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Development of Media Learning by Video-Based Textile Fiber Combustion Test in Vocational High School

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Article Info

Keywords

Learning Media
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Textile Materials

Abstract

This study aims to develop video-based textile fiber burning test learning media, test the feasibility of the media through expert validation, and determine student responses to video media. The type of research is Research and Development (R & D) with the Borg & Gall development model. The data collection technique used in this research is a questionnaire (questionnaire). The data analysis technique used descriptive statistical analysis. The results of the research are: 1) Video-based media development is carried out through media preparation procedures covering several stages, namely a) potentials and problems by analyzing student needs; b) collection of required data and information; c) product design, namely making product designs; d) design validation is carried out by media and materials experts; e) design improvements in accordance with the revisions provided by media and materials experts; f) small-scale trials; g) Product revision; h) limited scale trial; 2) the video-based learning media developed is included in the very appropriate category for use based on the assessment of material experts by 100% and media expert assessments of 96.67%; 3) student responses to the use of video-based learning media through a small-scale test showed a very good category of 82.26% and a limited-scale test of 86.01% included in the very good category.

Keywords: Learning Media, Video, Textile Materials

Introduction

Media learning is one of the part that can support the success of the learning process. Learning media is an important factor because it helps the teacher's process in delivering the material so that it will be easier for students to understand the material that the teacher have been given. New technologies are starting to appear to support the development of innovative learning by media. Media development can use information and communication technology such as video so that the teaching process does not take place monotonously and runs more pleasantly and students are enthusiastic in accepting learning.

Based on the 2013 Revised Curriculum syllabus of Fashion Design Vocational School, the knowledge subject of textile materials is one of the basics of vocational competence. Materials textile knowledge is a subject that must be achieved by vocational students in the field of fashion expertise. Textile material knowledge is a subject that teach knowledge about the origin of textile materials, the properties of textile materials, the use of textile materials, how to maintain textile materials, and how to test the combustion of textile fibers.

Textile material knowledge subjects are the basic knowledge of yarn spinning, fabric construction thus testing of fibers and materials. The goal of textile subjects is as a basic knowledge for students the making of cloth process that processed from fiber, yarn spinning, fabric construction to fiber and material testing [1]. The knowledge subject of textile materials is important for students who want to go into the world of fashion, the knowledge required to explore, select, produce, use, and care for various types of textile materials. Students are taught to identify the origin of textile fibers by using a combustion test. The combustion test is carried out with wax and patchwork, and students can identify the origin of textile materials fibers.

The observations have been made at Moyudan Islamic Vocational School showed that each classroom is equipped with media such as a blackboard, while there is only one Liquid Crystal Display (LCD) that used interchangeably. The learning media used are whiteboards, power points, worksheets and modules for theory learning. The method used by the teacher is a lecture method. This method make students passive and pay less attention to the teacher in receiving learning in the classroom. This video-based media is expected to help teachers deliver more interesting material and increase students' interest in learning to be more active in learning activities, so difficulties in learning textile material knowledge can be minimized by use of learning media in the form of videos.

The learning process consists of several components that interact with each other. These components are objectives, materials, learning methods and strategies, media and evaluation [2]. One component that has an important role in realizing learning objectives is the media. Learning media is the media which is used as tool and material for learning activities, because the teaching process is essentially a communication process, delivering messages from the introduction to the recipient [3]. The message delivered in the form of teaching materials for learning materials to achieve learning objectives. Learning media has three main functions if the media is used for individuals, groups, or groups of listeners that are large in number, to motivate interest or action, presenting information, and giving instructions [4]. In particular, the function of the media in the learning process is to increase motivation in learning activities, clarify the material delivery, increase student concentration in the learning process and provide information to students. Video is an audio-visual media that displays motion pictures of live and sound from recordings of real events that occur so that the message delivered is factual (important events, news or form of fictional story) [5]. The capabilities of video are displaying live images, deliver information, describing a process accompanied by sound. Other capabilities of video media include being able to manipulate space and time. Video media can make students more active in class because they want to find out about what is made in the video.

The benefits of video media for the learning process are useful for attention attracting of students in delivering teaching materials, develop learning motivation, provide learning experiences by delivering educational from a video presented [6]. Another benefit of video media in the communication process becomes more efficient, time and distance. The use of video-based learning media is expected to assist teachers in delivering more interesting material and increase student interest in learning to be more active in learning activities.

Method

This type of research is Research and Development (R & D). The Research and Development (R & D) method is a research method that produces a product in a particular area and has the product effectiveness [7]. This research was conducted in the 2020/2021 at Moyudan Islamic Vocational School that is located at Street of Gedongan - Klangon, Rice Fields Area, Sumberagung, Moyudan sub district, Sleman Regency, Special Region of Yogyakarta 55563.

This study consisted of material expert and media experts as expert judgments, and class X students as subjects. The material experts consist of 2 people, which is FWCE lecturers and vocational high school teachers who are experts in the textile material knowledge subject. Media experts consist of 2 people, which are FWCE Study Program lecturers and vocational highs school teachers who are experts of media learning, while class X students Fashion Design become respondents in the developed learning media. This research object is the development of video-based learning media in the subject of knowledge of textile materials.

Development model that used is the procedural model. The media preparation procedure includes 10 stages, involving potential and problems, data collection, product design, design validation, design improvement, usage trials, product revisions, product trials, product revisions, and mass production [8]. The first stage is the potential and problems, the potential in this research can create learning media by using the technology. The problem is that the media used by the teacher is monotonous and made students less interested in learning participation. This problem can be solved with R & D research. The second stage is data collection which intends to collect information that needed for planning materials. The information can be in the form such as learning aids, books, and modules. The third stage is product design which intends to explain the materials to be used, the tools used and work procedures or steps for making videos. The fourth stage is design validation which is carried out by attending to the experienced person. The fifth stage is design improvement intends at improving product designs that have gone through a design validation process by the experts. The sixth stage is small-scale product testing and product revision. The last stage is a limited-scale product trial.

The techniques of Data collection are the methods used by researchers to collect the research data. The data collection technique used in this research is a questionnaire technique. The questionnaire was shown to evaluate the properness of the video based textile fiber combustion test learning media developed. The method used to state the statement items and how to respond to it is in the checklist form. The checklist is a statement that respondents that have been evaluated just need to puţ a checklist (√) in the space provided.

The research instrument is a device that used to measure the observed natural and social phenomena. These instruments are used to measure variables in the natural sciences which are available and tested for its validity and reliability. Data analysis technique that used in this study is a descriptive statistical technique to describe the data that has been collected as it is without analyzing and making deviation that apply to public [8]. The data obtained through a questionnaire by media experts, material experts, and students are in the form of qualitative values which will be converted into quantitative values. In this study, researchers took data by using a questionnaire and using the Guttman scale for media experts and material experts, and a Likert scale for students. In order to determine the properness of the rating, tables 1 and 2 can be made as follows :

Table 1. Video Eligibility Category by Experts

Eligibility Category	Interval Score
Proper	(Skor min + p)≤Skor≤Skor max
Not Proper	Skor min≤Skor≤ (skor min + p -1)

Table 2. Student Categories Response to Video Media

Eligiblity Category	Interval Score
Very Good	(Smin + 3p) ≤ S ≤ Smax
Good	(Smin + 2p) ≤ S ≤ (Smin + 3 p – 1)
Not Good	(Smin + p) ≤ S ≤ (Smin + 2 p – 1)
Not Very Good	(Smin) ≤ S ≤ (Smin + p – 1)

The overall rating of the learning media aspect was rated by the media experts, material experts and quantitative results students with. The values that have been obtained, then described quantitatively and then interpreted according to tables 3 and 4 as follows:

Table 3. Interpretation of Video Media properness rating by Experts

Rating Category	Interpretation
Proper	Media experts and material expert declare that video in textile material subject is proper if image, audio, text, motion, material, and language have 80% score
Not Proper	Media experts and materials experts declare that video not suitable to be used as a learning resource if images, sound, text, motion, material and language have score less than 80%.

Table 4. Interpretation of the Eligibility Category of Learning Media by Students

Categories	Interpretation
Very Good	Students are very easy to understand the material, understand the language that used in video media and very attractive from appearance of video
Good	Students are easy to understand the material, understand the language that used in video media and attractive from appearance of video
Not Good	Students are not easy to understand the material, not understand the language that used in video media and not attractive from appearance of video

Categories	Interpretation
Not Very Good	Students not very understand the material, not very understand the language that used in video media and not very attractive from appearance of video

Results and Discussion

Results

1. Media Expert Validation

Validation by media experts purpose to provide a rating of video learning media products. These aspects include the image and the sound aspect. The results of media experts on video learning media, totaling 2 experts, showed that of the 30 statement items, 29 items (96.67%) were rated with a score of 1 (proper) and 1 item (3.33%) was rated with a score of 0 (not acceptable). Data on the results of the rating by media experts can be seen in table 5 :

Table 5. Eligibility Results by Media Experts on Video Media

Class	Category	Number of Questions	Percentage
1	Proper	29	96,67%
0	Not Proper	1	3,33%
Total		**30**	**100 %**

The following are the results of the percentage of the properness of video learning media by media experts.

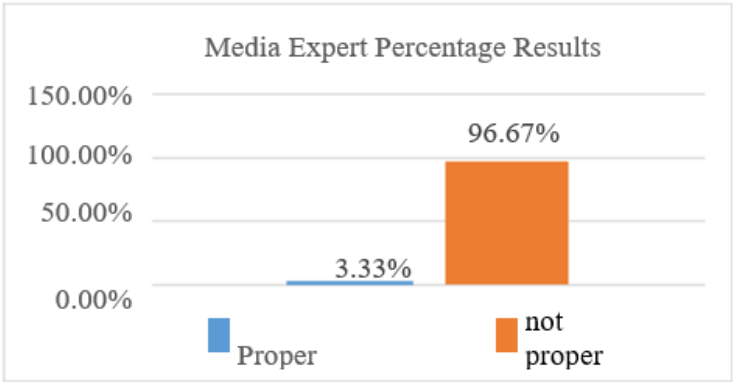

Figure 1. Histogram of Video Learning Media Percentage by Media Expert

Based on the results of table 5 data, it declared that the learning video media for textile fibers combustion is categorized as a proper category by media experts. The fiber combustion test video learning media was declared very proper to use and could be tested on students.

2. Material Expert Validation

Material expert validation is used to rate the material that has been compiled in the video learning media. There are several aspects that are rated, namely the material suitability, language and presentation. The results of the video learning media material experts, 2 experts declared the 30 statement items, 30 items (100%) were rated with a score of 1 (proper) and 0 items (0%) were assessed with a score of 0 (not proper). Data on the results of the rated by media experts can be seen in table 6 below:

Table 6. Material Expert properness Results for Video Media

Class	Category	Number of Questions	Percentage
1	Proper	29	100%
0	Not Proper	1	0%
Total		**30**	**100 %**

The following results of the video learning media rated percentage by material experts.

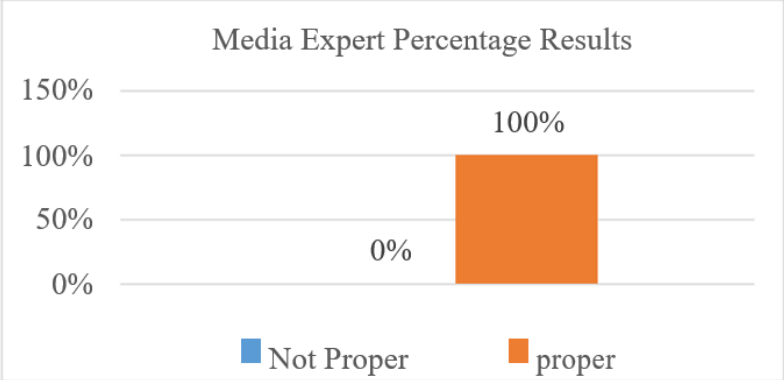

Figure 2. Histogram Percentage of Video Learning Media By Material Expert

Based on the results of table 6 data, it is decalred that the learning video media for the textile fiber combustion test is included in the proper category by material experts. Textile fiber combustion test video learning media was declared very proper to use and could be tested on students.

3. Small scale trial results

The textile fiber combustion test learning media was tested for class X students of Fashion Design at Moyudan Islamic Vocational School, Sleman Yogyakarta. The aspects that rated are the video benefits component, the video display component, the linguistic component and the content proper component. The results of the readability test of the small scale test video learning media that total 6 students showed that of the 108 statements: 54 items (50.00%) were scored with a score of 4 (very good), 53 items (49.07%) were scored with a score of 3 (good), 1 item (0.93%) was rated with a score of 2 (Not good), 0 items (0%) was scored with a score of 1 (not very good). The explanation of the results of small-scale tests on video media is in table 7. as follows :

Table 7. Small Scale Test Results To Video Media

Class	Categories	Number of Questions	Percentage
4	Very good	54	50,00%
3	Good	53	49,07%
2	Not good	1	0,93%
1	Not very good	0	0%
Total		**108**	**100%**

The student responses on a small scale presentation test results can be seen in the form of a histogram on this image 3 below :

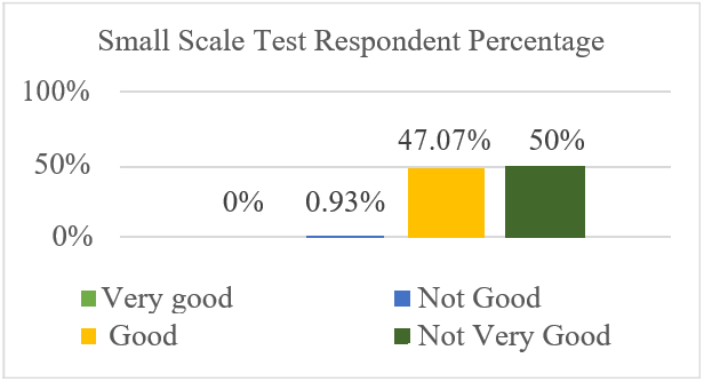

Figure3. Percentage histogram of Video Learning Media by Students on Small Scale Trials

Data result from table 7 is based on the media readability by students show that the overall score of the respondents is 377 with a percentage of 82.25%. Based on the results of the rating of the student's response, it was stated that the video learning media could be used for the learning process of the textile fiber combustion test. The media is good to use, that means students are easily to understand the material and language and interested in display of the video.

4. Small Scale Test Results

The textile fiber combustion test learning media was tested for class X students of Fashion Design at Moyudan Islamic Vocational School, Sleman Yogyakarta and Ma'arif 2 Vocational School, Sleman. The aspects rated are the video benefits component, the video display component, the linguistic component and the content properness component. The results of the readability test of video learning media on a limited scale test totaling 29 students showed that out of 522 statements, 243 items (46.55%) were scored with a score of 4 (very good), 266 items (50.67%) were assessed with a score of 3 (good), 13 items (2.49%) were scored with a score of 2 (not good), 0 items (0%) were scored with a score of 1 (not very good). The explanation of the results of the limited-scale test for video media is in table 8. as follows:

Table 8. Limited Scale Test Results of Video Media

Class	Categories	Number of questions	Percentage
4	Very Good	243	46,55%
3	Good	266	50,96%
2	Not Good	13	2,49%
1	Not Very Good	0	0%
Total		**108**	**100%**

Presentation results of student responses on a limited scale test can be seen in the form of a histogram in image number 4 below:

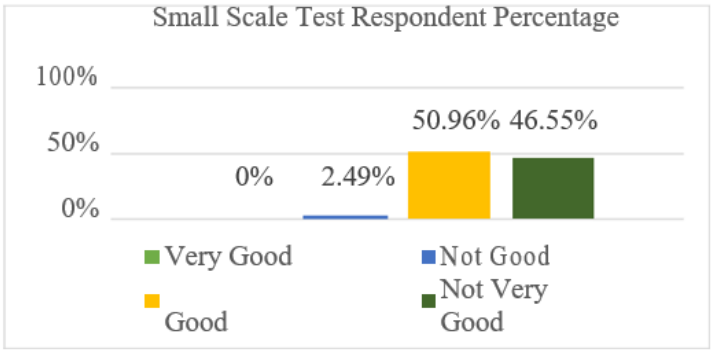

Figure 4. Video Learning Media Histogram Percentage by Students on a Limited-Scale Trial

Data results from table number 8 is based on the media readability by students show that the overall score of the respondents is 1.796 with a percentage of 86.01%. The rating of the student's response declared that video

learning media that used for the learning process of the textile fiber combustion test is good. Proper use of media means that students are easily to understand the material and language and interested in the learning video display.

Discussion

1. Media Development learning by Video based Protein Fiber Combustion Test in Textile Materials Knowledge at Moyudan Islamic Vocational School

The video learning media development for the textile fiber combustion test went through stages with the development procedure. The procedure for developing this media goes through stages which are potential and problems, data collection, product design, and design revision.

The first stage is the potential and the problem. Based on the analysis of this stage, it is known that there are some students who are passive, because the teacher still uses the speech method and conventional media in the process of teaching and learning activities. This causes students to feel bored and less interested in the material presented by the teacher so students' interest in learning material will decreases. The weakness of the speech method are included students being passive but actively taking some notes, and the learning system becomes recitation so it does not refer to understand the material, so an effective learning media is required in learning process [9]. The use of effective learning media can increase learning motivation and reduce the passive students.

The second stage is data collection. Collecting data from many information required to be used as planning material. Planning materials come from information sources like books, teacher subject, modules, internet or journals so that they can develop learning video media on how to test the combustion of protein fiber. The development of learning media is prepared by gathering material designs that are adapted to the syllabus, Learning Implementation Plans and previous observations [10].

The third stage is product design. Product design is the final research results, it can be a new work design, or a new product. The product development process starts from collecting teaching materials, gathering materials, taking pictures and sounds, combining images and audio in a video, after analyzing and collecting data, then the storyboard is gather. Video production process is based on the storyboard that has been made, the steps taken are taking video and video editing. Video media can't be separated from technical aspects like cameras, technical shooting, lighting, editing and sound techniques, if the learning videos made are not in accordance with good work steps, students will have difficulty following learning [11].

The fourth stage is product revision. Products that have been validated by media experts and material experts are require some suggestions for improving learning media from the material and media aspects, revisions were made so that learning media video had optimal results before being tested on a small scale. After the product revision is known to have weakness, the learning media for the textile fiber combustion test video is improved until it is said to be suitable for use as a learning media. Multimedia learning is independent, such as providing convenience and completeness so that users can use the media without the guidance of others [12].

2. Learning Media Properness Test of Protein Fiber Combustion Using Video Media on Textile Materials Knowledge Subjects at Moyudan Islamic Vocational School

The properness of the learning media for the protein fiber combustion test can be seen from the results of the rating media and material experts. The media expert's rating includes the image and audio aspects. The results of the rating by 2 media experts who were analyzed using the Guttman Scale obtained a score of 29, and the validation results of 2 media experts were included in the proper category with a percentage of 96.67%. Material expert rating includes material aspects, linguistic aspects and presentation aspects. The results of the validation by 2 material experts who analyzed using the Guttman Scale obtained a score of 30, and the validation results of 2 material experts were included in the proper category, with a percentage of 100%.

Based by the validation results from media and material experts can be seen that the video learning media for the protein fiber combustion test with the criteria for media preparation from images, sounds, materials, language and presentation are in the proper category. The media that in the proper category means have fulfilled the criteria according to syllabus, according to the learning objectives and is presented in a complete

and systematic way [13]. Validated media with the percentage of results above 80% to 100% can be classified in the very proper category [14].

3. Student Responses to Video Media for Protein Fiber Combustion Test Material on Textile Materials Knowledge Subjects at Moyudan Islamic Vocational School

If the assessment by media and material experts is complete, then the next step is the video learning media for the protein fiber combustion test to be tested on students. This trial phase involved 35 students in the fashion style field of expertise. This trial was carried out in two stages which are a small scale using 6 students and a limited scale using 29 students, the components rating were the benefits of media, video display, language and content properness. Based on the data from the results of small scale trials that held on 6 students as respondents, they were analyzed using a Likert scale (values 4 to 1) with a total score of 377, including in the very good category with a percentage of 82.26%. The data from the limited scale trial that held on 29 students as respondents were analyzed using a Likert scale (values 4 to 1) with a total score of 1,796 included in the very good category with a percentage of 86.01%.

Based on the results of small scale trials and limited scale trials, it can be seen that the video learning media of the protein fiber combustion test is in accordance with the preparation criteria including the components of media benefits, video display, language and content rating is in the very good category. Media readability by students is in the category of very understanding which means it is very easy to understand the material as well as easy access to media for self study [15]. Validated media with the percentage of results above 80% to 100% can be classified in the very proper category [14].

Conclusion

The procedure for developing video based textile fiber combustion test learning media uses a procedure development model. The procedure development model has several stages which are potential and problems, data and information collection, product design, design validation, design improvement, small scale trials, product revisions and limited scale trials. The rating test of the learning media for the textile fiber combustion test was carried out by media and material experts. Based on the rating of media experts with a percentage of 96.67% which in the very proper category and the rating of material experts with a percentage of 100% which in the very proper category. The results of student respondents on the use of small scale textile fiber combustion test video learning media obtained a percentage of 82.26% which in very good category and limited scale obtained a percentage of 86.01% which in the very good category, therefore it can be concluded that the video based textile fiber combustion test learning media is suitable for use in the subject of knowledge of textile materials class X in the field of fashion skills at SMK Islam Moyudan Sleman Yogyakarta

Recommendations

Based on the results obtained, there are several suggestions for several parties. The first suggestion is for teachers, learning media can be used as a choice of teaching media for further learning. The second suggestion for students, it can be used for self study, so if there is material that has not been understood, students can repeat the material by itself. The third suggestion is for other researchers for further research, it is hoped that further research on the effectiveness the use of video learning media of textile fiber combustion test for class X in the field of fashion skills at Moyudan Islamic Vocational School for improving student learning achievement.

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