



Analysis of Youtube-Based Learning Videos on Volume Building Materials

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Abstract. This study aimed to analyze the feasibility of YouTube-based learning videos on volumetric material developed by teachers of grade 3 at SDIT Muhammadiyah Alkutsar based on 4 aspects, namely content aspects, linguistic aspects, presentation aspects, and visual aspects. The approach used in this study was qualitative with a content analysis design. The technique used in this study was documentation. Data were analyzed by data reduction, data presentation, and conclusion. The results of this study were shown from the analysis of YouTube-based learning video content for volumetric volume materials with the title “Mathematics Stabilization Class 3”. The content aspect analysis obtained a percentage of 90% with a decent category, the presentation aspect got 95% with a suitable variety, the linguistic element got 75% with a reasonably proper type, and the graphic part got 75% with a fairly decent category. This study implied that YouTube-based learning videos for volumetric materials developed by SDIT Muhammadiyah Alkutsar teachers were categorized as suitable learning videos as learning media. This study revealed the feasibility of YouTube-based learning videos developed by SDIT Muhammadiyah Alkutsar teachers as learning media.

Keywords: Tutorial video · Youtube · Volume geometry

1 Introduction

Youtube is very supportive as an integrated learning resource in the learning system [1]. The popularity of Youtube increases with the increase in the number of users. Anyone can easily access Youtube, and the existence of Youtube is beneficial for teachers in conveying material through videos made and uploaded to Youtube. Using learning videos uploaded on Youtube can display image and sound representations so that teachers can get ideas or learning materials during online learning. Videos made as the delivery of teaching materials must be attractive to make students interested and excited to watch the video.

Mathematics lessons are learning that can be found at all school levels, one of which is elementary school. Mathematics is a science of numbers created from human thinking related to processes, ideas, and reasoning. Mathematics is also a series of methods for drawing conclusions and communicating ideas with ideas [2]. Mathematics lessons need media as a learning tool and creative learning designs, so students are interested in

learning the subject matter. Learning techniques rich in mathematical activities become the driving force of learning, while technology is the driving engine that accelerates, simplifies, and provides experiences without which learning becomes less meaningful [3]. Teachers must educate their students as well as possible so that teachers can improve their knowledge following the procedures of the field of study being taught. Good mathematics learning is expected so that students have critical, logical, creative, and systematic thinking skills and the ability to collaborate efficiently following the Indonesian 2013 Curriculum (2013). The learning material in the learning video made by the SDIT Muhammadiyah Akautsar teacher contains material on the volume of building spaces.

The volume of the building is a measure that states the quantity of the room occupied by the space itself [4]. Students have difficulty understanding concepts and applying formulas and calculations [5]. Problem learning volume of geometric figures is caused by students not being careful in reading, understanding, and answering questions. In addition, the lack of students' spatial abilities in imagining spatial structures [6]. Therefore, the selection of YouTube-based learning videos by SDIT Muhammadiyah Alkautsar teachers is not only a learning medium but also as a tool for delivering teaching materials, in this case, the volume of building materials.

All educational institutions, including elementary schools, must carry out online learning. This gives teachers creativity and innovation in teaching and learning during online learning so that the desired learning goals are still achieved. In addition to having creativity in the delivery of education, teachers are required to be able to use excellent and appropriate learning methods and learning media so that learning objectives can be achieved. Learning media has many types, and each has different effects. This gives the teacher as teacher the ability to choose and use learning media following the learning objectives and conditions in the teaching and learning process. In line with that, the SDIT Muhammadiyah Alkautsar teacher decided to learn media using Youtube-based videos to conduct online learning during the Covid-19 pandemic. The school's multimedia team assists the teacher in making learning videos, especially in this case, the subject of strengthening mathematics with volume-building material uploaded to the Youtube page with the title "Mathematics Stabilization Grade 3". Learning videos displayed for students must know the feasibility level, so analysis is needed. The study includes content, linguistics, presentation, and visual analysis. Learning videos can be feasible if they meet several criteria [7]. Each aspect has several indicators, both from the content, linguistic, presentation, and visual elements.

Several studies related to youtube-based learning videos on volume-building materials have been carried out. Novita et al. study's results explained that using innovative learning media can improve student learning outcomes [8]. Rillianing & Hapsari study the Youtube application makes it easy for students to solve problems from easy to complex, Youtube is effective as a medium for learning Indonesian, and Youtube can be used to help formulate material that is used as the basis for questions in specific contexts [9]. Arina et al. developed interactive multimedia to determine and describe the volume of building spaces in class V material [4]. Nuraeni et al. explained the results of cognitive understanding of mathematics from the material angle using learning videos [10]. Rahmawati study explained that each Mathematics learning video has advantages and disadvantages that distinguish between learning videos, the content in mathematics

learning videos is still not perfect; it still needs improvement [11]. Ghavifekr & Rosdy explained that using ICT is more effective than in traditional classrooms, and learning videos are more interesting for teachers and students [12]. Meyers study on youtube can create a space for students to find many references, present academic material, and provide comments about the quality, authority, and usefulness of content related to their information needs [13]. Insorio & Macandog explained that teacher-made learning videos through YouTube channels help students understand math lessons through comfortable and repeated viewing [14]. Seeing their teacher lecturing on video motivates students to consume and pay attention to the lecture. Yunita & Suprpto YouTube learning videos are categorized as feasible as media to support student learning with some notes; these notes show that learning videos circulating on YouTube still need improvement [15]. Ichiana et al. study explained that the mathematics learning video for class X IPA 2013 Curriculum Revised in the Ruangguru application is appropriate to be used as a learning medium for students [16].

The difference between this study and previous research is that this study analyzes YouTube-based learning videos made by homeroom teachers with the assistance of a unique team in editing at SDIT Muhammadiyah Alkautsar as a learning medium based on aspects of content, presentation, language, and graphics. Previous research discussed the analysis of youtube learning videos from various existing youtube channels, such as the Ruang Guru youtube channel. The reason the author chose YouTube-based mathematics learning videos at SDIT Alkautsar is that class teachers made this learning video with the help of a particular editing team owned by SDIT Muhammadiyah Alkautsar, in contrast to most elementary schools who choose to look for learning videos that already exist on YouTube rather than develop alone.

The study conducted by researchers was to reveal the feasibility of a Youtube-based learning video developed by a grade 3 teacher at SDIT Muhammadiyah Alkautsar as a medium for learning mathematics for volume-building materials based on aspects of content, presentation, language, and graphics.

2 Method

This study was qualitative with a content analysis design to analyze YouTube-based learning videos for subjects of mathematical stabilization on the subject of volumetric volumes descriptively. The description was based on the analysis of learning video content made by the SDIT Muhammadiyah Alkautsar teacher and uploaded to Youtube. The data were content analysis, linguistic analysis, presentation analysis, and visual analysis. The research instrument contains indicators that become a reference in the study. In the content analysis, 5 aspects were used, namely the suitability of the material with KD (basic competence) and arrows, the usefulness of the content with the level of development of students, the appropriateness of the needs of teaching materials, the moral and social values contained in the video, the truth of the substance of the material. Analysis of the presentation of indicators used was clarity of learning objectives, provision of stimulus, delivery of material straightforwardly and transparently, and completeness of learning information. Analysis of the indicator language used was the accuracy of vocabulary, sentence effectiveness, word standard, and the level of language convenience

for students. Furthermore, the indicator graphic analysis used was the suitability of the illustration with the material, attractive background design, image and illustration layout, and video quality [7].

The data from this study was in the form of a YouTube-based learning video for the mathematics stabilization of the volume-building material created by the SDIT Muhammadiyah Alkautsar teacher and uploaded on the Youtube page with the title "Massification of MTK Class 3". The object of this study was the content of the learning video. In this study, the authors analyzed the content of the learning video based on the content aspect, linguistic aspect, presentation aspect, and visual aspect.

The data collection in this study was compiled from the documentation results. Documentation in this study was carried out by observing and identifying YouTube-based learning videos developed by SDIT Muhammadiyah Alkautsar teachers with the title "Strengthening MTK Class 3". Examination of the validity of the data in this study used the truth of expert judgment techniques. Experts, in this case, were experts in this study, namely people who have expertise in assessing the feasibility of learning video instruments based on content, linguistic, presentation, and visual aspects.

The data analysis process in this study uses the model from Miles & Huberman, and there were three steps in this model. First, after data collection includes data reduction, proceed with data reduction, data presentation, and conclusion.

3 Result and Discussion

3.1 Result

The learning videos produced by SDIT Muhammadiyah Alkautsar were compiled by a special team in the editing and making process, while terms of content and video fillers were carried out by the class teacher, in this case the grade 3 teacher.

Furthermore, the learning video was uploaded to the Youtube page so that all students can access it easily, anywhere and anytime and it can be viewed repeatedly.

The learning video that became the data for this research was a YouTube-based learning video for the subject of Mathematics for the volume of space created by the homeroom teacher for 3rd grade together with the Multimedia team of SDIT Muhammadiyah Alkautsar with the title "Mathematics Stabilization for Grade 3". The following are the results of the analysis of YouTube-based learning videos on the subject of mathematical stabilization of the volume-building material in terms of content, linguistic, presentation, and visual aspects:

Analysis of Youtube-based learning videos with the title "Mathematics Stabilization Grade 3" in the content aspect are categorized as very feasible. The analysis results obtained a score of 18 with a percentage of 90% from 5 indicators (See Table 1).

Analysis of Youtube-based learning videos with the title "Mathematics Stabilization Grade 3" in the linguistic aspect are categorized as feasible. The analysis results obtained a score of 19 with a percentage of 95% from 5 indicators (See Table 2).

Analysis of Youtube-based learning videos with the title "Mathematics Stabilization Grade 3" are categorized as reasonably feasible. The analysis results obtained a score of 10 with a percentage of 75% from 4 indicators (See Table 3).

Table 1. Percentage of Eligibility Aspect content

Content Aspect			
No	Indicator	Information	Score
1	The material follows KD and indicators	The teacher's material in the content follows the essential requirements and indicators.	4
2	Learning video content according to the level of development of students	Video content according to the level of development of students because of the illustrations	4
3	Learning video content according to the needs of teaching materials	The content in the video follows the requirements of teaching materials because the video shows an illustration of how to calculate the volume of a building with concrete objects	4
4	Learning video content contains moral and social values (curiosity, creativity, and spiritual attitude)	Ethical and social values in video content do not appear, but spiritual perspectives appear, namely by saying basmallah before studying	2
5	The truth of the substance of the learning material	The meaning of the material in the content is appropriate because the teacher explains the volume of building materials	4
Amount			18
Percentage			90%
Category			Worthy

Analysis of Youtube-based learning videos with the title "Mathematics Stabilization Grade 3" are categorized as reasonably feasible. The study results obtained a score of 11 with a percentage of 75% from 4 indicators (See Table 4).

3.2 Discussion

Content Aspect Analysis

The results of the content aspect analysis obtained a percentage of 85%, categorized as feasible. The assessment results on the content aspect were obtained from the evaluation of 5 indicators, 4 indicators received the highest score, and 1 hand received the low score. The temporal assessment indicators follow KD and the learning indicators get a score of 4, which is very good. Table 6. The video contents contain appropriate material, namely the volume of the building space. The suitability of the material with KD and indicators is needed in learning videos; learning materials have an important place in the learning process because the material is exciting and following KD and indicators

Table 2. Percentage of the feasibility of the presentation aspect

Presentation Analysis			
No	Indicator	Information	Score
1	The learning objectives are clearly stated at the beginning of the video	The learning objectives are shown in the background of the video and explained at the beginning of the video	4
2	There is a stimulus for students	The teacher invites students to practice calculating the volume of space with concrete objects around them, for example, flour and bowls.	4
3	The material in the video content is delivered in a coherent manner	The material in the video is presented cohesively from easy to complex material	4
4	The material is presented straightforwardly and transparently and supports students' understanding.	The teacher explains the material by pronouncing straightforward and clear sentences but often pauses sentences for too long, so the teacher looks nervous.	3
5	Complete learning information delivered	Video content contains complete learning information from start to finish	4
Amount			19
Percentage			95%
Category			Worthy

will help students explore the material [16]. The hand of suitability of the learning video content with the development of students gets a score of 4. In the video, the teacher not only explains the material orally but also conveys the material manifested by using a bowl filled with flour; this is in accordance with the development of students. The use of concrete objects as a tool to help deliver material makes it easier for students to understand the material; besides that students are motivated to participate in practicing what has been exemplified by the teacher [17].

Video content indicators according to the needs of teaching materials get a value of 4. Teaching materials are all forms of learning materials in the form of videos, modules, and handouts that teachers use to assist in the learning process to facilitate students' understanding in understanding learning materials [18]. In line with that, the content of the learning video has met the suitability of the needs of teaching materials; in this case the learning video contains learning mathematics for volume building material; this is proven through Table 6. The indicator of the truth of the learning material's substance gets a value of 4. The video content contains the meaning of the material already appropriate and delivered coherently. Indicators of learning video content containing moral and

Table 3. Percentage of Eligibility Aspects of Language

Language Analyst			
No	Indicator	Information	Score
1	Vocabulary accuracy	The vocabulary in the video content is PUEBI (Indonesian Standardization) compliant	4
2	Sentence effectiveness		4
3	Word standard	The teacher has used familiar words, but there are notes that the teacher uses non-standard words, such as the pronunciation of the word "Nah."	2
4	The level of language convenience for students	Teachers use more formal language than informal language, and this is not following the character of students	2
Amount			12
Percentage			75%
Category			Decent enough

social values (curiosity, creativity, and spiritual attitudes) get a value of 2. In the video, ethical and social discounts do not appear; only spiritual perspectives are realized by inviting students to say basmallah before learning. The suitability of the material, the use of learning models, and mastery of the material by educators [8].

Presentation Aspect Analysis

The analysis results on the presentation aspect obtained a percentage of 95% with a decent category. The assessment was obtained from the results of the analysis of 5 indicators with 4 indicators getting the highest score and 1 hand getting a score of 3. Indicators of learning objectives were conveyed at the beginning of the video and included in the outstanding category with a value of 4 manifested in the background image using PowerPoint slides including the learning objectives and the teacher describing study objectives in detail. The indicator of providing stimulus to students is in the excellent category with a score of 3. This is realized by the teacher inviting students to observe objects around us, asking students to do their experiments at home according to what is exemplified... The indicators of the material delivered coherently into the very feasible category with a value of 4; in the learning video content the teacher describes the material in order from easy to challenging levels; besides that it does not come out of the discussion of the material. Material indicators are delivered straightforwardly and transparently and support the understanding of students in the very good category with a value of 3, this is realized through the explanations provided by the teacher not using parable words so that it does not cause two interpretations for students to support students' understanding, but in some cases the explanation is a little unclear because there is a pause during pronunciation.

Table 4. Percentage of **Feasibility** of Graphic Aspects

Graphic Analysis			
No	Indicator	Information	Score
1	The illustrations used to follow the material presented	The teacher uses examples in the form of drums and bottles as illustrations to calculate the shape of the space using concrete objects	4
2	The background design can attract the attention of students in listening to the material presented	The background is just an image using a Powerpoint slide	2
3	Images and illustrations are placed neatly and attractively	The placement of photos and pictures is not attractive	2
4	The quality learning video has good pixel quality	The learning video already uses good pixel quality, which is 720 pixels	4
Amount			12
Percentage			75%
Category			Decent enough

The information conveyed by the teacher in the learning video is delivered coherently, with the beginning of the core learning and the end.

Result of Linguistic Aspect Analysis

The analysis results on the linguistic aspect obtained a percentage of 75% with a reasonably decent category with indicators of vocabulary accuracy and sentence effectiveness getting the highest score. This is because the teacher explains the material with vocabulary in the learning video. According to PUEBI, foreign words are not used in the analyzed video. In addition, the use of sentences in the video text follows SPOK. This becomes important in learning videos as learning media. It can be seen from the language in the displayed text and the sentences used in the video, foreign vocabulary and terms are not used. In line with the opinion [7] the use of simple language and sentences according to the characteristics of students.

Meanwhile, the indicators of word standardization and the level of language convenience for students get low scores. This is because, the pronunciation of words by the teacher still uses non-standard words such as the word “Nah” at the end of the sentence. In addition, the teacher’s explanation in the video uses more formal language than informal language, so it is not following the character of students who prefer to use casual language such as everyday language. This is unfortunate considering that using non-standard words according to language rules can reduce the understanding of the message conveyed to students. This is in line with the results of studies carried out

[19], that the use of non-standard language and words is difficult to avoid, especially in pronunciation.

Graphic Aspect Analysis Results

The analysis results on the visual aspect obtained a percentage of 75% with a reasonably decent category with the illustration indicators used following the material displayed and the quality of the learning video having good quality getting the highest score. This is realized by the presence of images in the form of bottles, drums and boxes which are used as illustrations to explain the space's volume. The learning video has a maximum video quality of 720p on the Youtube application, resulting in a clear and precise video display. The higher the video resolution, the clearer the quality of the video; besides that the viewer can choose the quality of the video to watch [19].

Meanwhile, the background design indicator can attract the attention of students in listening to the material presented and the illustration images are placed attractively, obtaining a low score, namely with a score of 2. following the material. At the same time, in the video there are no innovations such as animated images so that they do not attract the attention of students. In addition, the layout of the image on the video is proportional but the composition of the text color with the background is not suitable so that the text on the environment is not clear.

Based on the results of this study, it can be concluded as follows. The analysis results were obtained on the content aspect with a percentage of 90% with a category of 5 indicators, 4 indicators with a value of 4, 1 indicator with a deal of 2. The presentation aspect obtained a percentage of 95% with a decent category from the total assessment of 5 needles. 4 needles with a value of 4 and 1 indicator with a deal of 3. The linguistic and presentation aspects obtained the same percentage, namely 75%, with a reasonably decent category. In the linguistic element, 2 indicators get a value of 4 and 2 get a value of 2. The same thing is also found in the aspect of the presentation, 2 hands get a value of 4, and 2 indicators to get a value of 2. So that the YouTube-based learning video for building volume material with the title "Consolidating MTK Class 3" is categorized as feasible as an online learning medium, in addition, the learning.

4 Conclusion

Video can also be used as a supporting tool for conventional learning in the classroom. The findings in this study can make it easier for teachers to develop and evaluate YouTube-based learning videos. In addition, teachers can increase the use of learning media that follow learning materials with more variety and attractiveness to help students improve learning motivation and learning outcomes.

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