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Research paper

Application of Video-Based Learning Media Using Videoscribe in Water Resources Development Lectures in Building Engineering Education FPTK UPI

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ABSTRACT

Background: The learning process requires learning media components, one of which is to achieve the expected results. More interactive learning media was created to suit current conditions and accomplish this goal. In this case, the researcher designed and implemented a type of video-based learning media using the Videoscribe program in the Water Resources Development Course to increase students' understanding and mastery of Irrigation Buildings.
Methods: The method used in this research is Research and Development (R&D) and uses the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) development model. The subjects involved in this research were 3 experts for testing media aspects and independent aspects. The results of the validation by three experts obtained very good criteria. The research, it was carried out on students of the Class of 2020 Building Engineering Education Study Program FPTK UPI by holding an initial test, 3 treatment meetings, and a final test.
Result: The research results show that: (1) The feasibility of Videoscribe learning media is included in the Very Good category. (2) There is an increase in student learning outcomes after being given treatment in terms of the average N-Gain value in the medium category.
Conclusion: The feasibility of videoscribe media in the Water Resources Development Course can be said to be feasible to implement, seen from the learning outcomes, students experience increased learning outcomes.

INTRODUCTION

The use of information technology in the world of education has begun to become commonplace in society, starting from primary, secondary, to tertiary education levels, although the variations and focus of its use vary according to each individual's wishes. Technology in education is not a new need, and its use is used in conducive and innovative learning (Tekege, 2017). Various supporting technologies and applications have also been developed as an effort to support and facilitate human life activities, including teaching and learning activities in the world of education. In responding to the development and progress of information technology, lecturers are required to master technology so they can develop learning materials based on information technology and utilize information technology as a learning medium. Information technology is still very lacking in terms of human resources and information technology equipment (Yuliza, 2023).

The aim is to provide convenience and wider opportunities for students to study. Learning problems that occur among students on average involve what they understand in the material and practical learning work steps (Wijaya, Wibowo and Malik, 2024). On the other hand, the presence of information technology as a new technology provides challenges for lecturers to be able to master it so that they can choose and utilize information technology effectively and efficiently in the teaching and learning processes they manage. To make it easier to understand concepts in the learning process, you can use audiovisual aids (Kumar, 2019). effective learning videos to improve student skills (Wisada, Sudarma and Yuda S, 2019).

Entering the era of Society 5.0 which is a development of the Industrial Revolution 4.0, there is a higher demand for the integration of information technology ineducation. In response to the development and advancement of Information Technology, lecturers are required to master technology to develop learning materials based on information technology and utilize information technology as a learning medium. The goal is to provide convenience and wider opportunities for students to learn. On the other hand, the presence of information technology as a new technology challenges lecturers to be able to master it so that they can choose and utilize information technology effectively and efficiently in the teaching and learning process they manage. Providing videos can increase student focus in understanding subjects and increase their interest in these subjects (Nallaswamy, V and R, 2023).

Video is a medium that can be used to innovate in delivering learning material. Video is an audio-visual media that displays movements and sounds that are informative, educational, or instructional (Sadiman, 2014; Widiya, Oktaviana and Utari, 2021). Video can be utilised as a learning media optimally if lecturers can choose the right courses to be delivered through video media Video scribe is a blank screen display that can include images and writing containing words or story concepts (Zulmiyetri, Kasiyati and Kusumastuti, 2019). The video has many advantages (Munadi, 2013), including:

1. Overcoming distance and time constraints
2. Videos can be repeated when necessary to increase clarity
3. Excellent explains a process and skill

4. Develop students' thoughts and opinions
5. Develop learners' imagination
6. Clarify abstract things and provide a more realistic picture
7. Strongly influences one's emotions

There are various forms of video processing applications, one of which is most popular now is the Video Scribe Sparkol application, which has advantages compared to other video processing applications. The use of video scribes can improve student learning outcomes because students can increase learning activities (Ariyati and Nadiar, 2021). One of the advantages of the Sparkol Videoscribe application is that the video results are in the form of a simulation of a hand moving on a whiteboard that follows the writing or image. In conveying illustrations, video scribe images are very suitable for use in explaining material (Utami and Arcana, 2019). Therefore, using Videoscribe Sparkol is very suitable as a video-based learning medium. This is intended so that the resulting video can model the material as it is so that it can increase students' understanding and mastery of the teaching and learning process. Video scribing is very easy to do, seeing as it can be done offline and doesn't always depend on the internet (Rahmadani, Wahyudi and Sahari, 2023). Using the Video Scribe application has been proven to help improve student achievement (Kumar, 2019).

The study program curriculum at Building Engineering Education is a course on the development of water resources. The link between the use of video scribes and the development of water resources in the Building Engineering Education environment is to develop video-based learning media that is more quickly absorbed by students. This is related to the relevance of a person's understanding of the provision of lecture material in the usual way. In learning this Water Resources Development Course requires students to have the ability and competence in the hydrological cycle, water usage patterns, analyzing the quantity and quality of water so that they can make optimal use of water resources, introduction to irrigation buildings, weirs, and dams. To become an educator, you need to be more careful in choosing the latest technology. There are two new technologies, namely computer technology and combined technology (Munawarah, 2019).

In the process of learning about water resources development, students are often hampered by a lack of understanding of the material being taught, so that students' mastery of this subject will be slightly reduced if it is not supported by the development of learning media. a supportive learning environment with relevant material packaged in an interesting and interactive way (Wijaya, Wibowo and Malik, 2024). Therefore, it is necessary to look for special solutions so that learning about water resources development can run optimally. It is hoped that students will be able to absorb learning optimally with the new learning media.

The continued development of science and technology continues to progress, especially in the fields of communication and information which continue to develop rapidly, so there is a need for the development of science and technology in education (Nazgul *et al.*, 2020). The general objective of this research is to design learning media through audio visual and apply it to Water Resources Development lectures at the Building Engineering Education Study Programme FPTK UPI.

METHODS

The type of research used in this study uses the research and development (R&D) method, which is a research method that aims to produce products and assess the effectiveness of the product results (Sugiyono., 2018). The product produced in this study is in the form of videoscribe learning media. The development model used by researchers is the ADDIE model (Analysis, Design, Development, Implementation, Evaluation) (Sugiyono, 2016). This method is effective for developing learning media and increasing student engagement and learning outcomes (Prastiyo, Djohar and Purnawan, 2018).

The stages in ADDIE are detailed as follows:

1. Analysis

At this stage of the analysis aims to analyze the needs and materials so that it can determine what products should be developed. Needs analysis was carried out using the observation method in the Water Resources Development Course, class of 2020 students. At this stage, it obtained the fact that the problems experienced by the course could be solved through the development of video-based learning media videoscribe application which was feasible to develop. Material analysis is carried out to find out the extent to which students still have difficulty in lecturing Water Resources Development so that researchers develop this learning media in this course.

2. Design

At this design stage, researchers design the videoscribe application video-based learning media to be developed. This stage includes collecting materials and materials, planning design concepts, preparing validation instruments for media experts, and compiling test questions (pre-test and post-test).

3. Development

At this stage of development aims to realize the concept of product design that has been done at the design stage by making videoscribe video-based learning media by compiling all components, namely material, images, videos, and questions with videoscribe applications. Then validating the learning media aims to determine the feasibility of video-based learning media videoscribe application.

4. Implementation

At the implementation stage, the videoscribe application video-based learning media that has been valid and feasible will be implemented directly to the research subjects, namely the 2020 batch students of the Building Engineering Education Study Program. The trial was carried out by working on pre-test and post-test questions.

5. Evaluation

This evaluation stage has the aim of assessing the overall product that has been made and whether it meets the specifications or not. This evaluation stage includes external evaluation, namely the results of media expert validation and test results.

The use of this learning media takes into account class conditions and only wants to see how the application of videoscribe video-based learning media in Water Resources Development lectures. Thus, the aim is to see the impact or effect of a treatment or learning

treatment in one class without considering other factors that are considered to affect the treatment.

The sample that became the object of research was students of the S-1 Building Engineering Education study program FPTK UPI Class of 2020 who took the Water Resources Development Course in 2022/2023 totaling 74 people.

RESULTS AND DISCUSSION

A. Learning Media Feasibility Test

Carrying out the feasibility of video scribe learning media was validated by three experts who assessed the feasibility of media with three aspects, namely aspects of material relevance, media aspects, and software aspects.

Table 1.
Media Expert Validation Results I

No.	Indicators	Rating Scale				
		1	2	3	4	5
1	Relevance of material content to the syllabus					√
2	Relevance of the material to Core Competencies				√	
3	Relevance of the material to Basic Competence					√
4	Relevance of the material to Learning Objectives				√	
5	Relevance of the material to Indicators					√
6	Depth of Material				√	
7	Clarity of Delivery Material					√
8	Material Benefits					√
9	Completeness of Material					√
10	The correctness of the material concept refers to the aspect of					√
11	Effectiveness and Efficiency				√	
12	Media Reliability					√
13	Use of Media					√
14	Innovative and Creative					√
15	User Interface (UI)					√
16	User Experience (UX)				√	
17	Creative					√
18	Visual					√ √
19	Animation				√	
Total					6	14
Number X Scale					24	70
Total Assessment				94		
Average Assessment				4,7		
Assessment Category				Very Good		

Based on the data in Table 1, the results show that the average value obtained from the first media expert assessment is 4.7. This value means that from a media perspective, it received a very good assessment. Furthermore, based on the data in Table 2, the results show that the average value obtained from the second media expert's assessment is the same as the first media expert, namely 4.7. This value means that from a media perspective, it received a very good assessment.

Table 2.
Media Expert Validation Results II

No.	Indicators	Rating Scale				
		1	2	3	4	5
1	Relevance of material content to the syllabus					√
2	Relevance of the material to Core Competencies					√
3	Relevance of the material to Basic Competence			√		
4	Relevance of the material to Learning Objectives			√		
5	Relevance of the material to Indicators			√		
6	Depth of Material				√	
7	Clarity of Delivery Material				√	
8	Material Benefits				√	
9	Completeness of Material					√
10	The correctness of the material concept refers to the aspect of					√
11	Effectiveness and Efficiency				√	
12	Media Reliability				√	
13	Use of Media				√	
14	Innovative and Creative					√
15	User Interface (UI)					√
16	User Experience (UX)					√
17	Creative					√
18	Visual					√ √
19	Animation					√
Total				1	4	15
Number X Scale				3	16	75
Total Assessment				91		
Average Assessment (Assessment Category)				4,7 (Very good)		

Table 3.
Media Expert Validation Results III

No.	Indicators	Rating Scale				
		1	2	3	4	5
1	Relevance of material content to the syllabus				√	√
2	Relevance of the material to Core Competencies				√	√
3	Relevance of the material to Basic Competence				√	
4	Relevance of the material to Learning Objectives				√	
5	Relevance of the material to Indicators				√	
6	Depth of Material			√		
7	Clarity of Delivery Material			√		
8	Material Benefits				√	
9	Completeness of Material		√			√
10	The correctness of the material concept refers to the aspect of			√		√
11	Effectiveness and Efficiency				√	
12	Media Reliability				√	
13	Use of Media				√	
14	Innovative and Creative				√	√
15	User Interface (UI)				√	√
16	User Experience (UX)				√	√
17	Creative			√		√
18	Visual				√	√
					√	√
19	Animation				√	√
Total			1	4	4	15
Number X Scale				3	16	75
Total Assessment				91		
Average Assessment (Assessment Category)				4,7 (Very good)		

Table 4.
Expert Validation Results

No.	Validator	Total
1	Expert	4,70
2	Expert	4,40
3	Expert	4,70
	Total	13,80
	Average	4,60

Table 5.
Scale Rating Category Conversion

Score Interval	Value	Category
$\bar{X} < 4{,}2$	A	Very Good
$3{,}4 < \bar{X} < 4{,}2$	B	Good
$3{,}6 < \bar{X} < 3{,}4$	C	Simply
$1{,}8 < \bar{X} < 2{,}6$	D	Less Good
$\bar{X} < 1{,}8$	E	Very Poor

(Sukarjo, 2006)

From the Table 5, researchers refer to the minimum standard of product feasibility that has been determined, namely X ≥ 4.08. The average (X) = 4.60, so the conclusion obtained from expert validation is that Videoscribe learning media is in the "Very Good" category so it can be said to be feasible to be applied to the experimental class.

The data obtained was used for the pretest and posttest scores of each respondent in the experimental group. The data was obtained from the pretest before learning and posttest after learning was carried out. Students' pretest and posttest results were assessed using the predetermined assessment criteria with the N-Gain formula.

$$N - Gain\ (g) = \frac{skor\ posttest - skor\ pretest}{skor\ posttest\ maksimal - skor\ pretest} \quad (1)$$

Table 6.
Average Pretest Score

Experiment Class	
n	74
Xaverage	38,99
Max Value	61
Min Value	21
SD	10,08

Table 7.
Average Posttest Score

Experiment Class	
n	74
Xaverage	73,41
Max Value	93
Min Value	54
SD	10,26

Table 8.
Average Value of N-Gain

Experiment Class	
n	74
Xaverage	0,57
Max Value	0,87
Min Value	0,35
SD	0,13

Based on the results of calculations and data analysis, the average value for N- Gain in the experimental class was 0.57 where the increase was included in the "Moderate" classification.

Table 9.
Interpretation of Normalised Gain

Gain Value	Interpretation
G > 0,70	High
0,30 < G ≤ 0,70	Medium
G ≤ 0,30	Low
G = 0,00	No Improvement
-1,00 ≤ G ≤ 0,00	There was a decrease

(Sundayana, 2016)

CONCLUSION

Based on the results of the research and discussion at all stages of the research carried out by researchers in the Building Engineering Education Study Programme, it can conclude the results of this study, namely: The results of the feasibility test of videoscribe media in the Water Resources Development Course from the experts' assessment that Videoscribe learning media is in the "Very Good" category so that it can be said to be feasible to be applied to the experimental class. Student learning outcomes after being given treatment using videoscribe in the experimental class showed an increase in student learning outcomes from the average pretest and posttest N-Gain scores with the "Medium" category.

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