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Development of Video-Based K3 Learning Media as an Educational Strategy

Retyana Wahrini
Universitas Negeri Makassar

Corresponding Author: Retyana Wahrini retyana.wahrini@unm.ac.id

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A B S T R A C T

The purpose of this study is to produce a video that can aid in the learning process, assess the viability of the film, and ascertain student reactions. This study employs the 4D (Four-D) development paradigm, which consists of the phases of define, design, develop, and disseminate. In order to collect replies to the Occupational Safety and Health (K3) learning film, students were also involved. The study's findings include: 1) interactive learning materials created through the research and development process, with the 4D (Four-D) development methodology utilized; 2) interactive learning materials in the form of instructional films for the Electronic Engineering Education FT UNM course on workplace safety and health, 3) Students' response as users of the learning video media was 95% with a very good category, while the study on the feasibility level of learning videos conducted by material experts obtained a feasibility level of 93% with a very feasible category and media experts obtained a feasibility level of 94% with a very feasible category. According to the findings of this study, students can benefit from using interactive learning materials in the form of instructional videos in the Occupational Safety and Health course in Electronic Engineering Education at FT UNM.

INTRODUCTION

Learning media are tools, methods, and tactics that teachers and students use to communicate in order to increase the effectiveness of their interactions and communication during the school learning process (Heinich, Molenda, Michael, Russell, James D., & Smaldino, Sharon E., 2002). It is impossible to dispute learning media's power to influence technology, especially multimedia technology, given its capacity to integrate text, graphics, animation, audio, and video (Mayer, Richard E., 2009). Standard printed materials are no longer as valuable as interactive computer-based learning tools. Interactive multimedia is one of them. Interactive multimedia is defined as multimedia that has a control device that the user can operate to select the desired outcome for the subsequent step (Smaldino, dkk, 2012). Occupational Safety and Health (K3) is a mandatory course in the Faculty of Engineering at Makassar State University, namely in the Electronic Engineering Education Department at FT UNM. Students' practical work in labs, workshops, and during industrial procedures is based on the Occupational Safety and Health (K3) course (Ridley, J., 2023). Students' practical work in labs, workshops, and during industrial procedures is based on the Occupational Safety and Health (K3) course (Ridley, J., 2023).

One kind of study that is frequently used in the field of education is development research. Research and development in education is more frequently referred to as "research and development" (R&D). Research-based development, or just research-based development, is another term for this research and development. Development research is the process of developing and assessing educational resources (Borg and Gall, 1998). This study takes a step that is cyclical. Studying the research findings of the product to be developed, creating the product based on these findings, conducting field tests in accordance with the environment in which the product will be utilized, and updating the trial results are all part of the research phases or development process. Utilizing the development process to produce new products is the aim of development research. Therefore, a method or set of steps to produce a new product or improve an old one that can be articulated is called development research. Software, including computer applications for data processing, classroom, library, or laboratory instruction, as well as models of education, learning, training, guidance, evaluation, management, and other topics, can be the product. It doesn't always take the shape of tools or materials, like books or lab or classroom learning aid modules.

LITERATURE REVIEW

Occupational safety and health, or K3, refers to all measures taken to protect and ensure workers' health and safety by averting accidents and illnesses related to their jobs. Occupational safety and health (K3), according to Reese (2021), includes all activities intended to guarantee and protect workers' health and safety by averting work-related illnesses and accidents. To reduce the likelihood of accidents when students practice in labs, workshops, or the workplace, occupational safety and health (K3) is one of the most important topics to research (Smith, T., & Johnson, R., 2022). In semester IV, this two-credit general

course can provide students with an overview of K3, which will assist them understand how to apply K3 when conducting lab work. Topics including laboratory hazards, personal protective equipment (PPE) kinds, electromagnetic waves, laboratory dangers, and the causes of laboratory mishaps are all covered in the educational video materials.

METHODOLOGY

Based on the provided background, this study employs the research and development (R&D) type. One type of research methodology used to produce certain products and assess their effectiveness is research and development, or R&D. For this study, an interactive learning tool was developed. The study's test subjects were Electronic Engineering Education students at FT UNM. Since the main objective of this research study is to provide an interactive learning media product in the form of learning videos for the K3 course, the learning video content that has been produced with the greatest amount of work is expected to produce the best results. The steps the author followed to accomplish the research objectives are referred to as the Research and Development Process in the process of creating this educational video content.

A well-chosen development model will result in a product that is both effective and efficient. The correct product will be produced once the development model has been chosen. One of the characteristics that contributes to the correctness of product development results is the product's capacity to be utilized efficiently and benefit users. In keeping with the study's objective of producing interactive media that will be used as a teaching aid, the 4D (four-D) development model is the development approach used in this investigation. Thiagarajan claims that the 4D (four-D) development paradigm consists of four stages of development: define, design, develop, and disseminate.

Since the goal of this research is to create a product that will be tested, the study's subjects are data sources—namely, media experts, material experts, and users—who can serve as testers of the final product. Quantitative analysis is the method that researchers use to examine the information gathered from the questionnaire. The information gathered from the questionnaire that explains if the created learning video is deemed suitable for use as a learning medium is analyzed quantitatively. The questionnaire method is being used to conduct this investigation. Likert scale of measurement.

RESEARCH RESULT

The outcomes of the interactive media development process of the Electronic Engineering Education course on Occupational Safety and Health at FT UNM are discussed in this part. A customized 4D development model served as the foundation for the creation of this media. The four stages under consideration are the following: definition, design, development, and dissemination. The methods researchers took to create interactive learning materials for the K3 course using the Four-D paradigm are described below. The findings of the study on the created educational materials are discussed. Nine

instructional films for the Occupational Safety and Health (K3) course in Electronic Engineering Education at FT-UNM have been created based on the study that was done.

A number of auxiliary programs were used in the creation of this film, such as Adobe Animate CC 2019 for animation creation, Audacity for sound creation and editing within the program, and CorelDraw 2018 for object design creation. The nine videos in this series include a number of key subjects based on the RPS. For example, the first video covers Sub-CP-MK (anticipated final capability) and indications. It then moves on to information about environmental health and workplace safety, as well as multiple-choice tests with five digits. Workplace accidents, PPE (Personal Protective Equipment), chemicals, noise, electromagnetic radiation, severe temperatures and pressures, industrial ventilation, and ergonomics are all covered in the second and following videos. In order to identify the factual conditions and identify the fundamental issues encountered in the K3 learning process, the research stage starts with an initial-final needs analysis. This type of research is known as Research and Development (R&D) and is conducted using the 4-D usage model (Define, Design, Development, Disseminate). After that, analyze the students to determine their features. A concept analysis seeks to define, describe, and gather the primary materials that the students will study. A task analysis is done in order to create learning objectives that students need to meet.

Creating a design as a follow-up to what was achieved in the following step involves gathering resources, compiling research instruments, and carrying out the overall design (flowchart, storyboard, and user interface to determine the flow of the video generated). The next step is creating learning films, which involves assessing them using a number of procedures, including media trials, expert validation, and revision, to ensure that they are legitimate. The product's viability is tested at this point. To ascertain the viability of the instrument that will be utilized for validation and product testing, instrument validation is done first. According to the described research findings, instrument validation yielded a 93% outcome, and the evaluation criteria were very practicable.

Table 1. Recapitulation of Material Expert Assessment Results

No	Aspect	Total Score	%	Information
1	Relevance of Material	20,5	93,5	Very worthy
2	Organizing Material	24,5	90,5	Very worthy
3	Evaluation/practice questions	15,5	91,4	Very worthy
4	Language	8	92,5	Very worthy
5	Effects on Learning Strategies	20,5	93	Very worthy
Total scores obtained			90	
Expected score amount			92	
Presentation			93%	
Category			Very worthy	

The learning film that was produced falls into the extremely feasible category, according to the findings of the evaluation conducted by media specialists. Both the video benefits and the video display features are evaluated. The value derived from the video display aspect suggests that the video's display is highly captivating. Two media specialists conducted the validation procedure, and based on the results of the 16-question test, the K3 learning video's overall performance was deemed very practicable for usage. The score category's interpretation. 94% of the instrument sheet's validation results in the media quality category fell into the "very feasible" range for use as a teaching tool in the K3 course. The learning materials that have been created can be utilized in the following phase, which is product trials, because they fall within the extremely viable category.

Table 2. Recapitulation of Media Expert Assessment Results

No	Aspect	Total Score	%	Information
1	Appearance	50	96,5	Very worthy
2	Learning	41	94,5	Very worthy
Total scores obtained			91	
Expected score amount			92	
Presentation			94%	
Category			Very worthy	

Students that used learning media participated in the product development trial. Students who had taken the K3 course were given media and questionnaires as part of this trial in order to gather information on the product's quality based on user satisfaction. All users reported that the learning video had an attractive appearance, the language used made learning easier, students could learn independently, and the video included evaluation, according to the results of the assessment conducted by students in Electronic Engineering Education at FT-UNM. Students that used learning media participated in the product development trial. Students who had taken the K3 course were given media and questionnaires as part of this trial in order to gather information on the product's quality based on user satisfaction. All users reported that the learning video had an attractive appearance, the language used made learning easier, students could learn independently, and the video included evaluation, according to the results of the assessment conducted by students in Electronic Engineering Education at FT-UNM.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions can be drawn from the research and discussion on the creation of learning videos for the K3 course in electronic engineering education at FTUNM: 1. Learning videos are developed using the research and development method (Research and development) and the 4D (Four-D) development model. Learning video products on occupational safety and health (K3) in the occupational safety and health course of the FT-UNM mechatronics vocational education study program are the outcome of the creation in this study, 3). Students' response as learning video media users was 95% with a very good

category, while the findings of the study on the feasibility of learning videos conducted by material experts obtained a feasibility level of 93% with a very feasible category and media experts obtained a feasibility level of 94% with a very feasible category.

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