

Development of Problem-Based Learning Video Using Renderforest Application on Pythagoras Material

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ABSTRACT

This research is a type of Research and Development (RD) study. The objective is to produce a video-based learning medium assisted by the Renderforest application on Pythagoras material. The study employs the ADDIE (Analysis, Design, Development, Implementation, Evaluation) development model. The learning method used is Problem Based Learning (PBL). The instruments used in this study are test and non-test instruments. The test instrument for students' mathematical problem-solving skills consists of essay questions, while the non-test instrument is a questionnaire assessing students' learning independence. Data collected includes both quantitative and qualitative data. Product feasibility is measured through validation and practicality tests. Data collection techniques include interviews and questionnaires.

Keywords: Problem Based Learning (PBL), Pythagoras, Renderforest, learning video.

INTRODUCTION

Mathematics is a subject taught at all educational levels, from elementary to university. It plays a crucial role in education due to its abstract nature and the need for a good conceptual understanding. Understanding new concepts requires a prerequisite understanding of previous concepts, allowing knowledge to be built based on individual learning experiences, developmental stages, and surrounding environment. According to the 2006 National Education Standards, the goal of mathematics education is for students to understand mathematical concepts, explain the interrelationships between concepts, and apply them accurately, efficiently, and effectively to solve problems, which includes understanding problems, designing mathematical models, solving these models, and interpreting the obtained solutions.

Educators should manage the learning process to motivate students, foster creativity, and continuously innovate in providing learning materials and media. This is especially necessary in mathematics education, where students often become quickly bored. Cognitive development transitions from concrete operational thinking to formal operational thinking, meaning students may struggle with abstract thinking. Therefore, learning media is needed to support cognitive development. In mathematics education, media serves as a communication tool between educators and students to clarify abstract concepts.

Online learning involves using web networks, requiring educators to prepare materials using technology. Online learning poses challenges, such as difficulties in understanding material, engaging students actively, and using technology effectively in mathematics education. Developing learning media remains a common topic among educators and researchers. Some focus on developing learning modules, while others explore interactive media using current technological advancements. Interactive media can significantly aid learning activities. Additionally, some researchers develop learning media in the form of videos. Using Information and Communication Technology (ICT) based media can improve the quality of learning. To enhance learning effectiveness and efficiency, innovative and creative learning models should be developed to avoid monotonous and boring lessons that hinder knowledge transfer. Teaching materials play a vital role in delivering content effectively to students.

According to Hartanto (2016), e-learning is a technological development that can be used as a learning medium. It not only delivers content but also enhances various student competencies. The use of learning media is crucial in the applied learning method. One example of media implemented using educational technology is video-based learning. Suseno et al. (2020) state that animated learning videos significantly impact learning motivation. Nurdin et al. (2019) suggest that educational videos boost students' enthusiasm for learning activities, indicating that modern advancements positively affect students by providing video-based learning models that support learning activities. The new educational paradigm aims not only to change students' character but also to build integrity and a global mindset. According to Arsyad (2013), "Audio-Visual is a depiction or visualization of learning material narration packaged concisely." Designing and creating Learning Videos involves several stages, including organizing the material structure from the syllabus, structuring the Video Learning, collecting relevant data, and developing the video's appearance.

Permendikbud No. 65 of 2013 on process standards states that learning models appropriate for the 2013 Curriculum include inquiry-based learning, discovery learning, project-based learning, and problem-based learning. However, many teachers still do not fully implement the 2013 Curriculum. Effective learning requires supportive materials, such as teaching materials. Problem Based Learning (PBL) connects mathematical problems with real-life contexts, helping students develop thinking and problem-solving skills through real-world experiences.

PBL is chosen for mathematics education due to its relevance to discovery learning and mathematical skills. In mathematics, cognitive, affective, and psychomotor aspects are interconnected. The affective aspect relates to students' attitudes and emotions toward mathematics, while the cognitive aspect involves discovering important information or solutions to problems. The psychomotor aspect requires students to have good mathematical skills to solve problems. Teachers can guide students in investigating these problems. Developing these three aspects in students makes it easier for them to apply mathematical facts, concepts, and operations. Based on the described needs in mathematics education, this study aims to develop a video-based learning medium for teaching Pythagoras in schools.

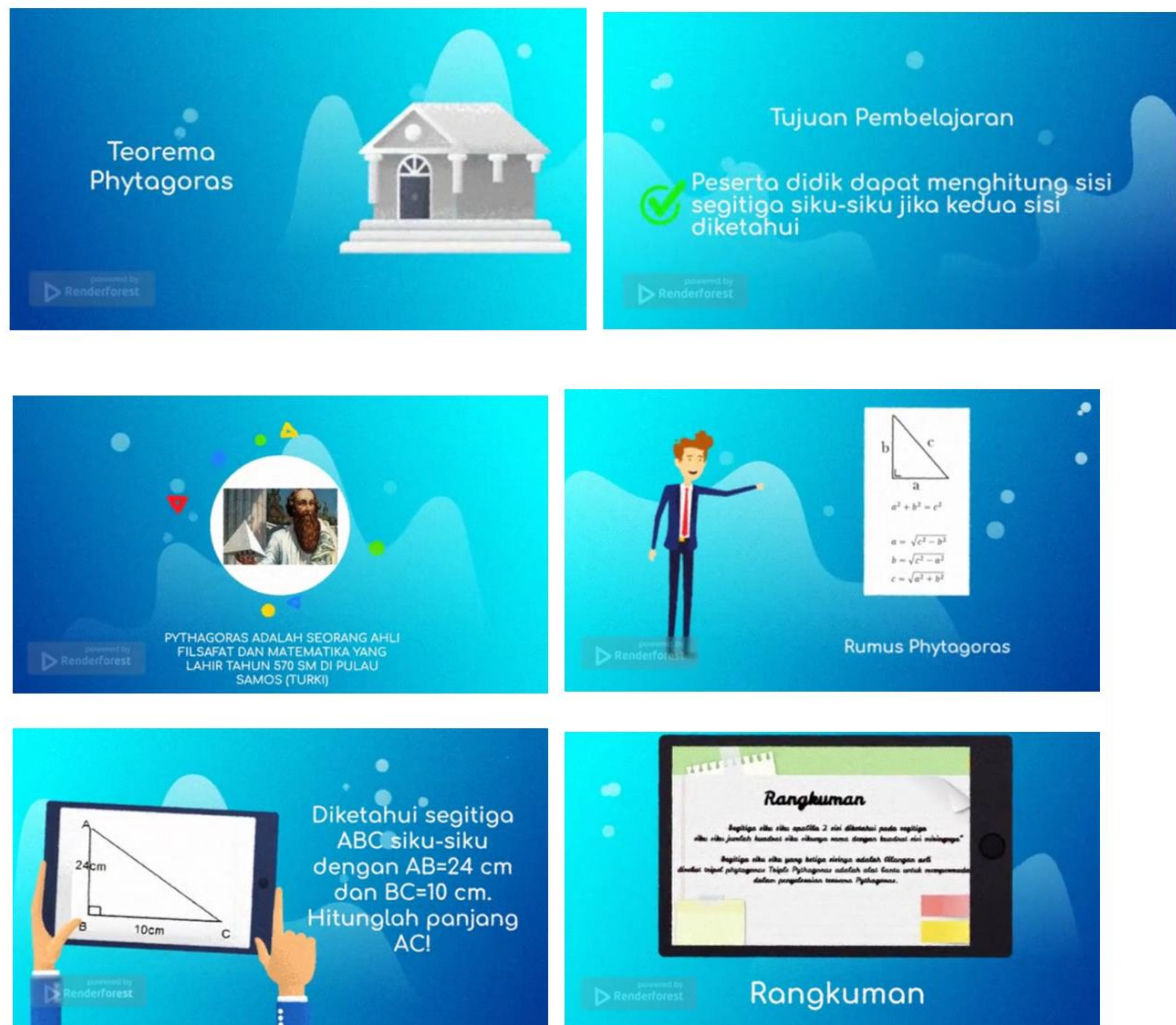
METHOD

This study employs the Research and Development (RD) approach to produce a video-based learning medium on Pythagoras for eighth-grade students. The learning objectives include solving problems related to Pythagoras. The Problem Based Learning (PBL) model involves students in projects to produce a product. Given the abstract nature of mathematics, appropriate learning methods are needed to help students understand the subject effectively. According to Ruseffendi (2006), "Mathematics is considered a difficult, complex, and challenging subject." The teaching method used is discussion, where students interact, exchange opinions, and defend their views on problem-solving to reach a consensus.

The research process includes planning, production, and evaluation. In the planning stage, the product is designed based on needs analysis through interviews with educators and literature studies. The production stage involves developing a PBL-based video on Pythagoras using the Renderforest application. In the evaluation stage, the product is assessed by expert judgment until it reaches validity. Product feasibility is measured using Beta Testing or product usage testing. Data collection techniques include questionnaires with Likert scales completed by respondents.

RESULTS

This stage involves designing the product by selecting the media and format for development. The chosen medium is a learning video assisted by the Renderforest application. The video-based learning format aligns with the chosen media, and the presentation format is adjusted accordingly. The video-based learning medium using Renderforest is structured as follows:



CONCLUSION

The study successfully developed a video-based learning medium on Pythagoras for eighth-grade students, providing an innovative teaching resource. The video, created using the Renderforest application, is an effective learning tool. Further development of video-based learning media into applications is suggested to enhance students' learning motivation and understanding.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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