The Use of Tutorial Video in Learning Energy Sources

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A R T I C L E I N F O

A B S T R A K

Minat siswa dalam mengikuti pembelajaran daring masih kurang sehingga penting adanya media pembelajaran untuk meningkatkan minat belajar siswa dalam pembelajaran daring. Tujuan penelitian ini yaitu untuk menghasilkan media pembelajaran audio-visual dengan menggunakan prinsip dynamic drawing pada tema 9 subtema 1 muatan IPA dengan topik energi dan sumber energi di kelas IV sekolah dasar yang valid. Penelitian ini merupakan penelitian pengembangan yang berpedoman pada prosedur model 4D. Subjek uji coba penelitian ini terdiri atas 1 orang ahli materi, 1 orang ahli desain, dan 1 orang ahli media, 3 siswa untuk uji coba perorangan, dan 9 siswa untuk uji coba kelompok kecil. Data yang dikumpulkan dalam penelitian ini, yakni data kualitatif dan data kuantitatif. Pengumpulan data dilakukan menggunakan metode kuesioner dengan penyebaran instrumen rating scale. Metode analisis data yang digunakan dalam penelitian ini yaitu dengan menentukan persentase dari masing-masing responden. Validitas video pembelajaran IPA ditentukan dari hasil uji ahli dan uji coba produk melalui uji ahli materi pembelajaran, uji ahli desain pembelajaran, ahli media pembelajaran, uji perorangan, dan uji kelompok kecil diperoleh persentase sebesar 93,6 % dengan kategori sangat baik. Jadi, berdasarkan hasil penelitian tersebut, dapat disimpulkan bahwa video pembelajaran dapat dinyatakan layak digunakan dalam pembelajaran IPA kelas IV sekolah dasar dan mampu menjelaskan materi yang bersifat kongkrit.

A B S T R A C T

Students' interest in participating in online learning was still low, so learning media is important to increase student interest in online learning. This study aimed to produce audio-visual learning media using the principle of dynamic drawing on 9 sub-theme one science content with the topic of energy and energy sources in grade IV elementary school was valid. This study was development research that was guided by the 4D model procedure. The subjects of this research trial consisted of one material expert, one design expert, and one media expert, three students for individual trials, and nine students for small group trials—the data collected in this study, namely qualitative data and quantitative data. Data were collected using a questionnaire method with the distribution of rating scale instruments. The data analysis method used in this research was to determine the percentage of each respondent. The validity of the science learning videos was determined from expert tests and product trials through learning material expert tests, learning design expert tests, teaching media experts, individual tests, and small group tests. The percentage was 93.6%, with a very good category. So the results showed that learning videos can be declared suitable for science learning for grade IV elementary schools and can explain concrete material.

1. INTRODUCTION

In the current condition, when the world is being affected by the COVID-19 pandemic, which has an impact on the world of education (Herliandry et al., 2020) so that the Indonesian government issued a letter requiring all activities, including education, to be carried out so that education was carried out by online learning (Pawicara & Conilie, 2020). In general, education is an active effort carried out consciously by a person to develop his potential (Ilham, 2019; Safitri & Zafi, 2020). By issuing a circular that requires the implementation of education to be carried out from their respective homes, learning must be carried out online. Online learning is learning that is carried out not face-to-face or face-to-face meetings but is carried out by utilizing technology and the help of the internet network (Chang et al., 2021; Handarini & Wulandari, 2020; Pratama & Mulyati, 2020). by online learning, it is hoped that it will still give the same impression as face-to-face learning to students (Fitriyani et al., 2020). The success of the implementation of online learning can be seen if online learning can achieve the same learning objectives as face-to-face learning (Damayanthi, 2020). Online learning requires students to prepare or organize their learning (Sadikin & Hamidah, 2020), so teachers need to design online learning that does not burden students. To make all learning, whether online learning runs effectively and not, cause students to be burdened, it is necessary to have learning media (Setiawan et al., 2021). In general, learning media are all forms of tools

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or objects that can assist in the implementation of learning (Sholihin et al., 2020; Yanto, 2019). By using learning, media will make the learning process effective (Suriyanti & Thoharudin, 2019).

But in reality, in carrying out online learning, many teachers still do not use learning media (Munirah, Alim Bahri, 2019; Syahputra & Maulida, 2019). The results of observations showing that teachers are still lacking in using learning media in the form of learning videos. Teachers still use the lecture method where only material is provided using sources from theme books to convey information in the online learning process. Even though schools already have facilities that can support using media, but because of limitations in the ability to develop a media so that the learning process is carried out conventionally. This impacts the learning outcomes of most students who are still below the Standard and lack interest in student learning (Syamsuddin & Lukman, 2019). One of them is on the content of science learning.

Based on this, it is necessary to have learning media that can increase students' interest in learning. Using learning media in the learning process in the classroom will increase students' interest in learning (Supriyono, 2018). In addition, using learning media in the learning process will create an innovative learning atmosphere (Lestari & Wirasty, 2019). Before determining the learning media to be used in learning, it is necessary to know the criteria for selecting a good media. The criteria for selecting a good media include conformity to the material, conformity to student characteristics, conformity to the learning environment, and the safety of using media (Batubara & Batubara, 2020). In addition, students should be taught using interesting, effective, and practical media (Septiani, 2019). One example of learning media that has interesting, effective, and practical properties is learning video media. Learning video media is one of the audio-visual media that can convey the concepts of learning materials that can be used to help students understand the subject matter (Hidayati et al., 2019). In general, video can be defined as a medium that combines visualization of material and audio material (Nurdin et al., 2019). Learning video is one of the audio and visual aids simultaneously that can display an object to convey a process, explain concepts, and teach targeted skills that can influence students' attitudes (Fiorella & Mayer, 2018). Learning videos can replace direct learning because making videos is done by recording directly from the learning process carried out (Chorianopoulos, 2018; Mayer et al., 2020).

Many studies have examined learning videos that can be concluded that the learning video media is valid and feasible to use in learning (Anugerah et al., 2020) and can increase students' interest in learning (Yuanta, 2020). In these studies, the learning videos developed are still limited to learning videos that show teachers or instructors who teach with the lecture method only. Based on this research, research will be conducted on developing learning videos with dynamic drawing principles developed in science learning for grade IV elementary schools. The principle of dynamic drawing is when a person or student is better off watching a video lecturein . The video shows the teacher drawing a graph/picture when explaining the material rather than referring to a graph/picture drawn. It is the same as seeing the teacher explain the material already contained the picture (Mayer et al., 2020). By looking at the teacher's hand, drawing can influence students' learning motivation (Darmawati, 2017). The principal advantage of dynamic drawing is that seeing the instructor's hands move when drawing graphics in the learning video can create a sense of self-reference. Students feel as if their hands are drawing, leading to more prominent learning. Based on what has been mentioned above, this development research aims to determine the validity of instructional video media with dynamic drawing principles developed in science learning for grade IV elementary schools. With the development of this learning video media, it is hoped that it will increase understanding of science content, especially on Energy Sources, so that learning is more meaningful.

2. METHOD

This study used a 4D model with four stages: Definition, Design, Development, and Dissemination (Tegeh et al., 2019). The selection of this model was based on the consideration that this model was developed systematically and based on the theoretical foundation and theoretical foundation of learning design. This model was arranged systematically with structured activity tips to solve learning problems related to learning media according to the characteristics of students. The trial of the learning video product in this study was carried out through three stages, namely the expert test stage, the individual trial stage, and the small group trial stage. The expert test phase involves a material expert, learning design expert, and learning media expert. This individual trial phase was carried out individually involving three students from grade IV SD Negeri 4 Pendem. In a small group trial using as many as nine fourth grade students grouped based on each student's ability with details, three students with high learning achievement, three students with moderate learning achievement, and three students with low achievement. The nine students were students who did not take the individual test.

Data collection in this development used recording documents in the form of questionnaires/questionnaires and interviews. The questionnaire or questionnaire method collects data by providing a list of statements or questions to respondents (Agung, 2014). Questionnaires were used to determine the assessment of material experts, design experts, and media experts regarding science learning videos. The interview method was conducted to find out responses, comments, and suggestions on developing science learning videos. The form of the instrument used in this study was validation sheets from material experts, design experts, media experts, and individual and small group test sheets. The grid of instruments used in this study is shown in Table 1, Table 2, Table 3, and Table 4.

Table 1. Blueprint Material Expert Instrument

No.	Aspect	Indicator
1	Material	a. Clarity of learning materials
		b. Suitability of learning videos with learning objectives
		c. The suitability of learning videos with learning materials
		d. The accuracy of the distribution and coherence of the material
2	Language	a. Language compatibility with Indonesian rules
		b. The sentences used are easy to understand and understand
		c. The communicative nature of the language used
		d. Language level with student's cognitive

(Cheppy, 2017)

Table 2. Blueprint Media Expert Instruments

No.	Aspect	Indicator
1	Visual	a. Image clarity
		b. Shooting suitability
		c. Image motion speed
		d. Lighting accuracy
2	Audio	a. Voice clarity
		b. The rhythm of sound
3	Typography	a. Text type selection
		b. Text size accuracy
4	Presentation	a. Have an attraction
		b. Time duration
		c. Clarity of the storyline

(Cheppy, 2017)

Table 3. Blueprint Instrument Design Expert

No.	Aspect	Indicator
1	Visual	a. Image clarity
		b. Shooting suitability
		c. Image motion speed
		d. Lighting accuracy
2	Audio	a. Voice clarity
		b. The rhythm of sound
3	Typography	a. Text type selection
		b. Text size accuracy
4	Presentation	a. Have an attraction
		b. Time duration
		c. Clarity of a storyline

(Cheppy, 2017)

Tabel 4 Blueprint Individual and Small Group Test

No.	Aspect	Indicator
1	Learning	Basic competencies
		Learning indicators
		Learning objectives
		Theory
		Language
2	Quality	Media display

No.	Aspect	Indicator
		Media can motivate learning.
3	Evaluation	The questions presented are by the material
		Instructions for working on questions are clear.
4	Accessibility	Easy to use media
		Instructions for using media are clear.

<div align="right">(Cheppy, 2017)</div>

This development research used qualitative and quantitative descriptive analysis methods. The qualitative descriptive analysis method is a way of analyzing data in the form of words or sentences about an object systematically in generating general conclusions (Agung, 2014). The quantitative descriptive analysis method analyzes data in the form of numbers and percentages of objects systematically to produce general conclusions. This analysis is used to know the general description of the distribution of data in the form of scores that have been obtained from the expert assessment sheets (Agung, 2014). The formula used to calculate each subject is the percentage formula (Tegeh & Kirana, 2010). To give meaning and make decisions, the provisions are used is shown in Table 5.

Table 5. level Achievement Coefficient by 5 Scale

Level achievement	(%)	Qualification	Information
90-100		Very good	No need to revise
75-89		Good	Slightly revised
65-79		Enough	Revised sufficiently
55-64		Less	Many things have been revised
1-54		Very less	Repeated product

<div align="right">(Tegeh & Kirana, 2010)</div>

3.   RESULT AND DISCUSSION

Result

The definition stage in this study was carried out with four steps of analysis, namely needs analysis, video analysis, student characteristics analysis, and curriculum analysis. In the needs analysis, it was found that students have learned to use media other than books. However, there are still teachers who use learning videos that are not accompanied by explanations that are not too clear so that the learning process cannot be achieved optimally. Video analysis was carried out to obtain information about good video quality. In the development of this video, several criteria were used: aspects of media quality, aspects of language use, and aspects of media display. In the analysis of student characteristics, it was found that elementary school students are in the concrete operational stage, so that during the learning process, they need concrete objects. Based on this theory, it can be said that learning media is very necessary for the learning process. Media makes it easy for students to better understand the material being studied to achieve learning objectives. The implementation of curriculum analysis was carried out by analyzing KI, KD, and indicators contained in teacher and student books used as a reference in developing learning video media.

The design stage was carried out by compiling media assessment instruments and developing learning media in the form of learning videos. The media assessment instrument produced at the design stage consisted of four instruments, namely a validation instrument for material experts consisting of 8 questions, a validation instrument for learning design experts consisting of 11 questions, a validation instrument for media experts consisting of 14 questions, validation instrument for individual test and small group test consisting of 13 questions. At this stage, the media was designed using dynamic drawing theory with the topic of energy and energy sources. This learning media was shown to fourth-grade elementary school students. The software used in making the media was Kinemaster, with a video duration of 10-15 minutes. The learning media had a resolution of 1080p, with a 16:9 ratio. There were two types of musical instruments used in the video, namely uplifting music and soft flowing music, so that the learning video media becomes interesting.Furthermore, the design of the media concept was made in the form of a storyboard. Storyboards were made to visually display learning media in the form of learning videos on the topic of energy and energy sources on theme nine sub-theme 1 class IV as basic. The following was the learning video media image design, which can be seen in Figure 1 as follows.
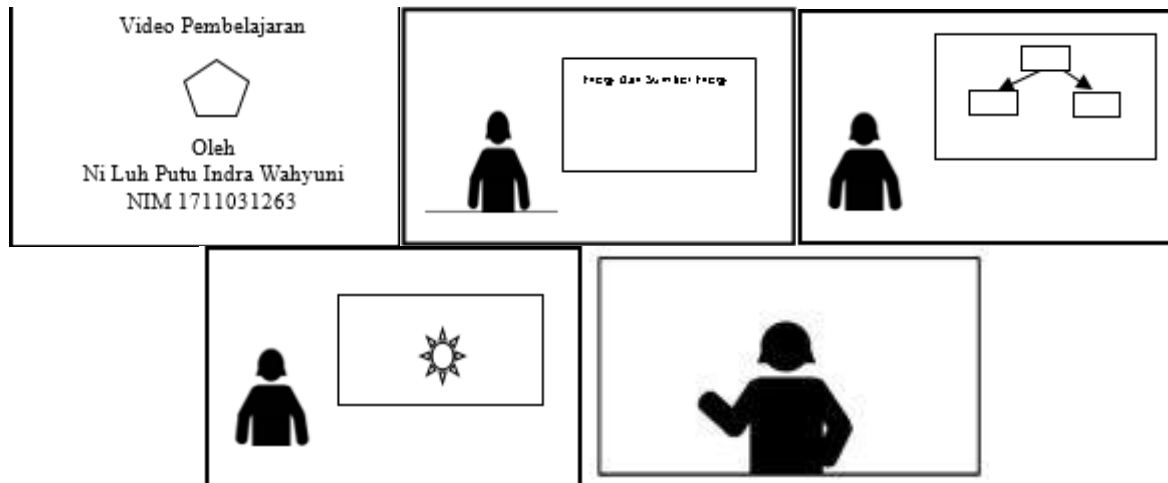
Figure 1. Learning Video Design

The development stage was the last in this research. At this stage, it is done by developing the actual product according to the script and storyboard that has been made. Furthermore, an assessment of the product was carried out by experts and practitioners to determine the validity of the developed media and get suggestions and comments so that improvements can be made to the media to become media suitable for use in the learning process. Based on the results of the assessment of the learning material expert test, a percentage of 93% was obtained with very good qualifications and did not need to be revised. The assessment results of the learning design expert test obtained 94% with very good qualifications and did not need to be revised. The assessment results of the learning media expert test obtained a percentage of 96% with very good qualifications and did not need to be revised. The assessment results of the individual trials obtained an overall percentage of 92% with very good qualifications and did not need to be revised. The results of the small group trial assessment obtained an overall percentage of 93% with very good qualifications and no need for revision. The results of the products developed in this study is shown in Figure 3.

Figure 1 the Beginning, Core, and Closing View of the Learning Video

Discussion

The product produced in this development research is a learning video media with the principle of dynamic drawing. Learning videos developed by following the stages of the 4D development model. The learning video was developed based on the needs analysis results, which required a video learning media containing an explanation in it. The development of learning videos is based on several criteria: aspects of media quality, aspects of language use, aspects of media display (Cheppy, 2017). In addition, the development of learning videos is adjusted to the KI, KD, and indicators contained in the teacher's book and student's book. Based on this, the development of learning videos will be used by the competencies to be achieved in learning (Fitriyah, 2021). Learning videos are developed by planning by making storyboards. A storyboard is a design in images that become a benchmark in making videos (Che Mat et al., 2017). Making a storyboard in the development of this learning video will make the learning video developed to be structured (Rossalyna, 2017).

Based on the assessment results of media experts, materials, learning designs, individual test students, and small group tests, the resulting product is declared valid. Based on this, the product can be said to be suitable for use in science learning for grade IV elementary school. Product feasibility Judging from the aspect of competence, the development of learning videos can be said to be suitable for use in science learning because it is by the characteristics of science learning wherein science learning there must be an active process, students do more, and the teacher facilitates (Hisbullah & Selvi, 2018). The use of learning videos can also explain the abstract material and by the characteristics of fourth-grade elementary school students. The use of learning media by the characteristics of students in learning can help students understand abstract material and improve student learning outcomes and achievements (Ekayani, 2017; Novita et al., 2019). This is in line with Piaget's theory, which states that elementary school children are in the concrete operational stage (AD, 2018; Bujuri, 2018), indicating that children will understand if taught with concrete or real objects. The learning video is declared feasible based on research that has been done previously. The use of learning videos can streamline the course of learning to improve student learning outcomes (Mutia et al., 2018; Ulyana et al., 2019). Based on the results of other studies, it can be stated that the development of learning videos can help teachers in delivering learning materials well so that they can improve learning outcomes and learning interests of elementary school students (Gazali & Nahdatain, 2019; Sulfemi, 2018). Based on what has been mentioned, it can be believed that the learning video can be declared valid and suitable for use in science learning for grade IV elementary schools and can explain concrete material.

Based on the results that have been obtained and seen from the feasibility of the learning video media that has been developed, the development of this learning video media has many advantages. The advantage of this development research is that the development of learning video media with the principle of dynamic drawing can make it easier for students to understand the topic of energy sources by seeing firsthand the use of energy sources in everyday life. This development can also grow and develop students' interest in learning in participating in learning. In addition, this research can make learning more effective because this learning video can be played back if there are parts of the material that students have not understood. This research implies that this research encourages teachers to be more creative in developing media by utilizing technological advances to create quality education. This can be seen from student learning outcomes and student learning motivation which decreases because learning is only centered on theme books. This research can also change the way of delivering material, especially in science subjects, theme nine sub-theme 1 with the topic of Energy and Energy Sources class IV to be more meaningful because it provides a clear understanding of concepts related to the topics presented. In addition, with this research, students can learn independently because these learning videos are easily accessible by students. The limitation of this research is that it is limited to the development of instructional video media, which is only made based on the topic of energy sources contained in the nine sub-themes theme one semester II grade IV Elementary School. Based on this, it is hoped that similar research can be developed with a wider scope of material.

4. CONCLUSION

Based on the results that have been obtained, it can be concluded that the learning video is declared valid based on the results of the assessment by learning media experts, learning design experts, learning materials experts, individual test students, and small group tests. Based on this, it can be believed that the learning video can be declared valid and suitable for use in science learning for grade IV elementary schools and can explain concrete material.

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