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DEVELOPING VIDEO OF SET MATERIALS USING BANDICAM AS LEARNING MEDIA AMID PANDEMIC

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Abstrak

Siswa mengalami kesulitan dalam memahami konsep matematika karena media pembelajaran yang sulit dipahami. Perlu adanya media pembelajaran yang menarik, lengkap, dan mendukung pembelajaran online. Software Bandicam menawarkan kesempatan bagi guru untuk membuat video pembelajaran menarik yang mendukung pembelajaran online. Berdasarkan tujuan tersebut digunakan Research and Development (R&D) dengan pengembangan 4-D. Sampelnya adalah siswa kelas VII SMP Muhammadiyah Ambarawa yang mempelajari materi himpunan. Hasil penelitian menunjukkan bahwa video pembelajaran dengan menggunakan software Bandicam dinyatakan layak sebagai media pembelajaran online. Hasil penilaian ahli didapatkan rata-rata skor dari ahli materi himpunan sebesar 82,33%, dan dari ahli media sebesar 85,09%. Hasil uji coba menyatakan bahwa rata-rata siswa yang menggunakan video pembelajaran adalah 82,61%. Berdasarkan penilaian ahli dan siswa, dapat disimpulkan bahwa video pembelajaran menggunakan software Bandicam cocok sebagai media pembelajaran online

Kata kunci: Bandicam, materi himpunan, video pengajaran.

Abstract

Students have difficulty in understanding Mathematical concepts because the instructional media are difficult to understand. It is necessary to have instructional media that is attractive, comprehensive and supports online learning. Bandicam software offers a chance for teachers to create an interesting instructional video that supports online learning. Based on the aim, Research and Development (R&D) with a 4-D development is used. The sample was the seventh grade of SMP Muhammadiyah Ambarawa that learned about Set Material. The results showed that instructional video using Bandicam software was identified as feasible as an online instructional media. The results of the expert's assessment found that the average score from the set material expert was 82.33%, and from the media, the expert was 85.09%. The results of the trial stated that the students' average using the instructional video was 82.61%. Based on the expert and student's assessment, it can be concluded that instructional video using Bandicam software is suitable as an online instructional media.

***Keywords**: Bandicam, instructional video, set materials.*

INTRODUCTION

Teaching and learning mathematics that is carried online creates obstacles faced by students, such as the availability of minimal learning resources and less support for learning (Annur & Hermansyah, 2020; Fauzy & Nurfauziah, 2021; Utami & Cahyono, 2020). Students are only facilitated with student activity sheets (LKS) as the only

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learning resource that can be used for independent study at home. Current conditions also require teachers to be creative and innovative in making learning media that students can use to study independently at home. Based on this, it is important to develop e-learning media as a solution to the problems of teachers and students in carrying out the learning process (Hutauruk & Sidabutar, 2020; Rinrin Nur Tasdik & 1, 2021; Utami & Cahyono, 2020). This limitation, coupled with the uneven distribution of provider signals, is a real obstacle to be faced (Kharisma Danang Yuangga, 2020; Suriadi et al., 2021; Widodo & Nursaptini, 2020). In addition, not all teachers understand using online platforms that can support online learning activities (Hafiz et al., 2020; Prawanti & Sumarni, 2020). This has resulted in the minimal use of software such as applications to manage classes and learning support media like e-books, PPT, instructional videos.

Several studies about research and development of Mathematics instructional videos are research conducted by (Suantiani & Wiarta, 2022) entitled the development of interactive videos containing authentic problems to increase interest and achievement in learning mathematics for junior high school students. The research resulted in instructional videos that could increase interest by 2.97 and the average student achievement of 78.88. Research on the development of instructional videos was also carried out by (Wulandari, 2020) with the title of developing an authentic problem-oriented interactive video lecture to improve understanding of social arithmetic concepts in seventh-grade junior high schools. The results of the study stated that the instructional video was efficient to use in learning. Research on the development of instructional videos on the same material was also carried out by (Andriani & Sunismi, 2019) with the title of developing realistic-based interactive mathematics instructional videos on arithmetic material for class VII SMP. The results of the research stated that 100% of teachers and 70% of students agreed with the use of the instructional video. These studies provide information that instructional videos are one of the alternative media that have a positive impact on the achievement of learning objectives. Therefore, the research about developing mathematics instructional videos on set material using Bandicam has not been conducted before, so in this research, those variables become the main concern.

In the set material, a lot of new mathematical symbols are used and not explained how to read and use them. For example, in the set material there is a discussion stating the set with set-forming notation, which is part of the material from the set that uses a lot of symbols and symbols so it requires verbal explanations to make it easier for students to understand the concept. In the set material there is also a procedure for preparing a Venn diagram. This section requires direct practice that can be seen and heard by students so that the concept of the Venn diagram is easy to understand and can be used to solve problems. Bandicam application is one of the screen recorder applications that enables teachers to create creative learning material in the form of instructional video. The instructional video created using Bandicam will convey Set material that is easy to share and download on any online platform. It can be played and learned repeatedly

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independently by students. In brief, the instructional video of set materials using Bandicam should be developed. to make learning Mathematics easier.

METHODS

This research is categorized as research and development (R and D Research). This research employs procedures such as producing the product and testing the product's effectiveness. So, this research is about producing the Bandicam instructional Video on Math and testing it. The method used in this development research is the 4-D model which consists of 4 stages of development, namely *define*, *design*, *develop*, and *disseminate* (Anwar, 2020). The 4-D stages are as follows: 1) **Define**, including the process of observations. Observations were made for grade VII students of SMP Muhammadiyah 1 Ambarawa to find out the students' needs for video lessons using questionnaires and interviews with mathematics teachers; 2) **Design**, including the process of selecting the format, the media for delivering learning materials, and the process of making the product are the main bases at this stage. The instructional video is developed based on the learning module on the set material; 3) **Develop** (Development), including the process to produce the final form of the instructional video after going through revisions based on comments, suggestions, expert assessments, and tests results data. At this stage, the product that has been revised then be tested on class VII A students of SMP Muhammadiyah 1 Ambarawa to determine student responses to the instructional videos developed. Based on student responses, the instructional video will be improved to get a suitable instructional video to be disseminated; 4) **Disseminate** (Spread), including the process that the instructional videos that have been produced after going through the stages *define*, *designing*, *developing, and disseminated, the video* be published on YouTube so that they can be used by anyone.

The data analysis technique used in managing the data that has been obtained in the stages of *defining, designing, developing, and dissemination* are using qualitative descriptive analysis. This technique is used to classify qualitative data from students' responses about the product in the form of comments, responses, criticisms, and suggestions for improvement that have been outlined in an open questionnaire. While the closed questionnaire given to students was analyzed using the following formula to know the level of feasibility, equation 1 (Purwanto, 2013):

$$NP = \frac{R}{SM}\ 100\% \qquad (1)$$

Explanation:

NP = Percentage value of expected or sought
R = Obtained Score
SM = Maximum Scores

Furthermore, NP is converted into the eligibility criteria or validity according to Akbar (2013) as in Table 1.

Table 1: Criteria or validity

No	Criteria of Eligibility	Level of Feasibility
1	85,01% - 100,00%	Very feasible, or can be used without revision
2	70,01% - 85,00%	Fairly feasible, or can be used but needs minor revision
3	50,01% - 70,00%	Not feasible, it is recommended not to use it because needs major revision
4	01,00% - 50,00%	Not feasible, or should not be used

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RESULTS AND DISCUSSION

Research and development of instructional videos using Bandicam software follow the 4-D development model, namely define, *design, develop*, and *disseminate* producing data as The following:

Define

Activities at this stage, namely analyzing the needs of learning media in the form of instructional videos. Information on the need for instructional videos for class VII students of SMP Muhammadiyah 1 Ambarawa was obtained through interviews with teachers and data mining through questionnaires. Based on the results of the interview, it was found that students' motivation and interest in learning mathematics were still very minimal, this was because the learning resources used by students were only in the form of student activity sheets (LKS). Teachers have difficulty making interactive learning media that can be used for independent learning by students and are interesting to use. Based on the results of this information, an analysis shows that the lack of motivation and interest in students to learn mathematics is due to the lack of learning resources.

In addition to interviews, this stage also explores information about students' needs for mathematics instructional videos, especially on-set material. This information was obtained through a questionnaire distributed to all class VII A students of SMP Muhammadiyah 1 Ambarawa. The results of the questionnaire analysis of 22 students are as in table 2, table 3, and table 4.

Table 2. The level of difficulty of students at set material

No.	Indicators	Statement	Percentage
1	Set Materials	a. Difficult	77,27%
		b. Easy	22,72%
2	Factors that cause difficult set material	a. Using many symbols and pictures	77,27%
		b. Understanding the concept	22,72%
3	Knowledge of the material set related to everyday life	a. Interested	90,90%
		b. Not interested	9,09%

Table 3. Level of students' comprehension and interest in the worksheet (LKS) being used

No	Indicators	Statement	Percentage
1	Worksheets (LKS) provided by the school are interesting	a. Yes	9,09%
		b. No	90,90%
2	The habit of reading worksheets (LKS)	a. Yes	95,45%
		b. No	4,54%
3	The material in the worksheets (LKS) is easy to understand	a. Yes	18,18%
		b. No	81,82%
4	The examples given in the worksheets (LKS) are related to daily life	a. Yes	22,73%
		b. No	77,27%

Table 4. Display instructional videos that are interesting to learn

No	Indicators	Statement	Percentage
1	Instructional videos display sound and images	a. Agree	100%
		b. Disagree	0%
2	Need other Instructional videos such as video lessons for independent learning	a. Agree	100%
		b. Disagree	0%
3	Instructional videos contain interesting pictures	a. Agree	100%
		b. Disagree	0%
	Instructional videos display material explanations	a. Agree	100%
		b. Disagree	0%
4	Instructional videos display example explanations	a. Agree	100%
		b. Disagree	0%
5	Instructional videos dis examples of sets in everyday life	a. Agree	100%
		b. Disagree	0%

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Based on the analysis of questionnaire data and interviews with mathematics teachers, it can be concluded that students have difficulty understanding the set material because the material presented in the worksheets displays a lot of symbols and rarely links examples of sets in everyday life. All students stated that they needed learning media in the form of instructional videos that displayed material along with examples related to everyday life.

Design

This stage is the stage of compiling a mathematics instructional video. Before the instructional video is compiled, the materials to be discussed in the set are mapped first. The results of the mapping of the material that will be presented in the instructional video are the definition of the set, declaring the set, the empty set and the universal set, the Venn diagram, the properties of the set, the operation of the set, and the properties of the set operation. Furthermore, the preparation of the draft material in the form of a power point is carried out. The draft material will be used as an instructional video using Bandicam software. The results of the draft materials and instructional videos are as in Figure 1 and 2.

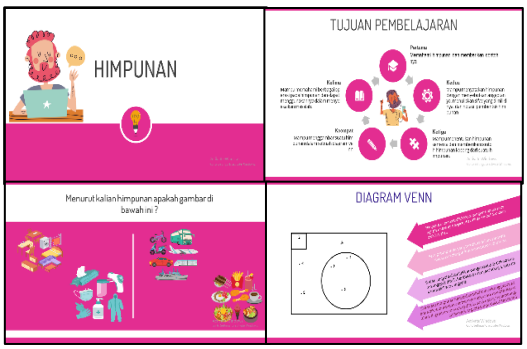

Figure 1. Draft material in the form of power

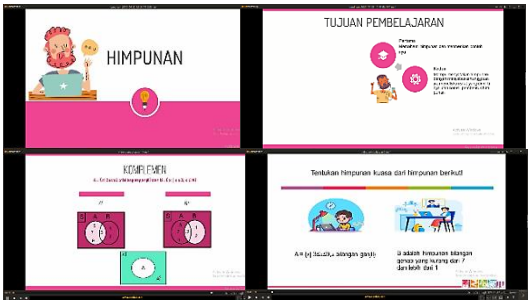

Figure 2. Planning of the instructional video

Develop

Activities carried out at this stage are to conduct a feasibility test of the mathematics instructional video to validators or experts, as well as field trials that way, aim to see student responses to mathematics instructional videos. The results of the validator feasibility test and field trials are described in Figure 3.

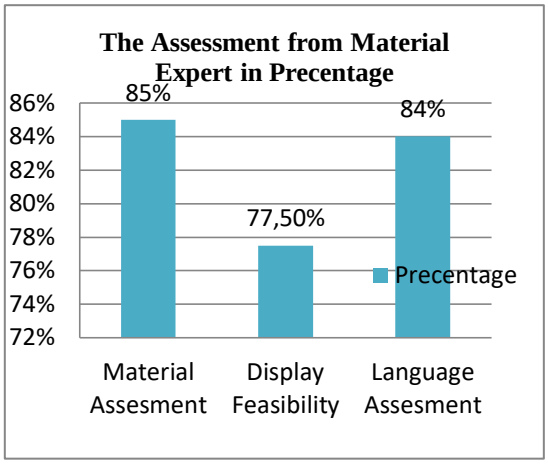

Figure 3. Assessment from material experts in percentage

Based on Figure 3, it can be concluded that material experts provide an assessment of the material aspects of 85% with the category quite feasible or usable but it needs to be slightly revised, in the presentation feasibility aspect, it was 77.5% with the category quite feasible or usable but it needed a little revision, and the language aspect was 84% with the category quite

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feasible or usable but it needed a little revision. So that the average assessment obtained from material experts is 82, 33% with the category quite feasible or usable but needs to be slightly revised. As for things that need to be revised based on suggestions and input from material experts, namely: 1) The narrator in explaining the material or the concept of the set, both in the operation of the set or the properties of the set, should relate the concept to the previous concept, so that there is a link between concept one and the concept that is others; 2) The instructional video should include an invitation in the form of motivation so that students are more active in learning; 3) The narrator should explain the terms or symbols shown in the instructional video.

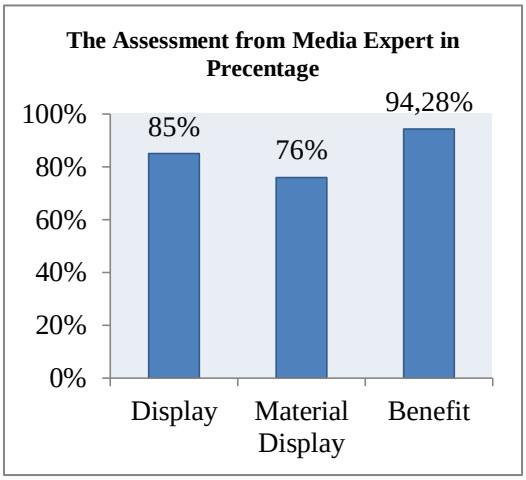

Figure 4. Assessment of media experts in percentage

Based on Figure 4, it can be concluded that the media expert gives an assessment of the display aspect by 85% with the category of being quite feasible or usable but it needs to be revised slightly, the aspect of presenting the material is 76% with the category quite feasible or it can be used. used but needs minor revision, and the benefit aspect is 94.28% which is categorized as very feasible or can be used without revision. So that the average assessment obtained from media experts is 85.09% in the very feasible category or can be used without revision. Some things need to be revised based on suggestions and input from media experts, namely: 1) The narrator's voice is less clear; 2) You should use a background that is not too flashy so that it is cool to the eye; 3) The illustration image breaks when displayed on the instructional video.

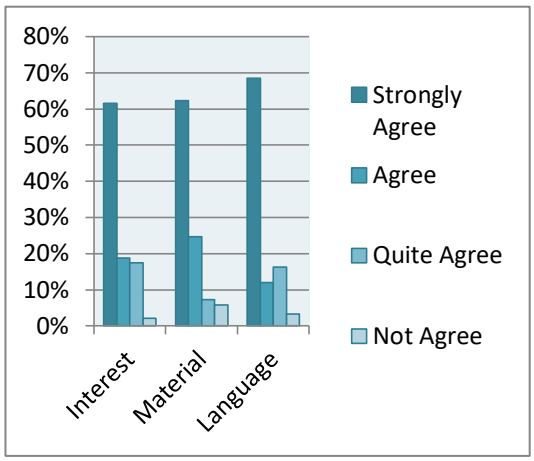

Figure 5. Student responses to instructional videos

Based on Figure 5, the conclusion is that the percentage of students who respond strongly agree and agree on the interest indicator of 80.44%, the material indicator is 86.96%, and the language indicator is 80, 44%. So that the average percentage of students who responded strongly agreed and agreed with the mathematics instructional video was 82.61%. This means that 82.61% of students gave a positive response to the existence of mathematics instructional videos.

Disseminate

At this stage, the instructional videos will be published to all seventh-grade students of SMP muhammadiyah 1 ambarawa as a source of student self-

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study. The disseminated instructional video has been declared suitable for use based on the assessment in the previous stage.

The display of the video image of the development of mathematics learning can be seen in Figure 6.

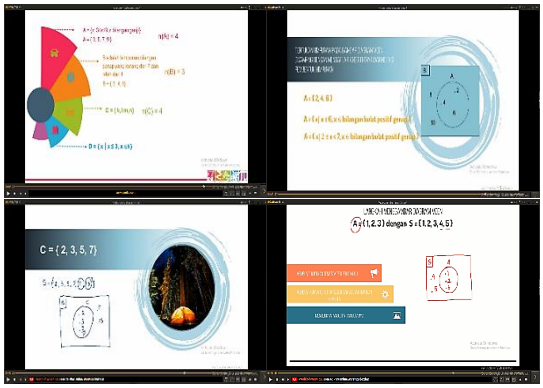

Figure 6. Disseminated instructional videos

The research finding supported the result of research conducted by (Suantiani & Wiarta, 2022) which revealed that instructional videos can increase student interest and learning achievement. In addition, (Wulandari, 2020) and (Andriani & Sunismi, 2019) also stated that efficient instructional videos are used in online learning.

However, based on the research findings, there are several the advantages that the coverage of the material discussed as a whole start from conceptual, procedural, and application knowledge in everyday life. The video also provides an interesting display of material with interactive and communicative narrator language so that it will arouse students' interest and enthusiasm for learning. This research finding supports the previous research (Sinaga, 2020) creating videos using Bandicam as a media in learning mathematics impacts the effectiveness of learning mathematics during online learning. (Dayutiani & Fitrianna, 2021) also shows that video created using Bandicam is an effective learning medium used as an online learning medium for Mathematics during the pandemic, seen from an interest in learning, response, and the activeness of students as well as the use of learning videos online or distance learning Mathematics during a pandemic. Moreover, (Khotimah et al., 2021) revealed that there is an effect of problem-based learning-based Bandicam media to improve students' problem-solving abilities on students' mathematics learning outcomes. On the other hand, this instructional video also has a weakness, namely, it has a large capacity so it requires an adequate network and device to be able to download it.

The implications from research findings are; if the teacher want to create instructional video using Bandicam application, the material should be prepared first because it has not be too long in duration. The teachers also has to mind the timing of video in order not to make it long duration and high capacity that can cause the video hard to be played and downloaded. Another implication from research findings is if the material is short, the capacity will be low and it makes the video is easy to play and share on any online platform.

CONCLUSION AND SUGGESTION

Based on the results of the research and discussion, it can be concluded that this study produced a product, namely an instructional video on the set material for grade VII students of SMP Muhammadiyah 1 Ambarawa. Instructional videos are developed with a 4-D model, namely *define*, *design*, *develop*, and *disseminate*. The results of the validator

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feasibility test at the development stage, namely the material expert of 82.33% with the category quite feasible or usable but it needs a little revision, and the media expert at 85.09% with the very feasible category or can be used without revision. Meanwhile, the student response, which was 82.61%, stated that they strongly agree and agree with the mathematics instructional video on the set material. Thus the mathematics instructional video on the set material produced in this study is suitable for use and dissemination. The suggestion is that teachers can use instructional videos as an alternative in carrying out online learning or limited face-to-face learning whose learning activities are mostly done at home.

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