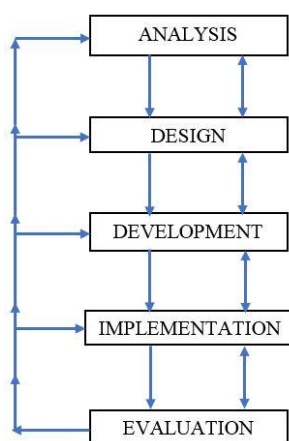


Figure 1. ADDIE Model Development Flowchart

At the analysis stage, the researcher analyzes student characteristics and learning problems, considering the learning media that will be developed in this study. Then, a competency analysis is carried out. This analysis is related to the competencies that students are required to achieve. Furthermore, researchers analyzed the School Facilities and Environment.

The second stage of design. At this stage, the researcher designs or designs learning media, starting from choosing the colour of the media, designing the cover, and the content of the material, up to the evaluation stage.

The third stage is development. After the learning media was designed, the researcher validated it with three experts in their field, namely the first, a computer science lecturer to see learning media with exponentials, roots, and logarithms and a mathematics teacher. The second is the mathematics

lecturer to see the suitability of core competencies and basic competencies in terms of exponents, roots, and logarithms.

The next stage is the fourth stage of implementation. At this stage, the researcher carries out teaching material that has been developed into real situations in the classroom. Implementation in this case, is intended to test the validity and feasibility of the product that has been developed.

The last stage is the evaluation stage. The evaluation stage is carried out with the aim of validating the learning media products that have been developed by giving solo exercises to students. The data analysis technique in this study was carried out qualitatively by looking at the percentage of the feasibility of learning media that would be calculated for four types of evaluators. First, material experts. Second, media experts, thirdly subject teachers and fourthly students as respondents. Calculation of the feasibility percentage of learning media uses the method exemplified by Sugiyono (Yuniasih et al., 2018).

$$\text{Percentage} = \frac{\text{skor obtained}}{\text{expected skor}} \times 100\%$$

3. FINDINGS AND DISCUSSION

The results obtained from the research have to be supported by sufficient data. The research results and the discovery must be the answers or the research hypothesis stated previously in the introduction part.

3.1. Analysis

The analysis carried out is related to the characteristics and problems of learning. Based on the data obtained from SMA N 1 Limau, it was found that students like things related to visual media, so it is necessary to develop ways to attract children's interest in learning mathematics in the material of exponents, roots and logarithms. Then in the learning process at SMA N 1 Limau, the learning process is still conventional, where in the learning process the teacher is still dominant using the lecture and question and answer method without any other variations of the model. In addition, teachers are rarely seen using innovative teaching materials, where the teaching materials used are only limited to textbooks, and media that is distributed directly from YouTube to students' WA groups.

Furthermore, the final analysis that the researcher did was on students' knowledge. Researchers analyzed students' cognitive development referring to Jean Piaget's theory. According to Jean Piaget's theory, the stages of individual intellectual development and changes in age greatly affect the individual's ability to observe science (Made Yoga Putra, 2015). At the age of 11-15 years, children can already think about and develop hypotheses for solving problems and drawing conclusions (Marinda, 2020). Based on this theory, it can be concluded that for the category of high school students, their cognitive abilities are higher than those of junior high school students.

3.2. Design

At the design stage, the researcher refers to the analysis that has been carried out, starting from choosing the color of the media, designing the cover, and the content of the material, up to the evaluation stage. The material contained in the learning media is designed based on students' cognitive abilities. The following is a learning media design that was developed.

Table 1. Designing the media (before and after)

before being revised by media experts	After being revised by media experts
	

3.3. Development

After the researcher designs the product being developed, the next stage is the activity of validating the product being developed which is carried out by the expert. The purpose of this development stage is to produce appropriate learning media after being revised based on experts, and limited response trials by students. The activities carried out by researchers at this development stage were validation of learning media carried out by two lecturers which included material experts, media experts and mathematics teachers. The media expert's assessment table is presented in the following table:

Table 2. the Validator analysis

Media expert assessment 1	Media expert assessment 2
Improve cover and display	The content of the material is clarified through pictures.
Add discussion questions	
Clarify the instructions on the media	

After validating by experts, the researcher revised the learning media that was developed. At the time of revising this product, all validators suggested revising the developed media. The fixes that have been fixed are presented in the following figure.



Figure 2. Valid media

After the researcher made revisions according to the suggestions from the validator, the next step was to do a limited trial by distributing student response questionnaires. At this stage, 10 samples of students were taken where students had studied the material exponents, roots, and logarithms.

3.4. Application

This stage aims to see the practicality of the learning media being developed. The practicality of the media can be seen from the media being tested on individuals or groups at the same time as in limited class trials. This is in line with the opinion of (Milala et al., 2022) The practicality of learning

media can be seen from the implementation of learning media in learning activities, teacher responses to learning media, student responses to learning media.

The trial of powerpoint learning media through the Smart School Lampung Berjaya virtual class application was carried out by testing on 10 students who had studied the material, so that the number of students required to conduct a power point learning media trial through the Smart School Lampung virtual class application Success is 30 students. During this limited feasibility trial, the product that will be displayed to students is power point media through the virtual class application, Smart School Lampung Berjaya, which has been revised according to expert advice.

The limited response assessment instrument for students consists of 12 questions consisting of 4 aspects, namely: display aspects, material aspects, learning aspects, and integration specs. The trial was carried out by providing opportunities for students to view and assess power point learning media through the Smart School Lampung Berjaya virtual classroom application. The results of the limited scale trials include: the results of students' responses to the developed learning media. The results of the analysis of student response sheets on the coverage of power point learning media through the Smart School Lampung Berjaya virtual class application developed by researchers have an average percentage of 95.57 which is in the very feasible category.

3.5. Evaluation

The final stage is evaluation; the researcher gives a test of student learning outcomes to determine the effectiveness of power point learning media through the virtual class application Smart School Lampung Berjaya which is given a material test to students to see students' ability to master the material during mathematics learning during the covid pandemic. Completeness of student learning outcomes can be seen in the following figure:

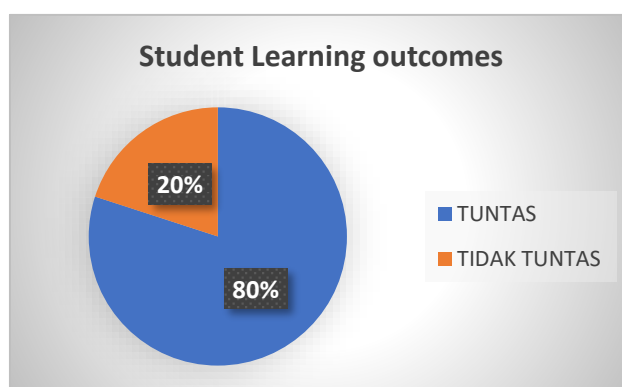


Figure 3. Students Learning Outcomes

Based on the results of the tests that have been carried out, 80% or 16 students meet the minimum completeness criteria (KKM) or complete of 30 students. So the learning media for the smart school Lampung Berjaya virtual class is effectively applied to exponentials, roots, and logarithms.

Discussion

The results of this study indicate that there is a positive effectiveness of using Power Point learning media through the Smart School Lampung Berjaya virtual class application in the teaching and learning process, especially in development, roots, and logarithm material. This is in line with Suryanti's research (2020), which found that the use of technology-based learning media such as PowerPoint can facilitate students' understanding of more complex mathematical concepts. In addition, these findings also support research by Aziz (2015) and Utami & Dewi (2020), which shows that interactive learning applications can increase student participation in the teaching and learning process. Through the Smart School Lampung Berjaya virtual class application, students can learn interactively, giving them the

opportunity to be more involved in the learning process and better understand the material being taught.

However, this research offers a unique contribution by combining PowerPoint with a virtual classroom platform. With this integration, this research not only confirms previous findings about the effectiveness of technology-based learning media, but also broadens our understanding of how this technology can be applied in more specific contexts, such as learning mathematics in Indonesia. Furthermore, the validation process carried out in this study, involving media experts, learning materials experts, mathematics teachers, and student response tests, provides a more comprehensive picture of the effectiveness of this learning media. The results of this study indicate that, despite previous research on the use of technology in education, there is still room for further research on how these media can be adapted and optimized for specific contexts and learning materials.

4. CONCLUSION

This research succeeded in proving the effectiveness of the integration of PowerPoint with the Smart School Lampung Berjaya virtual class platform in supporting the teaching and learning process of development, roots and logarithms materials. These results emphasize the importance of technology-based learning media in facilitating students' understanding of complex mathematical concepts and supporting interactive learning, thereby helping students to be more engaged and understand the material better. Through a validation process involving various parties, including media experts, learning materials experts, mathematics teachers, and the students themselves, this research provides a more holistic picture of the effectiveness of this learning media. This confirms that the application of technology in education must be considered carefully, paying attention to the specific context and learning needs of students, so that optimal benefits from this technology can be expected to support the achievement of better learning outcomes.

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