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Development of Audio Visual Based Learning Media on Technical Drawing Subjects

(Case Study in SMK Negeri 1 Sumedang, Bandung)

Aldo Dwi Hervindo, Lilis Widaningsih, Lucy Yosita*
Department of Architectural Engineering Education, Faculty of Technology and Vocational Education
Universitas Pendidikan Indonesia
Bandung, Indonesia
aldodwihervindo@gmail.com

***Abstract*—The background of this research is the inhibition of learning process in schools, including in vocational schools, due to the outbreak of Covid-19 virus pandemic in Indonesia, thus causes the learning process must be done online. However, in the implementation of learning process, students feel less interested and constrained by the learning process. In the other side, teachers also feel that the use of current learning media is ineffective and less attractive. The purposes of this research is to develop audio-visual based learning media to becomes a decent learning media and also to find out student's responses of the the products resulting from the development of these media. The research method used in this research is "Research and Development". This research was carried out through six stages of research, that is (1) Problem and Potensial Collection; (2) Infromation Collection; (3) Developing design of product; (4) Design Validation; (5) Revising Product Design; (6) Product Testing; and if necessary, there will be stage (7) Revising Product. Sample of this research ammounted to twenty one students as the representative of X DPIB class who took Technical Drawing subjects. The instruments used in information collection were interview guides and questionnaries, as instuments of design validation and student response taking. The results of this study are the products of the development of audio-visual based learning media in the form of learning videos that are suitable for use in learning and show a good response from students where the learning process becomes more attractive to students.**

Keywords—social media, WhatsApp, Instagram, student motivation learning

I. INTRODUCTION

In 2020, there are problems in the process of getting education in Indonesia. The outbreak of the Covid-19 pandemic made the learning process compulsory at home, so the face-to-face process between teachers and students was hampered. This happened at SMKN 1 Sumedang where technical drawing learning was carried out online and online.

Based on the results of interviews with technical drawing's teacher, the teacher feels that the learning process is slower in its implementation when done online. The teacher feels that students' interest and attractiveness is low in following the online learning process. That teacher's opinion was strengthened by the results of interviews conducted with several students who took part in the online teaching and learning process of technical drawing subject. Students admit to being bored in the online learning process. On the other hand, the limited internet quota that students have to access the internet is also an obstacle that causes some students to often be late in participating in the learning process. Students want learning to be carried out like in a classroom, where the teacher feels like teaching directly, but it doesn't drain internet quota much.

Researchers in this research intend to try to provide solutions and help the online learning process by developing learning media in technical drawing subjects. Learning media that are considered relevant to be developed in online learning is audio-visual media in the form of learning videos. Videos can help teachers to motivate students and explain subject matter so that teachers do not need to explain the material being taught repeatedly, but the efficiency and effectiveness of learning can still achieve optimal results. Learning videos can provide teaching materials such as in class, without having to meet directly face to face. This video can then be shared on social media such as WhatsApp and YouTube with the aim that late students can still access it and adjust their own video resolution and the internet quota used will be more economical.

II. RESEARCH METHODS

The research method used in this research is Research and Development (R & D) with the population as the research object, is class of X DPIB with a total of 108 students. The sampling technique used in this research is purposive sampling, with a total sample of 21 students from three class of X DPIB at SMKN 1 Sumedang.

The research and development of this learning media will apply the Sugiyono development research model (2011:409), there is: potential and problems, data collection, product

design, design validation, design revision, product testing, product revision, then testing of use and mass production. However, in the implementation of this study the researchers did not carry out the trial phase of use and mass production. This is in accordance with the purposes and conditions of the need of this research is to develop learning media based on learning videos that are feasible according to the Technical Drawing subject teacher and media expert for online learning use at SMKN 1 Sumedang.

The data collection techniques in this study were interviews and questionnaires, so the research instruments used were interview guidelines, expert validation instruments, student response questionnaires, and the criteria from the learning video itself. The data analysis technique in this study was carried out qualitatively and quantitatively. Qualitative data analysis was carried out on criticism, comments, and suggestions obtained in an open questionnaire in the expert validation instrument and student response questionnaires. Data analysis on the results of the answers to the expert validation instrument and student response questionnaires was carried out quantitatively by calculating the percentage of feasibility of the products developed by audio-visual based learning media.

III. Development of Audio Visual Based Media in the Class

This research on the development of audio-visual based learning media aims to develop audio-visual based learning media in technical drawing subjects at SMK Negeri 1 Sumedang and to determine student responses to audio-visual based learning media development products. The development process is carried out through six stages starting from collecting potentials and problems, collecting data, and designing the product itself. The next stage is product design validation, product revision and testing, which is described as follows:

A. Analysis of Design Validation Results

1) Media design validation results: Based on the results of media validation on the design of audio-visual based learning media that has been designed, the percentage of feasibility in the audio and visual aspects is 87.5%, and is classified in the "Very Good" criteria. A good percentage result is also shown in the aspect of using software and supporting media, namely with a percentage of 87.5% which is also included in the "Very Good" criteria. In contrast to the audio and visual aspects as well as aspects of software and supporting media, the delivery aspect of the subject matter shows a fairly small percentage of feasibility, namely 41.6%, which is included in the "Poor" category. See table 1 bellow.

TABLE I. Percentage of Media Design Validation Results (1st Try).

No.	Aspect	Observation Score Result	Expected Score	Percentage
1	Audio and Visual	28	32	87,5%
2	Subject Matter Delivery	5	12	41,6%
3	Software and Supporting Media	7	8	87,5%
Total		40	52	76,9%

Although the total percentage of media validation shows a total percentage of 76.9% and falls into the "Very Good" category, the revision process still needs to be carried out to correct deficiencies in the aspect of subject matter delivery. The shortcomings that need to be fixed in the learning video are revised by considering some of the input written in an open questionnaire. The revision results on audio-visual based learning media also resulted in an increase in the percentage of feasibility in the results of the second stage media validation. Based on the results of the second stage media validation, there was an increase in the percentage of the audio and visual aspects as well as the delivery of the subject matter, namely the percentage of the feasibility of the audio and visual aspects increased to 90.6% and the delivery aspects of the material to 83.3%. The percentage of eligibility results in both aspects is included in the "Very Good" category. A high percentage increase was found in the aspect of subject matter delivery. Submission of subject matter in the revised video is delivered using an easier understanding for students and does not use “rigid” language. In the aspect of software and supporting media, the percentage of eligibility is still 87.5%, and is included in the "Very Good" category. The percentage of total feasibility of the second stage media validation results was 88.46%, so it was included in the "Very Good" category. See table 2 bellow.

TABLE II. Percentage of Media Design Validation Results (2nd Try)

No.	Aspect	Observation Score Result	Expected Score	Percentage
1	Audio and Visual	29	32	90,6%
2	Subject Matter Delivery	10	12	83,3%
3	Software and Supporting Media	7	8	87,5%
Total		46	52	88,46%

The final percentage of validation results from media experts is 88.46%, and is included in the “Very Feasible” category. This percentage is higher than the percentage of media validation results in the study conducted by Bustanil et al. (2019), where the percentage of their videos is 88%. The thing that makes the difference here is because there are different aspects, namely the aspect of subjet matter delivery. Aspects in the process of developing audio-visual based

learning media are divided into audio-visual aspects, material delivery, and software and supporting media, so that they have more assessment indicators. The more indicators, the more detailed the assessment of the product will be.

2) Subject matter design validation results: Based on the results of subject matter validation on the design of learning video products that have been designed, it can be seen that the content of the subject matter aspect has a percentage of 91.67%. This percentage shows that the aspects of the material content in the instructional video have very good criteria. Meanwhile, the percentage of the subject delivery aspect is 77.78% and is included in the very good criteria. See table 3 bellow.

TABLE III. PERCENTAGE OF SUBJECT MATTER DESIGN VALIDATION RESULTS (1ST TRY)

No.	Aspect	Observation Score Result	Expected Score	Percentage
1	Subject Matter	11	12	91,67%
2	Subject Matter Delivery	28	36	77,78%
Total		39	48	81,25%

Although the results of the first stage of subject matter validation indicate that the percentage of aspects of subject matter delivery is included in the “Very Feasible” criteria, revision and re-validation were carried out. This is due to the similarity of input and shortcomings of both media experts and subject matter experts in the aspect of delivering the subject matter.

The results of the second stage of subject matter validation showed an increase in the percentage both in the aspects of the content of the subject matter and the aspects of the delivery of the material. The percentage in the content aspect of the subject matter is 100% and is included in the "Very Good" criteria. Meanwhile, the percentage in the aspect of subject matter delivery is 88.89%, which is still in the "Very Good" criteria. The increase in the aspect of delivering subject matter is caused by changes that occur in the delivery of subject matter, where the delivery of subject matter uses communicative language for students. Submissions are delivered by choosing sentences that are easier to understand and not standardized or “textbooks”. The implementation of revisions in the learning video product design also increases the total percentage to 91.67% and in the criteria of "Very Good". See table 4 bellow.

TABLE IV. PERCENTAGE OF SUBJECT MATTER DESIGN VALIDATION RESULTS (2ND TRY)

No.	Aspect	Observation Score Result	Expected Score	Percentage
1	Subject Matter	12	12	100%
2	Subject Matter Delivery	32	36	88,89%
Total		39	44	48

B. Analysis of Student Responses to the Results of Learning Media Based on Audio-Visual

The last stage carried out in research on the development of audio-visual based learning media is the product trial stage. Product trials are carried out by looking at student responses to product design in the form of learning videos that have been designed and developed through limited trials. The results of student responses to learning videos show a high percentage of aspects of material delivery, audio and visual aspects, and aspects of the attractiveness of the video. The percentage of the subject matter delivery aspect is 87.24%, so the delivery aspect is in the “Very Good” category. The audio and visual aspect has a percentage of 83.07% and is also included in the "Very Good" category. The last aspect is the attractiveness of the video, which shows the percentage in the "Very Good" category, which is 83.93%.

TABLE V. THE PERCENTAGE OF STUDENT ASSESSMENT RESULTS IN TERMS OF ASPECTS AND INDICATORS

No.	Aspect	Indicator	Indicator Score Total	Max. Score	Indicator Percentage	Percentage of Aspect	Total
1	Subject Matter Delivery	1	76	84	90,48%	87,24%	84,75%
		2	75	84	89,29%		
		3	76	84	90,48%		
		4	76	84	90,48%		
		5	64	84	76,19%		
		6	77	84	91,67%		
		7	69	84	82,14%		
2	Audio and Visual	8	67	84	79,76%	83,07%	
		9	72	84	85,71%		
		10	73	84	86,90%		
		11	71	84	84,52%		
		12	66	84	78,57%		
		13	64	84	76,19%		
		14	68	84	80,95%		
		15	74	84	88,10%		
		16	73	84	86,90%		
3	Attractiveness	17	69	84	82,14%	83,93%	
		18	70	84	83,33%		
		19	70	84	83,33%		
		20	73	84	86,90%		

If the results of student assessments are analyzed in terms of indicators, the highest assessment on the aspect of material delivery is in indicator number six, with a score percentage of 91.67%. This indicator discusses the order of the material. With this assessment, students answered that the material presented was very organized and systematic.

Even though in the aspect of subject matter delivery the average score is in the very good category, the assessment of the aspect of subject matter delivery in indicator number five, namely regarding the duration of material delivery is still small. This indicator received an assessment from students with a score percentage of 76.19%. Some students rated the videos as good in duration and tended to be too long. Weaknesses in this indicator can be affected by differences in the number of internet quota students to access learning videos.

The next aspect is the audio and visual aspects. High assessment in this aspect is found in indicator number fifteen, namely accessibility. Students give an assessment with a score percentage of 88.1% on this indicator. Based on this assessment, students responded that the audio-visual based learning media was easily accessible.

Different ratings in audio and visual aspects are found in indicator number thirteen. This indicator has a low rating when compared to other indicators in a similar aspect. The percentage of the score obtained based on the results of the student response questionnaire on this indicator shows a value of 76.19%. This shows that the students responded that the text in the learning video could not be read clearly by some students. Things that can lead to deficiencies in these indicators are the differences in the devices used by students and the quality of the videos they watch. The maximum quality of the video presented is 720p, where students can adjust the video quality according to their internet quota. Another trigger that can cause deficiencies in these indicators is the too small selection of the size and color of the letters in the learning video. Even so, the results of the assessment are still in the very good category.

The last aspect that shows the student's response to audio-visual based learning media is the aspect of attractiveness of the video. The percentage of the four indicators given shows a very good response. Students feel the learning process feels easier and more interesting in its implementation. This is shown in the assessment of students in indicators of ease of implementation and attractiveness of learning media, namely 82.14% and 83.33%. In addition, students also feel more enthusiastic in implementing it. This is shown by an assessment of 83.33% on indicator number nineteen. Students also have the desire to watch it again if they don't really understand the material they get. This is shown in the results of student assessments on the indicators of media reuse, with a percentage are 86.09%. Can be seen on figure 1.

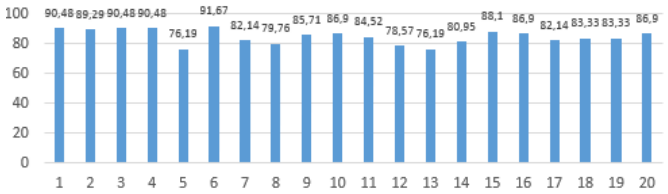

Fig. 1. Diagram of indicator based value (%).

The comments and suggestions received regarding the learning video are written in an open questionnaire that has been given to students. Students gave positive comments about the learning video, where students stated that the learning video was interesting and could deliver subject matter well and communicatively. However, some students complained about the size of the text in this instructional video. Some students felt that the text size in this instructional video was too small. However, this indicator has an assessment of 76.19%, and belongs to the very good criteria, so that the improvement of the text in the learning video is sufficient.

Based on the results of the analysis of student responses to the products of the development of audio-visual based learning media, the learning video is suitable for use in the learning process in Technical Drawing subjects. So, the stages in this research were sufficient and limited to this stage and did not enter the product revision stage.

IV. Results And Conclusion

The research on the development of audio-visual based learning media was carried out on students of SMK Negeri 1 Sumedang who took the Technical Drawing subject, which had to be carried out online. This research has succeeded in developing audio-visual based learning media in the form of products si learning video, which can be used as an alternative to online learning media.

Based on the results of the research, it can be concluded that the product of the development of audio-visual based learning media in this study is a learning video that is suitable for use in Technical Drawing subjects. Learning videos that are suitable for use as teaching media are compiled and designed according to the needs of teachers and students. To get data about what students need, the data collection process can be carried out by conducting interviews with these students. The results of data regarding the needs of students are then adjusted to the course syllabus along with the needs of the field teacher itself. The results of the product design then enter the validation process regarding the feasibility of the video to media and subject matter experts. The validation results obtained can then be used as material for revisions or improvements regarding the product design that has been designed. However, this research has an implementation stage that is limited to the product trial stage. Researchers hope that other researchers who carry out similar development research can carry out the research process up to the trial use stage so that the results of these research products can be mass produced at the next stage. In addition, the results of this

development research indicate that students show good responses to the development of audio-visual based learning media. This shows that the instructional video is suitable to be used as a learning medium for them. Students feel the learning process feels easier and more interesting in its implementation.

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