

## Development of CORE Model-Based Mathematics Learning Videos For Grade VI Students at SDN 1 Kaba-Kaba

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### Abstract

Media is helpful in providing meaningful learning activities through the application of the CORE (Connecting, Organizing, Reflecting, and Extending) model as a learning video scenario. This study aimed to determine the build design of the CORE model-based mathematics learning video and to determine the feasibility of the CORE model-based mathematics learning video for sphere material for sixth-grade students at SDN 1 Kaba Kaba. Media design used the ADDIE model (ADDIE (analyze, design, development, implementation, evaluation) as a step in the product development process. The study did not use a population or sample but used test subjects learning content experts, learning design experts, learning media experts, and grade VI students at SDN 1 Kaba Kaba. Data collection method used was a questionnaire method, observation, and interviews. The research data results were analyzed using a quantitative descriptive method by looking for the eligibility percentage in the learning process through the trial results. Thus, it generated learning video products, including as follows. There were design descriptions of the CORE model-based mathematics learning video development with stages of analysis, design, development, and evaluation. CORE model-based learning videos based on product trial results, including as follows. The assessment results of learning content experts with the acquisition of very good qualification percentage score (95.20%); the assessment results of the learning design expert with the acquisition of very good qualification percentage score (90.55%); the assessment results of the learning media experts with the acquisition of very good qualification percentage score (95.54%); and the student assessment results through individual trials obtained very good qualification percentage score (90.35%). Based on the trial results, it can be concluded that CORE model-based learning videos were feasible to use in the learning process.

**Keywords: Learning Video; CORE; Mathematics**

### Introduction

Education is the learning of knowledge, skills, and habits of a group of people passed down from generation to generation through teaching, research, and training. The importance of education is often underestimated. In addition, as a means to broaden knowledge, education can hone skills in solving problems, boosting the economy, and creating better job opportunities. The importance of education should not be underestimated and should be instilled from an early age. People are aware of the importance of education by constantly trying to improve their quality of education and equip themselves with various knowledge and skills. Gaining knowledge and skills can certainly be passed through the learning process. The learning process at school is interaction activity series that involve various learning components to achieve learning

objectives (Pane & Darwis Dasopang, 2017). The achievement of a learning objective can be seen from the successful implementation of strategies, approaches, models, and methods in learning planned by the teacher so that learning activities can run well for students. The existence of a meaningful learning process is a learning activity that facilitates students to be able to associate new knowledge to be learned with the knowledge that students already know or have learned. With this associating activity, students not only learn to memorize all the concepts, facts, and generalizations learned (rote learning), but students can connect concepts that are already known and learned with the associating or connecting process. Thus, students are able to think actively and construct their knowledge. Therefore, students learned the concepts as a whole, meaningful and uneasy to forget.

In learning mathematics, students still often get used to learning by memorizing. It can be memorizing facts, formulas, and other concepts, so it cause students to be accustomed to hoarding information without being able to interpret it. According to (Mulyono & Hapizah, 2018), learning mathematics by memorizing, which students do not reach the stages of using memorized knowledge, so students do not have an understanding of material concepts. Students who do not have mathematical concept abilities think that mathematics is a difficult subject to understand because it requires very strong numeracy skills and memory. PISA (Program for International Student Assessment) results are assessments of international students in the fields of science, mathematics, and language. 72 countries involved as participants, Indonesia was ranked 65th in the field of mathematics from the PISA results in 2015 (Argina et al., 2017).

It shows that students' mathematical abilities are still low in understanding concepts. It is caused by various factors, namely internal factors and external factors, such as the way teachers teach, both from methods, media, learning resources, and those related to the process of learning mathematics. Based on interviews with grade VI teachers at SDN 1 Kaba Kaba, there are obstacles experienced in the current mathematics learning process during the pandemic. Teachers experience problems explaining mathematical material in detail by presenting the basic concepts of the material through online learning. As an alternative, teachers use learning videos from YouTube because of the limited time to develop learning videos. However, the problem is that the available mathematics learning videos have not been able to facilitate students to learn to understand mathematical concepts through meaningful learning activities.

The available learning video content is the same as the students' math book content. It provides learning activities by rote learning because they only directly provide information to students in the form of formulas and examples to answer questions. It causes students easily forget the material to be studied. Students who have low abilities will get scores below the KKM/MCC (Minimum Completeness Criteria). It shows the gap in the process of good mathematics learning activities for students in elementary schools. According to (Siagian, 2016), mathematics is a systematically arranged science that the concepts studied are interrelated between one concept and another. Thus, there must be learning activities in learning mathematics to connect or relate the concepts studied by students so that students can understand. Learning mathematics contained in geometry material, especially geometric shapes, has a very important role when applied to life. Understanding the basic concepts of geometric shapes needs to be taught since students are in elementary school (Kurniasih, 2017).

According to (Sholihah & Afriansyah, 2018), geometric material has a strong relationship with geometric concepts. The intended geometry is the geometric shapes found in the flat side shapes and the curved side shapes. Understanding the concept of curved side shapes will be more complicated than flat side shapes, especially in a

spherical shape, looking from the shape of the spherical shape, which only has one curved side plane, if not give a concrete concept understanding. Thus, students are challenged to understand the concept of geometric shapes.

Based on the analysis of learning needs through interview activities, it can be seen that it is necessary to develop lessons to provide meaningful learning process activities, not just learning mathematics by memorizing. Learning media is messages or information intermediary designed as well as possible so that students more easily understand the lesson. The types of learning media developed are expected to overcome problems in a lesson, namely audio media, visual media, and audio-visual media (video). Media selection is very important in increasing student learning interest. The media required is learning video media. Video media is media that presents audio and visual which contains learning messages containing concepts, principles, procedures, and knowledge application theory to assist in understanding learning material. The advantage of video media is can present messages concretely or realistically, overcoming the limitations of distance, space, and time. In addition, it also consists of text, images, and sounds that appear simultaneously to motivate students to learn. It is very good at achieving learning goals in skills, reducing learning boredom, increasing memory retention of the material being studied, and making it easy to use and distribute (Purwanti, 2015).

According to (Mayer, 2009), the criteria for video media are that the material presented is structured, and the delivery of the message must provide instructions and guidance for understanding the concept. Not only using narration but also animation related to narration, and animation and narration are presented simultaneously. In addition, reduce the use of additional words, images, and sounds unrelated to the material. Not only in the form of text, but words should also be presented in the form of channeled or audible sounds and structured with a series of narrated images that describe the learning steps. Video learning duration is 5-20 minutes to keep students focused on learning and minimize student boredom (Nurdin et al., 2019). According to (Ou et al., 2019), there are principles in learning video development, namely learning through video can give examples, providing learning activities while doing, providing adaptive feedback, there are reflection stages in learning, and there are multimedia such as text, images, and voice. Based on these opinions above, developing learning videos must pay attention to the criteria and principles in their development so that it fits the expected media needs and is suitable to be used. Designing learning videos must have learning activities that have meaning for students and be able to use the learning model stages as learning scenarios in a video. The chosen learning model should have steps to connect or associate the knowledge that has been learned. The learning model that can be used is the CORE (Connecting, Organizing, Reflecting, Extending) model.

According to Shoimin (2014), the CORE model is an innovative learning model implemented in the 2013 curriculum. According to (Curwen et al., 2010), the CORE model has four core constructivist components, namely Connecting, Organizing, Reflecting, and Extending. Connecting is connecting students' knowledge. Organizing is organizing new knowledge or ideas into meaningful concepts for students. Reflecting is giving students the opportunity to recall and re-understand new material to be studied to strengthen understanding. Extending is expanding and developing students' knowledge by using it to solve problems independently. The application of the CORE model in learning activities is very important because it can facilitate students in understanding concepts, relationships between concepts, interpreting relationships between concepts, and using them in everyday life (meaningful learning) (Siagian, 2016).

In addition to video media, applying the CORE model can be used as a math learning video scenario and provide meaningful learning activities for students. In

accordance with the needs of learning mathematics, especially in geometry material which requires learning activities of new information that will be learned through the information learned. From the results of research by (Sa'adah et al., 2017; Nugroho, 2019), the application of the CORE model as the basis for learning tools developed is effective for learning mathematics, especially in geometry material. There is a gap between the expected learning process, namely the process of understanding mathematical concepts meaningfully, and the process of learning mathematics that occurs in real terms and often provides rote learning activities. Thus, students need technology-based learning media that can provide a meaningful process of learning mathematics in learning on geometric material. This development aims to describe the process of developing a mathematics learning video based on the CORE model with spherical space material. It is also necessary to develop a product, namely learning media in the form of learning videos based on the CORE model, which will later be helpful for students in order to get more meaningful mathematical concept learning activities. Applying the CORE model as a learning video scenario is expected to fully and meaningfully explain the mathematical concepts contained in the spherical shape material with active and innovative learning activities.

## **Method**

The research design used a development research model, namely ADDIE. It consists of five systematic steps, namely analyze, design, development, implementation, and evaluation. Its application was easy to understand and implement in the product development process (Putra et al., 2014; Wisada et al., 2019). According to (Tegeh et al., 2014), the ADDIE model was chosen as a development because it has systematic steps to overcome problems in learning. This study did not use a population or sample, but test subjects. The subjects in this development study were content experts, instructional design experts, instructional media experts, and 3 grade VI students at SD No. 1 Kaba Kaba. Data collection methods used in this development study were questionnaires, observations, and unstructured interviews. The unstructured interview method can be used in the introduction. Its function was to determine teachers' needs and problems in implementing the learning process. The observation method can be used to observe student learning facilities at school. The questionnaire method was used when analyzing student needs, testing a product in which the trial subjects were content experts rather than learning, learning design experts, and learning media experts, as well as individual trials conducted for students. Data analysis method used a quantitative descriptive analysis method. Quantitative descriptive method is data processing by compiling numbers or percentages in order to get an overall conclusion. Meanwhile, quantitative descriptive analysis is useful for processing data that will later be obtained from a questionnaire in the form of a score.

## **Results and Discussions**

The design process for this video learning media uses the ADDIE development model, which consists of the stages of analysis, design, development, implementation, and evaluation. There are deficiencies in the development process, namely at the implementation stage. It cannot be carried out because the implementation process is part of the application of a development product that is very appropriate to use in the learning process so that people can find out the product's effectiveness. Since this research was conducted during a pandemic, teachers and students could not carry out the learning processes directly in the classroom. The following are the results of the development stages that have been carried out.

It started with the analysis stage, which carried out the process of analyzing the needs of teachers and students in learning, analyzing the material, and analyzing the student learning environment. Analysis of teacher needs in learning mathematics through interviews found difficulties experienced by teachers during the learning process when explaining mathematical concepts to students. Teachers only used books as a source of reference for student learning. As an alternative, teachers now use learning videos downloaded via YouTube. However, learning videos are often not suitable for the expectations of teachers to be able to explain mathematical concepts meaningfully to students. Learning mathematics becomes a learning process to memorize rather than understand concepts using the learning resources. By using an analysis of student learning, it can be found that it is very difficult for students to understand mathematics and that students easily forget the geometric formulas that they have studied before. Students prefer to learn by using learning videos rather than just through books. The material analysis results from discussions with the teacher determined that the spherical shape material as the learning video content because of all the existing spherical shapes, understanding the concept of spherical shape is quite difficult to explain. Looking at its shape, a spherical shape has only one curved side plane, so understanding the concept of sphere volume and surface area requires a complete concept explanation, also supported by experimental activities. Analysis of student learning facilities by the observation to be able to see student learning facilities in the classroom, namely schools already have LCD projectors, speakers, and teachers who are proficient in using laptops.

The next stage was the design stage, which included activities (a) Determining the hardware and software used so that the process of developing software and hardware used is appropriate and there are no problems later. (b) Make a video flowchart as a video plot. (c) Compiling scripts and video storyboards is the most important part of the learning video scenario. d) Develop a Learning Implementation Plan (ILP/RPP) as a reference for implementing lesson activities using video lessons. e) Preparation of an assessment instrument on a product with a questionnaire carried out by trial subjects, namely experts and students so that the feasibility of a video lesson is obtained, which will be developed later.

The product development stage began with producing videos to evaluate products that trial subjects have developed to determine the product feasibility level before being used in the learning process. The development stage started with the activities of (a) video recording or shooting, (b) material preparation on Microsoft PowerPoint 2013, (c) video dubbing, (d) merging sound with text and images in Microsoft PowerPoint 2013, using Bandicam for screen recording, so that text, images, and sound in Microsoft PowerPoint 2013 become a video in MP4 format, (e) the editing stage, namely the stage of assembling all video components into a complete video according to the previously designed storyboard, and video editing using Wondershare Filmora 9, (f) the video finishing stage, namely the video export process into MP4 format, but before that, setting the video quality and resolution. Using the best quality with a resolution of 1920: 1080. (g) video storage on Compact Discs (CD), (h) making CD covers to make it more attractive so users know the contents of the video, and designing covers using Microsoft Publisher, and (i) after the video has been produced, the next step was the implementation of product trials, namely learning content experts, learning design experts, learning media experts, and students through individual trials.

Last was the evaluation stage. The formative evaluation aimed to minimize errors that occur in the development process. In the analysis stage, there was also an evaluation that aimed to analyze the needs of teachers and students in the learning process. The design stage in the evaluation process was carried out to see the completeness of the video



lesson development. Meanwhile, the development stage of the evaluation process was useful for determining the product feasibility to be developed through a product trial process by trial subjects. Thus, the results obtained from the trial subjects were used to improve or refine the product to be developed. Therefore, the learning video was successfully developed by applying the ADDIE model stages, even though the implementation phase could not be carried out.

Product trials were carried out by trial subjects, namely learning content experts, learning design experts, learning media experts, and students through individual trials. The trial activity aimed to determine the product feasibility level that will be developed later. Furthermore, product trials can be assessed using a questionnaire instrument and individual trials using three students with high, medium, and low mathematics learning outcomes. The following are the results of product trials by trial subjects.

Table 1. Percentage of Scores on Learning Video Product Trial Results

No	Trial Subjects	Results	Qualification	Information
1.	Learning Content Experts	95.20%	Very Good	Very Feasible, no need to revise
2.	Learning Design Experts	90.55%	Good	Very Feasible, no need to revise
3.	Learning Media Experts	95.54%	Very Good	Very Feasible, no need to revise
4.	Individual Trials	90.35%	Good	Very Feasible, no need to revise

(Source: Research Data Results)

Therefore, it can be concluded that the learning video products developed are feasible to use in the learning process and no longer need revision. Because the research results have obtained very good qualifications, so the media developed is very feasible to use in the learning process (Tegeh and Kirna, 2010)

The learning videos get very good qualifications from the results of the trial subject assessment, so the video lesson is very feasible to use in the learning process. The development of learning videos is used for the learning process because the stages of product development use the ADDIE development model. It has five stages of development, namely analyze, design, development, implementation, and evaluation. However, the development in the implementation stage could not be carried out considering that during the pandemic, where doing direct learning activities in the classroom made it impossible to know the effectiveness of the learning videos being developed. The ADDIE model has systematic stages in its development, so the products developed are suitable for fixing problems that exist between teachers and students in the learning process. The analysis process is useful for knowing the needs of teachers and students in the learning process so that it is known that the appropriate media is developed to improve student learning problems. The ADDIE model provides an opportunity to evaluate during the development process or at every step of development. It certainly helps to minimize errors that occur in the final product that will be developed later. The application of the right model for developing learning media made the developed learning video very suitable for use in the learning process because they are in accordance with the needs of teachers and students.

The results of the product trial stage research by content experts in mathematics learning, where learning video materials were developed so as to get very good results. If viewed from the questionnaire for assessing learning content, there are eleven indicators that are assessed from three aspects of the assessment, namely curriculum, materials, and grammar. In the curriculum aspect, there are various indicators, namely (a) suitability of

material with basic competencies, (b) suitability of material with learning indicators, and (c) suitability of material with learning objectives. These three indicators obtained very good qualifications. It is getting very good results because basic competencies, indicators, and learning objectives are used in accordance with the material so that the learning activities process in learning videos can truly achieve learning goals. In the material aspect, the indicators assess (a) the correctness of the material, (b) the systematics of the material, (c) the scope of the material, (d) the importance of the material, (e) media support for the material, and (f) the difficulty level of the questions. Indicators on the overall material aspect obtained very good results because the learning videos developed contain material concepts so that students know about the shape of a sphere. There are experimental activities to support the truth of the material. There is a learning process activity that can stimulate students to construct ideas, such as through discovery and experimentation activities which will make learning about geometric shapes more meaningful. In addition, it also obtains good qualifications in the grammatical aspects.

The results of product trial studies conducted by learning design experts obtained results with very good qualifications. Based on the learning design assessment questionnaire, there are three aspects that are assessed, namely objectives, strategies, and evaluation. In the aspect of objectives, there are three indicators that are assessed, namely (a) the suitability of the formulation of learning objectives, (b) the suitability of learning objectives with basic competencies, and (c) the suitability of learning objectives with learning indicators. This indicator obtains very good results because the learning objectives are formulated in the audience, behavior, condition, and degree format. Learning objectives are based on the competencies and indicators that have been set. There are seven indicators that are assessed in the aspect of strategy, namely (a) usage instructions, (b) facilitating students' independent learning, and (c) providing motivation to learn. These three indicators in the aspect of strategy obtained good results. Furthermore, (d) delivery of material according to the CORE model, (e) the CORE model explains the concept of material in a meaningful way, (f) completeness of information, and (g) provides examples of real objects.

These four indicators in the strategic aspect obtained very good results. The last aspect is evaluation aspects. There are two indicators in the evaluation aspects, namely (a) instructions for working on the questions and (b) the compatibility of the questions with the indicators to obtain very good results. Comments expressed by learning design experts regarding using the CORE model as a learning design are fascinating and capable of providing meaningful learning activities. Through the CORE model stages, learning activities are expected to be able to develop students' skills to be active and build their knowledge in making learning more meaningful. Another comment is related to giving the motivation to learn by using accompaniment music which is useful for using sound transitions for accompanying music, namely fade in and fade out. When the narrator speaks, the volume of the accompaniment music slowly decreases (fade in). When the narrator finishes speaking, the volume of the accompaniment music increases again (fade out) (Prahasari, 2014). Arrangement of accompaniment music to increase student learning interest.

Furthermore, the results of product trials conducted by learning media experts obtained results with very good qualifications. There are two aspects that can be assessed, namely technical and display. The technical aspect assesses indicators (a) the ease of media usage and (b) the duration of the learning videos. These two indicators obtained very good qualifications. Videos are very basic and easy to use, where it only needs to press the play button to start the video and the pause button to stop the video. Using video can be played repeatedly to make it easier to understand the material. In the display

aspects, the indicators assessed are as follows: (a) the attractiveness of the opening video, (b) the text readability, (c) the text size, (d) the suitability of the background, (e) the clarity of the images, (f) the attractiveness of the colors, (g) the clarity of the narrator's voice, and (h) layout. These eight indicators obtained very good results according to the expert's assessment. While the indicators (i) type of fonts and (j) musical accompaniment obtained good qualifications. According to media experts' comments, the appropriate font for elementary school-age children is *Comic Sans MS*.

While the results of individual trials involving three students from student assessments of learning video products obtained very good qualification results. Students gave positive comments on the learning videos that were developed. There are important points in the learning video assessment questionnaire that will be given to students, namely (a) readability of text, (b) clarity of images, (c) ease of understanding material, and (d) ease of remembering formulas. The four indicators obtained results with very good qualifications. Videos that are equipped with pictures, text, and sound will make it easier for students to accept learning because students' absorption and memory can increase with visual and audio stimulation through the senses of sight and hearing. Students will easier to remember the formulas discussed in the learning videos indicating learning activities provide meaningful learning activities, not just learning by rote or memorizing. In meaningful learning activities, using good quality learning videos in terms of content/material, learning design, and learning media, besides having a positive impact on learning, are believed to be able to improve the quality and results of student learning.

Thus, it can be concluded that learning video media is very feasible and suitable to be used in the learning process. Learning videos through the application of the CORE model will make student learning activities more meaningful so that students do not only receive information through the process of learning to memorize in learning mathematics, but students can interpret the information obtained, which can be instilled for a long time in students' memories. The implications of the results of developing learning videos based on the CORE model can be developed with learning media in the form of teacher learning videos, which use technology-based learning media by utilizing existing facilities and infrastructure in schools in the mathematics learning process. The CORE model used as a learning scenario produces a meaningful learning process in understanding mathematical concepts. In addition, teachers can also use the CORE model as a learning step if they want to make learning videos on other materials or when implementing offline learning so that students get a more meaningful learning process.

## **Conclusions**

The CORE model-based mathematics learning videos that applied the ADDIE development research model could be passed through four development stages: analysis, design, development, and evaluation. Thus, it produced very feasible and suitable learning videos to use in learning process activities. In addition, students will find it easier to understand and are expected to like mathematics. Eligibility could be assessed by subject matter experts so that they will get very good qualifications. Learning design expert trials obtained very good qualifications. Meanwhile, the learning media expert trials obtained very good qualifications. In addition. individual trials on three students obtained very good qualifications. Therefore, it can be concluded that the CORE model-based mathematic learning videos were very feasible if used in the learning process.



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