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Learning Heat Conductors and Insulators Using Video-Based Learning Media

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ABSTRAK

Pemaparan materi yang sedikit membuat pembelajaran menjadi kurang efektif, oleh karena itu diperlukan inovasi seperti video pembelajaran, agar pembelajaran menjadi menarik. Tujuan penelitian ini untuk menghasilkan media video pembelajaran berbasis demonstrasi pada topik konduktor dan isolator panas di kelas V yang sudah teruji validitasnya. Penelitian ini merupakan penelitian pengembangan (R&D). Penelitian ini menggunakan model 4D yang terdiri dari empat tahapan yaitu: *define*, *design*, *development*, dan *disseminate*. Subjek uji coba penelitian ini terdiri dari 2 ahli materi, 2 ahli media, dan 2 praktisi. Data penelitian dikumpulkan dengan metode kuesioner. Instrumen yang digunakan untuk mengukur validitas media adalah *rating scale* dengan skala 4. Data dianalisis menggunakan rumus mean untuk mengetahui rata-rata skor validitas media. Hasil validitas media dari segi ahli materi sebesar 3,92, dari segi ahli media sebesar 3,78, dan dari segi praktisi sebesar 3,78, dengan kualifikasi sangat baik. Jadi, media video pembelajaran berbasis demonstrasi yang dikembangkan dinyatakan valid. Media video pembelajaran berbasis demokrasi dapat dijadikan salah satu solusi dalam pelaksanaan pembelajaran inovatif dan menarik.

ABSTRACT

Less material exposure makes learning less effective, therefore innovations such as learning videos are needed, so that learning becomes interesting. The purpose of this study was to produce a demonstration-based learning video media on the topic of heat conductors and insulators in class V whose validity had been tested. This research is a development research (R&D). This study uses a 4D model consisting of four stages: define, design, development, and disseminate. The subjects of this research trial consisted of 2 material experts, 2 media experts, and 2 practitioners. The research data was collected by using a questionnaire method. The instrument used to measure the validity of the media is a rating scale with a scale of 4. The data were analyzed using the mean formula to determine the average media validity score. The results of the media validity in terms of material experts are 3.92, from media experts are 3.78, and in terms of practitioners are 3.78, with very good qualifications. So, the demonstration-based learning video media that was developed was declared valid. Democracy-based learning video media can be used as a solution in implementing innovative and interesting learning.

1. Introduction

Science content is one of the learning content that is taught at the primary school education level. The process of learning science content should prioritize the development of critical thinking skills and creativity of students in responding to natural phenomena that occur. Critical thinking and problem-solving skills are a foundation in preparing children for future challenges (Sung, 2017). This ability can be achieved if the learning process is full of innovation, meaning and fosters students' passion for learning. The science learning process should be carried out through scientific activities, including discussions, investigations, simulations, or project activities so that students can construct, understand, and apply the concepts that have been learned so that learning becomes more meaningful (Fauzan et al., 2017; Suryantari et al., 2019). The student-centered process of learning science with problem-solving orientation will increase student motivation (Huang, Kuo, & Chen, 2020). Learning science and technology can increase students' creativity, problem-solving skills, and interest in science (Perignat & Katz-Buonincontro, 2019). Another opinion explained that a good science learning process is to create an active and enjoyable learning atmosphere through the use of methods, models, approaches, and learning media that are in accordance with the material and characteristics of students (Sari et al., 2019;

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Widyaiswara et al., 2019). Learning media is a tool that functions to assist teachers in conveying information to students to receive messages clearly (Hadi, 2017; Nikmah & Pristiwati, 2019). The use of media in the learning process provides several benefits, including: the learning process becomes more varied, making it more interesting; learning media can increase student activeness in exploring knowledge; students become more enthusiastic in participating in learning; stimulate students to learn to be more focused and directed; has a positive impact on improving student learning outcomes (Jampel & Puspita, 2017; Lestari, 2018).

However, most of the science content learning process in the field has not been running optimally. The learning process, especially the science content, has several obstacles. Several problems in the science learning process: the ongoing learning process is still dominated by the teacher with the lecture method, the lack of enthusiasm of students in participating in learning, lack of discussion activities between students in building knowledge, use of learning media which is not yet optimal (Antari et al., 2019; Fitriani et al., 2021; Linda et al., 2021; Putra et al., 2019). The pandemic situation also affects the learning process, which from face-to-face directly becomes online learning. Research states that the implementation of online learning has so far been ineffective (Hong et al., 2021). Based on the results of a preliminary study that was carried out on 6 to 10 November 2020, through interviews with fifth-grade teachers in Gugus VIII, Kecamatan Buleleng, it was found that: especially during this pandemic, the learning process was mostly only carried out by providing material and assignments in student books; the number of complaints that teachers get from parents. The children have difficulty and lack of enthusiasm in understanding the material, which is only done by reading books; the scope of material presented in the student book can be said to be very little because most of the contents of the book are questions and worksheets that students can do. Based on the results of the distribution of questionnaires that have been carried out in Gugus VIII, Kecamatan Buleleng, it is also found that there are 87.5% of teachers who occasionally use technology in the form of video as a medium in helping the learning process. However, from 87.5% of teachers who used media in instructional videos, only 25% made it themselves. In comparison, 75% of other teachers only took videos from the YouTube platform, which were then sent to students. 75% of teachers who took videos from the YouTube platform, 50% of teachers stated that videos taken through the YouTube platform were less relevant to the material and characteristics of the students being taught. The videos obtained only explained the material text without being supported by concrete examples inside so that students still had difficulty understanding the concepts in the material presented. Suppose the above problems are not resolved immediately. In that case, it will certainly hurt the quality of graduates produced and lead to the low quality of Indonesian human resources in the future.

Therefore, efforts can be made to overcome this, by carrying out technology-based innovations, especially in science learning, given that technology utilized in the learning process will optimize learning outcomes (Chauhan, 2017; Tuma, 2021). One of the efforts that can be done is by developing instructional video media. Video is a set of components that can display sound and image simultaneously, showing a coherent arrangement of images and giving illusions, images, and fantasies to moving images (Limbong & Janner., 2020). Learning video media is a medium that aims to provide information in the form of learning material so that it is easily absorbed and can be played back without time limits so that the instructional video media is suitable to be used to overcome these problems. It is supported by several studies which state that learning assisted by instructional videos has a significant effect on student learning outcomes (Hadi, 2017; Kurniawan & Kuswandi, 2018; Pramana & Suarjana, 2018; Siswinarti, 2019; Dewi et al.,2019). In addition, the use of activity-based learning videos also has a positive effect on increasing student motivation (Sun & Gao, 2016). Based on this, instructional video media has a good impact on the learning process. The media is needed to help the learning process, especially learning that is carried out online. The use of videos in learning is the right choice because students are able to learn independently by watching these videos (Layona et al., 2017). However, from several videos produced in previous research, there are still weaknesses, the videos developed have not been supported by providing concrete examples that can support students' understanding in building the concept. Thus, a learning video media is needed that can cover these weaknesses, one of which is through demonstration-based learning videos. The learning video becomes more interesting if the content in the video is presented with demonstration activities as a concrete example given in supporting the facts of the concepts being learned. The use of demonstration activities is one of the advantages of the media in this study compared to other similar studies. The demonstration-based video media developed contains material explanations supported by demonstration activities in simple practicum on conductors and insulators. In addition, the demonstration-based learning videos developed also contain pictures that support the explanation of the material, accompanied by background music that can increase students' enthusiasm for learning, and background images that change so that they become more interesting. Through this media, students can learn independently and more easily understand a topic because the presentation of the material in the

video is equipped with practical activities that students can imitate. The demonstration-based instructional video media developed in this study have differences compared to the development of similar media. The difference lies in the topics taken, the conductors and insulators in the fifth grade of elementary school. This media has several advantages: the video contains demonstration activities in the form of practicum; the quality of images, sound, and text that are clearly displayed and also lightened by music which makes this media more interesting; the topics discussed have never been developed before; contains pictures that support the explanation of the material; accompanied by background music that can increase students' enthusiasm for learning; contains background images that change so that it becomes more interesting. This study aims to describe the design and development of and produce demonstration-based instructional video media on the topic of conductors and insulators in fifth-grade elementary schools whose validity has been tested. Thus, through the development of this media, it is also expected to provide space for students to learn independently and significantly impact improving student learning outcomes and motivation to improve the quality of graduates in the future.

2. Method

This research developed demonstration-based instructional video media on conductors and insulators in the fifth grade of elementary schools. The model used in this study is the 4D model (define, design, development, and disseminate), which was selected based on the consideration that the presentation of the model in the 4D learning model design is carried out (Tegeh et al., 2019). The procedures carried out by the researcher were: the define stage was carried out through four steps of analysis consisting of needs analysis, curriculum analysis, characteristic analysis, and subject analysis; the design stage was the design of demonstration-based instructional video media on the topic of conductors and insulators in fifth-grade elementary school is carried out. The design stage begins by determining the design of the instructional video. It started from the video's opening to the closing part of the video, made in a storyboard. The storyboard that has been created is then consulted with the supervisor to fix the deficiencies found; the development stage was carried out through the activity of making learning videos based on video designs that have been consulted with previous supervisors. Furthermore, after the video has been made, it continued by carrying out a product test to review the developed learning video. However, due to limited conditions and time, the product tests carried out were only limited to product tests carried out by experts and teachers as practitioners; the dissemination stage was carried out by distributing demonstration-based learning video media on the topic of conductors and insulators developed through the YouTube platform so that these videos can be accessed by teachers and students who need a wider scope.

The trial subjects in this study were two material experts, two media experts, and two practitioners. Trial subjects were selected based on the competence and expertise in their respective fields. The minimum criteria of expertise at the bachelor level. The types of data obtained in this study divided into two types, qualitative and quantitative data. Qualitative data was presented in the form of words, comments, and suggestions obtained from the review of experts, material experts in science content, media experts, and practitioners. Meanwhile, quantitative data was from numbers/scores obtained from media assessment sheets filled in by experts and practitioners. The data collection method used in the research on demonstration-based learning video media development was a questionnaire method. The data collected were comments and suggestions and the validation results of the developed instructional video media. The data collection instrument used in this study was a rating scale. The scale used on the rating scale is 1-4 (Ilhami & Rimantho, 2017). The product developed in this study is a demonstration-based learning video media. The assessment of the feasibility of this media refers to the validity aspects of the instructional video media, which include aspects of learning, material, media quality, language use, and media appearance. The learning video validation sheet can be seen in Table 1, Table 2, and Table 3. After the data was collected, the data analysis was carried out using quantitative descriptive analysis techniques and qualitative descriptive analysis. Qualitative data analysis was carried out by collecting and analyzing data in the form of suggestions and comments given by experts and practitioners. Meanwhile, quantitative data analysis was carried out by analyzing the data obtained at the expert review stage in the form of scores on the assessment sheet, converted to the conversion table for the level of achievement of scale 5 to determine the validity product being developed

Table 1. Material Expert Test Instruments

No	Aspect	Indicator	Number	Total
1	Learning	Learning objectives	1,2,3	3
		Delivery of material	4,5,6,7	4
		Motivating quality	8,9,10,11	4
2	Material	Material relevance	12,13,14	3
		Material selection	15,16,17,18	4
Total				**18**

Source: modified from (Andriawan, 2015)

Table 2. Media Expert Test Instruments

No	Aspect	Indicator	Number	Total
1	Media quality	Video quality displayed	1,2,3,4	4
		Ease of use	5,6	2
2	Use of language	Voice and text clarity	7,8,9,10	4
		The quality of language use	11,12,13	3
		The suitability of sentence placement	14,15	2
3	Media display	Video presentation	16,17	2
		Layout	18,19,20	3
Total				**20**

Source: modified from (Andriawan, 2015)

Table 3. Practitioner Test Instruments

No	Aspect	Indicator	Number	Total
1	Learning and materials	Learning objectives	1,2,3	3
		Delivery of material	4,5,6,7	4
2	Material	Motivating quality	8,9,10,11	4
		Material relevance	12,13,14	3
		Material selection	15,16,17,18	4
3	Media quality	Video quality displayed	19,20,21,22	4
		Ease of user	23,24	2
4	Use of language	Voice and text clarity	25,26,27,28	4
		The quality of language use	29,30,31	3
		The suitability of sentence placement	32,33	2
5	Media display	Video presentation	34,35	2
		Layout	36,37,38	3
Total				**38**

Source: modified from (Andriawan, 2015)

3. Result and Discussion

Results of The Definition Stage

The defining stage has been carried out in four stages: needs analysis, characteristics analysis, curriculum analysis, and media analysis. The results of the analysis obtained through the four stages as follows. The needs analysis was carried out through a preliminary study in observation, interviews, and distributing questionnaires to fifth-grade elementary school teachers in Gugus VIII, Kecamatan Buleleng, to determine the needs and problems experienced in implementing the learning process in the fifth grade of elementary schools. From the needs analysis that has been carried out, the results showed that fifth-grade elementary school teachers in Gugus VIII, Kecamatan Buleleng need instructional video media that can help teachers in transferring information to students during online learning. The characteristic analysis stage was carried out by analyzing fifth-grade students' characteristics regarding their level of cognitive development. From the characteristic analysis stage that has been carried out, it was found that fifth-grade students are classified into the concrete operational period.

The curriculum analysis stage was carried out by analyzing teacher books and student books on Science Theme 6 in fifth-grade elementary schools to obtain core competencies, basic competencies, competency achievement indicators, and learning objectives used as references in media development.

After knowing the basic competencies, proceed with compiling indicators of competency achievement and learning objectives to be achieved. The core competencies were obtained based on the analysis that has been carried out, understanding factual, conceptual, procedural, and metacognitive knowledge at the basic level by observing, questioning, and trying based on curiosity about himself, God's creatures, and their activities, as well as objects. Objects found at home, at school, and in games. Based on these core competencies, basic competencies were obtained in theme 6, applying the concept of heat transfer in everyday life. Furthermore, the basic competencies obtained from the teacher's book are (1) determining objects that are conductors and insulators, (2) conducting experiments on conductors and insulators, and (3) concluding experimental activities on conductors and insulators.

The media analysis stage was carried out to collect information about the criteria for good learning media to be used as a reference. Based on the media analysis carried out, the results show that a media can be said to be good if it has met several requirements: (1) effective (providing high yields), (2) efficient (easy use, can cover a wide range of contents, but not requires a lot of time and place), and (3) communicative (messages conveyed following learning objectives and easy to understand). Apart from these requirements, good media must also fulfil several aspects of validity. The validity aspects of instructional video media include aspects of learning, material, media quality, language use, and media display. The learning aspect consists of learning objectives, delivery of material, and quality of motivation. The material aspect consists of the relevance of the material and the selection of the material. Aspects of media quality consist of the quality of the video displayed, ease of use, clarity of voice, and text. The aspect of language use consists of the quality of language use and the suitability of sentence placement.

Results of The Design Stage

The design stage of demonstration-based instructional video media on conductors and insulators in fifth-grade elementary schools produces an assessment instrument that will assess the feasibility of the media and produce media development designs. The media assessment instrument used is a rating scale of four divided into three instruments, the material expert validation instrument, the media expert validation instrument, and the practitioner validation instrument. The resulting material expert validation instrument consists of 18 statement items divided into two aspects and five indicators. The resulting media expert validation instrument consists of 20 statement items divided into three aspects and seven indicators. Meanwhile, the practitioner validation instrument consists of 38 statement items divided into 5 aspects and 12 indicators. The resulting media assessment instrument has been tested for validity and reliability by analyzing the judges' test results. The media designed is a demonstration-based learning video media. The instructional video made contains material about conductors and insulators in the fifth grade of elementary school. The content/content in the instructional video is also integrated with demonstration activities in a simple practicum that students can imitate. The design/media concept is then presented in the form of a storyboard. The learning video storyboard created is a demonstration-based instructional video media scenario design on conductors and insulators in the fifth grade of elementary school. The storyboard that has been made consists of a video section, video content, a sketch of each scene, and information that supports the video design made. The storyboard view can be seen in Figure 1 and Figure 2.

Figure 1. Display The Storyboard of The Problem Section

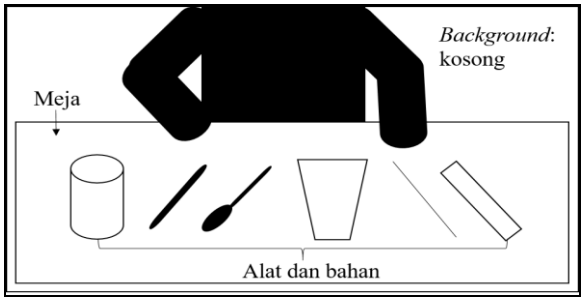

Figure 2. Display The Storyboard Part of Giving Demonstration Activities

Results of The Development Stage

The development stage begins with creating the initial product based on the storyboard that has been made. Furthermore, the initial products produced tested by experts and practitioners to obtain assessment results to determine the validity of the media and suggestions and comments as guidelines for

improving the products made. Some of the comments and suggestions were given: (1) the use of the word "compiler" in the video at 6:31 minutes is not quite right, (2) at the end of the video add a short work colleague and thank you, (3) writing on the text balloon should not write in italics, (4) the opening text should not be full on the screen, increase the distance to the screen border. Data analysis was carried out by calculating the average score obtained from the expert and practitioner assessment sheets. The data is then converted into five scale conversion guidelines to determine the demonstration-based instructional video media validity. The validity score and the criteria of the product validity in terms of experts and practitioners can be seen in Table 4, Table 5, and Table 6.

Table 4. Analysis of The Product Validity Scores in Terms of Material Experts

No	Aspect	Indicator	Average	Criteria
1	Learning	Learning objectives	3,8	Very good
		Delivery of material	4,0	Very good
		Motivating quality	4,0	Very good
2	Material	Material relevance	4,0	Very good
		Material selection	3,8	Very good
Average			**3,92**	**Very good**

Table 5. Analysis of The Product Validity Scores in Terms of Media Experts

No	Aspect	Indicator	Average	Criteria
1	Media quality	The quality of the displayed video	3,8	Very good
		Ease of use	4,0	Very good
		Clarity of sound and text	3,6	Very good
2	Use of Language	The quality of language use	4,0	Very good
		The suitability of sentence placement	3,8	Very good
3	Media display	Video presentation	3,8	Very good
		Layout	3,5	Very good
Average			3,78	**Very good**

Table 6. Analysis of The Product Validity Scores from Practitioner's Point of View

No	Aspect	Indicator	Average	Criteria
1	Learning and materials	Learning objectives	3,8	Very good
		Delivery of material	3,8	Very good
		Motivating quality	3,8	Very good
2	Material	The relevance of the material	3,7	Very good
		Selection of materials	3,9	Very good
3	Media quality	The quality of the displayed video	4,0	Very good
		Ease of use	3,8	Very good
		Clarity of voice and text	3,8	Very good
4	Language	The quality of language use	3,7	Very good
		The suitability of sentence placement	3,5	Very good
5	Media display	Video presentation	3,8	Very good
		Layout	3,8	Very good
Average			**3,78**	**Very good**

Based on the data in Table 4, it was known that the mean score of validity in terms of material experts scored 3.92 with very good validity criteria. Then, based on the data in Table 5, it was found that the average validity score in terms of media experts scored 3.78 with very good validity criteria. Meanwhile, based on the data in Table 6, it was found that the average validity score in terms of practitioners scored 3.78 with very good validity criteria according to the five scale conversion guidelines. It showed that the demonstration-based instructional video media on conductors and insulators in fifth-grade elementary schools are declared valid. The final product is obtained from the media, ready to be distributed from the validity and product improvements. The final product display of the developed instructional video media can be seen in Figure 3 and Figure 4.

Figure 3. Final Display of The Problem Assignment Section

Figure 4. Final Display of The Demonstration Activity Section

The Result of the Dissemination Stage

This stage was carried out by uploading demonstration-based learning video media on the YouTube platform. Based on the dissemination carried out, it was found that the media developed had been accepted and could be witnessed by the general public. The audience's enthusiasm can be seen, which has reached 330 views with 112 viewers who liked the video. It was also supported by the positive comments from the audience in benefits, the material presentation, sound, and images. Comments given by viewers on YouTube can be seen in Table 7.

Table 7. Viewer Comments on YouTube

No	Aspect	Comments
1	Image / video display	The images/videos that are displayed as a whole are good, structured, and clear.
2	Delivery of material	The delivery of the material has been done well, is coherent, clear, and is supported by examples that exist in everyday life. The material presented is easier to understand.
3	The attractiveness of the video	The videos made are very interesting and inspiring.
4	Benefits	The learning videos made are very useful in helping students learn, especially in online learning during the Covid-19 pandemic.
5	Audio / sound	Audio and sound effects are used following the presentation of the material

Discussion

The demonstration-based learning video media produced in this study were learning media tested for their validity, so they were suitable for the learning process. The findings were generated because demonstration-based instructional video media on conductors and insulators developed had gone through a series of development stages following the development model procedure used and had passed the validity testing phase, product improvement to product distribution. The defining stage that has been carried out showed that fifth-grade elementary school teachers in Gugus VIII, Kecamatan Buleleng, need learning media in instructional videos following student characteristics to help teachers transfer information to students online. Student characteristics are important to consider in determining the learning media to be used (Abidin, 2017; Kurniawan, 2017).

The characteristics of fifth-grade elementary school students are stated to be at the concrete operational stage so that the media produced must adapt to the characteristics of students at that level so that the learning media used can motivate and help students in building their concepts independently (Fajri, 2017; Istiqlal, 2017). The characteristics of students at this level tend to like learning media that can arouse their curiosity, as well as be able to attract their attention. Primary school student attention or attention can be drawn using instructional media to move the various senses in sight and hearing. Following previous research, which states that media that can attract the attention of elementary school students is media that has an attractive appearance, is full of colour, and is supported by audio that can arouse students' enthusiasm (Sholihah & Mintohari, 2020; Yuanta, 2020). So, we need a learning media that can attract students' attention and enthusiasm in learning. In addition to paying attention to these aspects, learning media must also pay attention to the purpose of making these media. Learning media is made so that the learning process is carried out more effectively in achieving learning objectives. In making learning media, it is necessary to carry out the curriculum analysis stage to obtain learning objectives following the competencies and learning indicators (Rasyid et al., 2017). Learning objectives

are used as benchmarks for implementing the learning process so that learning objectives must be well structured according to basic competencies and indicators of competency achievement (Suparni, 2020). The conditions for good media to be developed in elementary schools include material/content aspects and media display aspects of the media that are effective, efficient, and communicative following student characteristics following Piaget's basic cognitive theory, which states that cognitive processes involve the brain. In obtaining information, storing information in the form of a life scheme, so that in achieving it, it is used the carrying capacity of props or media that can attract students' learning interest and motivation as a factor that plays an important role in the learning process (Mitasari, 2018). Therefore, demonstration-based instructional video media development on conductors and insulators in fifth-grade elementary school was carried out.

The development of a good learning media must go through a series of design stages first. The design stage was important to do to get an initial picture of the media to be made. All aspects must be considered in making the media design, both in appearance and the material presented. Given the learning media made in videos, a storyboard was made as an image design presented on the learning video. It was important to make a storyboard so that the media produced it as expected. Each scene will be determined in detail in the storyboard, starting from the narrative spoken by the talent, the background images used, to the music that accompanies the learning video (Kunto et al., 2021). After all these things were fulfilled, then the media design is developed. The design of instructional video media must pay attention to several things: the image displayed, the colours used, and the supporting audio used. The images displayed on the learning videos must be of good quality so that the images presented can be seen to be easy to observe. Following previous research, the quality of image clarity is one of the important elements in a learning video (Sholihah & Mintohari, 2020). Likewise, the selection of colours used in the instructional videos was also important to note. Each colour had a different meaning and had a good effect on the psychologist who observes it. Such as the colour chosen as the video background shown, there were various kinds of colours that alternate, including 1) the purple colour used can attract attention, strengthen intuition, imagination, and creativity, 2) the orange colour used symbolizes excitement to build the spirit of the viewer, 3) the blue colour symbolizes calmness so that the audience will feel comfortable when watching the video that is broadcast, and 4) the green colour symbolizes coolness that can balance the emotions of the audience, following previous research which stated that the use of colours in learning media has an unconscious influence on a person's psychology (Karismaet al, 2020; Sentarik & Kusmariyatni, 2020). In addition, the audio aspect was also very important in supporting the media design created. It was because audible audio will reinforce the material presented to be listened to and absorbed properly. The audio used must be clear, and the music used to accompany the presentation of the material must be interesting but must not cover/interfere with the audio spoken by the talent so that the material explained can still be heard clearly (Firdaus & Mintohari, 2020). If all of these aspects have been fulfilled, then the media created was expected to attract and increase student motivation to achieve good learning outcomes. The instructional video media that have been made must be tested first to determine the feasibility of the media from experts the point of view who master the field of media being made.

The results of the assessment given by the two material experts showed that the media developed was valid with an average score of 3.92 and classified into very good criteria. These criteria were obtained because the learning aspects and material presented in the developed instructional video media were clear and could attract students' interest. The objectives presented in the learning video followed basic competencies. In addition, the material presented has been conveyed clearly, attractively, and following the learning objectives and characteristics of students. There was also a demonstration activity in the learning video in a simple practicum that students can follow. Through demonstration activities carried out, it can increase the attractiveness and enthusiasm of students in carrying out the learning process. The implementation of demonstration activities in science learning increases the average score of student evaluation results. It can be said that the demonstration method can improve students' understanding of science learning on the material properties of light in fifth grade. In line with this, other research also showed that implementing demonstration activities in learning can also improve the process and improve student learning outcomes (Helminaria, 2018). Based on the assessment given by the two media experts, it was found that the media developed was valid with an average score of 3.78 and was classified as very good. These criteria were obtained because the media quality, use of language, and appearance of the media have been fulfilled properly. The clarity of the voice and text on the developed video media was presented to become more attractive. In addition, the quality and appearance of the video media being developed followed the requirements of good media, effective, efficient, and communicative (Hidayati, 2019). Based on the media and material experts test, the learning video media developed were feasible and effective to support the learning process.

In addition, based on the assessment given by the two practitioners, it was found that the media developed was valid with an average score of 3.78 and was classified as very good. These criteria were obtained because the learning aspects and material presented in the developed instructional video media were clear and could attract students' interest. In addition, the criteria for aspects of media quality, use of language, and appearance of media in the developed media have also been fulfilled properly. The findings of this study are in line with research which showed that the results of expert reviews, individual test results, and group test results show that the developed learning video media is valid and improve learning outcomes of Hinduism (Tegeh et al., 2019). In addition, other studies also stated that based on the results of material expert reviews, media expert reviews, individual test results, small group trial results, large group test results, and post-test results showed that the media developed was valid and effectively used in the learning process (Kurniawan & Kuswandi, 2018). In line with the assessment by experts and practitioners, the results of the dissemination stage also stated that the media could be accepted by the public as seen from the enthusiasm of the audience who listened to the learning videos in providing comments and input on the media made.

The findings of this research as a whole, it is believed that the use of demonstration-based instructional video media on the topic of conductors and insulators in fifth-grade elementary schools is feasible and can be used in the learning process to achieve maximum learning objectives. Teachers and students are very difficult to carry out experiments conducted at home because of the lack of guidance from teachers. Books only guide students to conduct experiments. Therefore, with this learning video, students can be led to do simple experiments that can be done in their respective homes so that students do not get bored in learning. Most of the fifth-grade material, especially in science, requires students to do simple experiments. In addition, this video media can also be played back and makes it very easy for students to carry out experiments carefully. The suitability of the material with this media is suitable for use in learning which is usually in explaining the topic material of conductors and insulators, which tends to indicate which objects are included as conductors and insulators directly. Therefore, this video media can improve students' understanding of the topic of conductors and insulators. In addition, this video has complete examples of insulators and conductors. So, with demonstration-based videos, students can learn better and better understand the material than just reading books because demonstration-based videos can provide an overview of the material being studied using attractive displays, clear voices, and real examples. In addition, students can also learn repeatedly, unlike in the classroom where the teacher only delivers the material once. Teachers in the learning process could use video media to convey material to increase student interest in learning, stimulate thoughts, and stimulate thoughts feelings to gain knowledge (Sulfemi & Mayasari, 2019).

4. Conclusion

Demonstration-based instructional video media on the topic of conductors and insulators in fifth-grade elementary schools can be suitable for assisting learning activities with very good criteria in terms of material, media, and practitioners. Some suggestions can be conveyed in this development research. The use of demonstration-based learning video media showed that students could carry out simple demonstration practicum activities. In addition, this media was expected to assist teachers in transferring the material discussed. Meanwhile, it hoped that this research could continue until the stage of effectiveness testing or carry out similar research on different materials for other researchers.

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