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Development of mathematics learning in the form of animation using Canva

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Abstract

This research aims to produce a mathematics learning video and determine its validity and practicality. In this research, the researcher used Canva to create animated mathematics learning videos with the material of flat-sided cube and rectangular prism. The development uses the ADDIE model which consists of: analysis, design, development, implementation, and evaluation. The research subjects were 28 eighth-grade students in the second semester of the 2023-2024 academic year. The data collection methods used were tests and questionnaires, accompanied by documentation. The results of this study are that the produced media is feasible, useful, and has the potential to be influential. The evaluation results from the media experts stated that the video material is very good, with a percentage score of 81.25%; material experts stated that the video material is good, with a percentage score of 95.83% in the very good category; language experts stated that the video material is sufficient, with a percentage score of 89.28% in the very suitable category. In addition to the evaluation of student questionnaire responses, 88.24% of respondents at that time stated "very interested".

***Keywords**: Development, Animated video media using Canva*

Abstrak

Penelitian ini bertujuan untuk menghasilkan suatu video pembelajaran matematika dan menentukan kevalidan dan kepraktisannya. Dalam penelitian ini, peneliti menggunakan Canva untuk membuat video animasi pembelajaran matematika dengan materi bangun ruang sisi datar kubus dan balok. pengembangannya menggunakan model ADDIE yang terdiri dari: analisis, desain, pengembangan, implementasi, dan evaluasi. Subjek penelitian ini adalah siswa kelas VIII semester genap tahun ajaran 2023–2024 sebanyak 28 siswa. Metode pengumpulan data yang digunakan adalah tes dan angket, disertai dengan dokumentasi. Hasil dari penelitian ini yaitu media yang dihasilkan layak, bermanfaat, dan berpotensi berpengaruh. Hasil penilaian pakar media menyatakan bahwa materi video di atas sangat baik, dengan persentase penilaian sebesar 81,25%; pakar materi menyatakan bahwa materi video tersebut baik, dengan persentase penilaian sebesar 95,83% dalam kategori sangat baik; pakar bahasa menyatakan bahwa materi video tersebut cukup, dengan persentase penilaian sebesar 89,28% dalam kategori sangat layak. Selain penilaian tanggapan angket siswa, sebanyak 88,24% responden saat itu menyatakan “sangat berminat”.

Kata Kunci: Pengembangan, Media video animasi menggunakan Canva

INTRODUCTION

Mathematics has an abstract, logical, and systematic nature (Desiani et al., 2022), making it a compulsory subject in schools. Mathematics is a branch of knowledge that is often perceived as dry, abstract, theoretical, and full of confusing symbols and formulas. Negative experiences with mathematics in school have led to negative attitudes towards the subject among students (Sadewo et al., 2022).

Mathematics is often considered a frightening subject for children (Aprilia & Nur Fitriana, 2022; Mustika, 2022; Patahuddin & Rokhim, 2013; Richardo, 2017; Sudarman, 2021). This theory highlights students' short attention spans for the topics being studied. This is related to students' interest in mathematics, as interest is closely linked to attention and can stimulate learning. Low motivation to learn mathematics can be caused by weak mathematics skills (Prasetyo & Dasari, 2023; Rigusti & Pujiastuti, 2020). Mathematics is a compulsory subject in all educational programs. Several studies have shown that students' enthusiasm for learning is a major factor influencing their mathematics learning outcomes (Septian et al., 2023).

Since everyone has a unique learning style, the use of videos can accommodate these diverse needs. Furthermore, instructional videos help educators minimize their reliance on overly didactic approaches during the teaching and learning process (Agustini & Ngarti, 2020). It is expected that educational videos will arouse students' curiosity, inspire them, and give them a comprehensive understanding of the material being discussed. Through learning videos, students are gently encouraged to develop their skills, gain a deeper understanding of the real world, and become more independent learners (Sadewo & Purnasari, 2021).

Before the research was conducted, the researcher observed and interviewed mathematics teachers regarding the teaching and learning activities that took place. From these results, it was revealed that during teaching and learning activities, teachers never used video media. As a result, learning activities relied on the available textbooks.

Learning media that can motivate students is very important to attract their interest in learning mathematics (Batubara & Ariani, 2016; Saragih, 2019; Suardi et al., 2023). To increase students' interest, motivation to learn, and cognitive capacity, the right learning materials must be used. One effective way to improve the mathematics learning process is to use videos as a source and learning tool (Wulandari et al., 2020). Video-based tools can be very useful in both face-to-face and distance learning, and can help increase students' motivation to learn.

Canva is a design platform that can be used through PCs and android devices. Various design formats are available in the program such as Powerpoint presentations, resumes, flyers, brochures, infographics, banners, certificates, YouTube thumbnails, and many more. Canva offers a variety of presentation format variations. Teachers can create videos using the Canva program as a learning tool. The goal of using Canva as a learning resource is to make learning interesting and dynamic, rather than boring or repetitive, and to improve students' understanding of the information taught to them. This can support children in using their creative thinking to solve problems during the learning process, especially in mathematics class, which is considered challenging for some students.

The use of mathematics learning videos is very appropriate and can improve student learning outcomes (Yandani & Agustika, 2022). Learning videos can help students learn mathematics more successfully, which can increase their enthusiasm and engagement in beneficial learning activities. Learning videos can help in the teaching and learning process by increasing learning motivation and understanding of the subject matter (Irmawati et al., 2022).

METHOD

This research is classified as "development research." The primary objective is to create a product and evaluate the quality of the final output. To teach mathematics using Canva, the researcher created animated videos. The ADDIE model, which stands for analysis, design, development, implementation, and evaluation (Mumpuni et al., 2023), served as the framework for this development. The product of this research is the development of animated mathematics learning video media using Canva.

The research subjects were 28 eighth-grade students in the second semester of the 2023-2024 academic year. The research topic was derived from the material "spatial structure of plane figures" which served as the focus of this study.

The researcher employed a methodology developed by Branch (2010). The ADDIE research paradigm, consisting of five phases: analysis, design, development, implementation, and evaluation, formed the basis of this research approach and study. Tests and questionnaires were used as data collection methods. The stages of the ADDIE model are outlined below:

Analysis

This initial stage involved several analysis steps. To analyze the performance gap of the existing problem, the researcher first identified the problem, then determined the solution, and finally determined the answer (Branch, 2010). Setting learning objectives: after identifying the problem, the next step was to set objectives based on the results of the

examination, including assessing the prerequisites for development as well as the feasibility and problem-solving skills required to design instructional media. The researcher went through two steps in the needs analysis process: curriculum analysis and needs analysis. Therefore, the researcher's objectives based on the conducted research are as follows: a) Examination of the actual needs for instructional media possessed by students who are the target audience for the development of instructional media; b) Examination of the curriculum used by school. By using Canva, the research modified the content of the material to be included in the animated learning video for mathematics.

Design

At this stage, the developer analyzed the data and formulated a development strategy. The objective was to utilize Canva to create animated video content for mathematics education. The specific steps involved selecting animations, templates, and backgrounds that complemented the lesson material, ensuring that the created media was engaging and attention-grabbing for students.

Development

The development stage is carried out to produce media that is suitable for use as learning media. Development is carried out through several stages. The first video media was created based on the researcher's idea, then the supervisor was consulted regarding the results of the initial product created, namely mathematics learning video media in the form of animation using Canva. Animated video created with Canva, based on a researcher's idea.

At this stage, researchers have created and edited learning video material, which is then sent to media experts, material experts and language experts to be evaluated or validated regarding elements of validity. Researchers will use Canva to create animated mathematics learning video media, and the validation results will be used to improve it. To gather ideas and input before the next step, the evaluation was conducted in small groups once again.

Improvements that will be given by the supervisor regarding the initial product that we are making for the first time, if we have revised the initial product according to the supervisor's suggestions. The researcher developed a video using Canva combined with Pixton to create the desired avatar animation with a long duration of each learning video of 10-15 minutes. Next, they continued with the assessment by an expert validator which was carried out until it was suitable for use without revision, continuing to the small group trial stage that would be available. revisions of suggestions and comments given to the small group. After carrying out expert validation and completing revision after revision, it will be tried out to the next stage in a large group (field test).

Implementation

This stage is a continuation of the development stage. At this stage, based on development procedures, at this development stage a trial will be carried out, namely a large group (field test). This stage is carried out to get students' impressions regarding the achievements of the media.

In this stage, the learning videos that have been developed and revised and approved are tested by language experts, material experts and media experts. The trial stage is carried out on subject, which consists of 28 students. Students then complete the LKPD and media evaluation questionnaire.

Evaluation

Evaluation Stage: To ensure the effectiveness of the media developed in the learning context, the media is reviewed or assessed at the evaluation stage, which is the last phase in the ADDIE stage. The purpose of this evaluation stage is to ensure the quality of the product and the learning process that can be applied both before and after implementation (Branch, 2010). This assessment process can ensure product quality by considering factors related to perception. Examples include tracking students' progress toward capability development goals by having them participate in educational activities and the profits the school derives from students' improved skills through ongoing product development.

RESULTS AND DISCUSSION

The goal of this development is to provide a valid and useful animated video media for junior high school mathematics education, specifically for the eighth grade, using Canva, with a focus on rectangular prisms and cubes. This research is categorized as development research. Using the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The first step taken by the researcher is called the Analysis Stage, which involves identifying problems that arise in the classroom, such as a lack of learning media used. The Design Stage is where the researcher designs an animated mathematics learning video media using Canva according to the school's needs. The Development Stage is where the researcher produces the product according to the previously designed plan. The Implementation Stage is where the researcher conducts a field test. The final stage is the Evaluation Stage to assess the tested product.

In the analysis stage, the researcher collected data from the school by conducting direct observation and interviews with mathematics teachers at school. This information related to the learning media used during the teaching and learning process, which was limited to textbooks and lecture methods, especially for the material on rectangular

prisms and cubes. The presence of this additional teaching material greatly helps students understand the material being studied and increases students' enthusiasm and involvement through the use of mathematics learning videos created with Canva, which are animated and visually appealing.

Design stage: during this stage, the researcher created a basic layout for the media to be produced, including the animated characters to be used, the templates to be used, and the content. If the design was deemed inappropriate, revisions were made. Several programs were needed to be developed during this design process stage. The Pixton application was used to create the desired animated avatar images. In addition, Canva software functioned as the main tool for creating animated educational videos about mathematics.

Development stage: at this development stage, the researcher began producing the media. This stage involved collecting resources for animation creation, selecting templates, dubbing, photos, materials, student worksheets, video playback speed, and closure. In addition, at this stage, the created and updated video learning content according to the suggestions and input of the supervising lecturer was sent to media experts, subject matter experts, and language experts for evaluation or validation of its validity. In addition, the researcher prepared and provided an evaluation sheet containing questions addressed to the experts. The following are the results of the validation of prototype 1 by the three experts.

Based on the stages of the media feasibility test, the animated mathematics learning video media using Canva was deemed suitable for use without revision with a percentage score of 81.25% compared to the previous one which was suitable with minor revisions. Meanwhile, the results of the material expert feasibility test showed that although the animated mathematics learning video media created using Canva was good and could be a new source of inspiration in creating learning materials in junior high schools, especially Islamic junior high schools, there were still some things that needed to be improved. To make the experts consider the animated mathematics learning video media developed using Canva suitable for use after being revised, the created animated mathematics learning video media was returned to the experts for revalidation. The experts reported that the animated mathematics learning video media created could be used without modification with an approval rate of 95.83%.

Meanwhile, the results of the language expert trial In this case, the language expert commented that the animated mathematics learning video media using Canva that was developed was good, but there were some things that needed to be improved related to

pronunciation, intonation, and the writing of language in the animated mathematics learning video media using Canva that was developed. Otherwise, and overall, the animated mathematics learning video media using Canva that was developed was stated to be suitable for use with many revisions, and after making revisions, the animated mathematics learning video media using Canva that was developed was given back to the experts for revalidation, and the language expert stated that the animated mathematics learning video media using Canva that was developed was stated to be suitable for use without revision with a percentage value of 89.28%.

Meanwhile, the findings of the language expert trial in this case, the expert noted that although the animated mathematics learning video created using Canva was good, there were some areas that needed improvement related to writing, intonation, and pronunciation. The expert determined that, overall, the animated mathematics learning video using Canva that was developed could be used with many revisions. After the revisions were made, the expert revalidated the animated mathematics learning video using Canva that was developed, and the language expert stated that, with a percentage value of 89.28%, the animated mathematics learning video using Canva that was developed could be used without revision.

For this implementation stage to be carried out, the animated mathematics learning video created with Canva must be modified appropriately so that it can be used and distributed to students. A total of 28 students filled out nine indications on the scale, which was based on the results of data analysis and the results of student field tests. As a result, the student field test criteria produced results with a percentage of 94.54% and the result of "very interested" when converted to a scale of 4. According to students, the learning video greatly helped them in understanding the material, as it could be played repeatedly (Ardiman et al., 2021; Arigiyati et al., 2021; John, 2020). In addition, the sound and images also made students more interested (Biassari & Putri, 2021; Mardiana et al., 2023; Rahmalina et al., 2020). Based on the implementation results, the animated mathematics learning video created with Canva was considered valid and beneficial overall.

CONCLUSIONS

The validation results and student responses to the animated mathematics learning video media using Canva show positive results. The feasibility of the Development of Animated Mathematics Learning Video Media Using Canva is considered very good according to Media Experts with a percentage score of 81.25%. Material experts also

stated that the developed learning video media is good with a percentage score of 95.83% and is categorized as very good, and language experts also stated that the developed learning video media is good with a percentage score of 89.2% and is categorized as very suitable for use. At the Implementation stage, the student response to the animated mathematics learning video using Canva involving 28 eighth-grade students, of which 15 were male students and 13 were female students. The accumulated value of the students' responses was categorized as very interested with a percentage value of 94.54%.

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