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Development of Video-Based Learning Media Using the ADDIE Model to Enhance Students' Understanding of OHS: A Study at Universitas Pendidikan Indonesia

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ABSTRACT

This study focuses on the development of a video-based learning media designed using the ADDIE model to enhance students' awareness and understanding of occupational health and safety (OHS). The ADDIE model consists of five stages: Analysis, Design, Development, Implementation, and Evaluation all of which were carried out in this research. The needs analysis phase involved interviews with the head of the Multimedia Education program and the head of the laboratory, as well as a literature review. During the design phase, the concept, script, and storyboard were developed. The development phase included both production and post-production processes. In the implementation phase, the video was distributed to multimedia education students. The evaluation phase assessed the feasibility and effectiveness of the video-based learning media by distributing questionnaires to students. The evaluation results indicated that the video-based learning media are highly feasible, achieving a score of 85,7%, and effectively improves students' awareness and understanding of OHS in computer laboratories. The developed media also holds potential for implementation in other technical or vocational education environments where safety awareness is essential for the protection of individuals, the environment, and equipment.

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1. INTRODUCTION

Occupational Health and Safety (OHS) is a fundamental element that must be understood and implemented in various work environments, including educational settings, especially in computer laboratories. According to Government Regulation No. 50 of 2012, OHS refers to all activities aimed at ensuring and protecting the safety and health of workers through efforts to prevent workplace accidents and occupational diseases. Rosento et al. (2021) defines OHS as efforts or activities to create a safe working environment and prevent all forms of potential accidents. This implies that OHS involve actions taken to maintain a safe working atmosphere or condition, both for individuals and for equipment.

The implementation of OHS principles becomes particularly important in computer laboratories, where activities often involve high-risk operations such as intensive use of electronic devices, management of power cables, handling sharp tools like cutters, or working in non-ergonomic positions for extended periods. Without adequate understanding, these conditions may result in hazards such as electrical short circuits, physical injuries, visual strain, or even musculoskeletal disorders. OHS not only protects individuals but also ensures the longevity of equipment function, smooth learning processes, and fosters a disciplined and responsible work culture (Pandey, 2024).

In the context of higher education, particularly for students in the Multimedia Education program, activities often require the intensive use of technology such as computers, audiovisual devices, and other supporting equipment. If these tools are used without sufficient knowledge of proper handling and safety, they can pose significant risks to both personal safety and the durability of the equipment. Although OHS material is generally included in the curriculum, theoretical delivery alone may not be effective in developing practical awareness and understanding among students when facing risks in the computer laboratory. Without sufficient understanding of OHS, such activities can endanger both the individual and the reliability of the equipment used (Uyun and Widowati, 2022).

Therefore, there is a need for contextual, engaging, and easy-to-understand learning media. Various types of learning media can be selected and tailored to meet educational needs. As science and technology continue to advance, learning media must also evolve to create learning experiences that are relevant to current developments (Naimah A, 2022). Learning media play a crucial role in supporting contextual and applicable understanding of OHS concepts. With technological advancements, video has become one of the most widely used learning media due to its ability to deliver visual and auditory information simultaneously.

Videos have several advantages as effective learning media, especially in contexts that require visualization or simulation. One of the main strengths of video is its ability to explain abstract concepts through moving images, text, narration, and sound. This makes content easier for students to understand and remember. Videos provide a more concrete and communicative learning experience because students are not only reading or listening but also seeing real situations or processes in visual form (Barrios et al., 2022). Moreover, videos can enhance learning motivation. Engaging content both visually and aurally can sustain students' attention longer than traditional lectures (Riyanto, A. & Yunani, 2020). The use of video in learning has been shown to increase student engagement because they feel more interested and willing to follow the material through to the end (Zakaria Z, 2023).

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However, video as a learning medium also has certain limitations. One of the drawbacks is the lack of interactivity. Videos are generally one-directional, which means students act as passive recipients of information without the opportunity to ask questions or interact with the material (Lange & Costley, 2020). Producing videos also requires a significant amount of time and resources. Compared to print materials or simple presentations, video production involves scripting, filming, editing, and content validation before it can be used effectively. Additionally, without regular updates, video content can become outdated, especially in fields that rapidly evolve.

Several recent studies have demonstrated the effectiveness of video media in increasing OHS understanding and awareness in educational contexts. Aisyah & Jannah (2023) utilized TPACK-based animated videos to improve students' motivation to learn OHS material, reporting positive outcomes, particularly among visual-spatial learners. Retyana Wahrini (2024) developed a 4D-model-based OHS instructional video for electrical engineering education, achieving a feasibility rating of 93–95%. At the school level, Sari & Soegiarto (2023) systematically designed a safety briefing video for laboratory environments in vocational schools using the MAVIB approach. Additionally, Chabiba & Fasya (2023) created an interactive OHS training video integrated with a barcode system, significantly enhancing participants' understanding.

Nevertheless, most of these studies focus on general fields such as electrical engineering, language learning, or vocational education. Few have specifically addressed OHS instructional media tailored to multimedia laboratory environments, which possess distinct risk characteristics. Thus, a clear research gap exists in the development of contextually relevant video-based OHS learning tools for multimedia education students.

This study aims to design and develop a contextual and practical OHS instructional video using the ADDIE model for Multimedia Education students. Furthermore, it seeks to evaluate the feasibility of the developed media in improving students' practical understanding of OHS principles. The outcomes of this study are expected to contribute to the development of video-based learning media that support contextual learning and promote a culture of safety in technology-based academic environments, particularly within computer laboratories.

This paper is organized as follows: Section 2 outlines the methodology used in developing the video-based learning media. Section 3 presents the results and discussion regarding its feasibility and effectiveness. Finally, Section 4 provides conclusions and recommendations for future development.

2. METHODS

In this study, the ADDIE model was used to design an instructional video on occupational health and safety (OHS) to enhance students' understanding of OHS practices. The ADDIE model was developed by Dick and Carey (1996). As reflected in its acronym, the model consists of five stages: (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation.

Two techniques were used for expert validation analysis and product testing: (1) Qualitative descriptive analysis, which was used to process data from media and content experts in the form of suggestions and feedback; (2) Quantitative analysis, which involved processing data from product trials conducted with multimedia education students.

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3. RESULTS AND DISCUSSION

The instructional video on occupational health and safety (OHS) guidelines was designed using the ADDIE model, which consists of several phases. The Phases of this study can be seen in Figure 1.

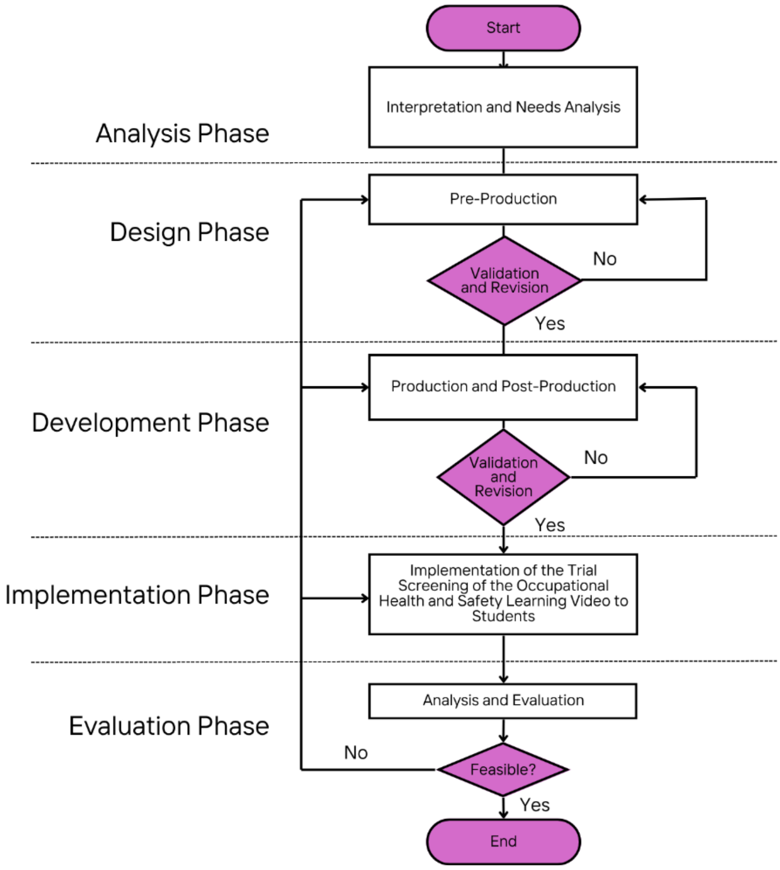

Figure 1. Research Flowchart

3.1. Analysis Phase

At this phase, the researcher conducted a preliminary study in the form of a literature review and interviews with the head of the Multimedia Education study program regarding occupational health and safety practices. It was found that occupational health and safety is considered important because the Multimedia Education study program frequently uses laboratories in its learning activities, including computer labs, game labs, and photography labs, which involve direct interaction with electronic and electrical-powered devices. However, in practice, students have not yet applied occupational health and safety (OHS) measures during their learning activities in the laboratory. This raises concerns among all parties, including the head of the study program and lecturers, as it is considered unsafe both for the students' health and safety, as well as for the security of the electronic equipment in the laboratories.

Based on the results of the literature study, the researcher found that video-based learning media can be used as an instructional tool to enhance students' awareness and understanding of occupational health and safety. Referring to the findings of Firda et al. (2022), it was stated that the development product for learning media in the English subject, especially Food and Drink material, using video with the ADDIE model at SDK Karitas III Surabaya is considered feasible to be used and applied in the learning process as a guide for using learning media. Therefore, the researcher decided to use video-based learning media to improve students' awareness and understanding of occupational health and safety.

3.2. Design Phase

The design phase is the stage where the researcher collaborates with the video production team to determine the concept, content, script, and storyboard. This phase aims to ensure that the video delivers its message in a more systematic way, thereby optimizing the communication of its intended meaning.


Naskah Video Edukasi: Keselamatan dan Kesehatan Kerja (K3) di Lab Komputer Prodi Pendidikan Multimedia

[OPENING]

(Visual logo Prodi Pendidikan Multimedia & Lab Komputer)

Narator :

"Selamat datang! Dalam video ini, kita akan membahas tentang Prodi Pendidikan Multimedia serta prosedur K3 di Lab Komputer."

(Visual: Lab Komputer, narasumber berdiri di depan.)

Segment 1: Pengenalan Prodi & Lab

Narator :

"Prodi Pendidikan Multimedia berfokus pada pengembangan keterampilan teknologi multimedia. Lab Komputer menjadi tempat praktik utama mahasiswa."

(Visual: Klip mahasiswa di Lab)

Segment 2: Peraturan Lab (SOP)

Narator :

"Agar aman, kita harus mengikuti SOP yang berlaku di Lab ini. Peraturan ini meliputi disiplin, kebersihan, dan keselamatan."

(Visual: Tulisan SOP di layar.)

Figure 2. OHS Video Script

Developing content into a video script means transforming the instructional material into written form that serves as a guide to produce educational videos. A script plays a vital role as the main reference in the creation of a video program. The scriptwriting process begins with identifying the main idea. In the context of instructional development, this idea or topic is first formulated into specific learning objectives. Afterward, the idea is written into a video script, which is then produced into an audiovisual learning presentation (Castillo et al., 2021). The next stage is the creation of a storyboard to visualize and organize the narrative, as well as to facilitate a more efficient arrangement of the storyline and production process.

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Figure 3. OHS Video Storyboard

A storyboard functions as a detailed guide that outlines each sequence in a program. In addition, it serves as a reference for voice-over artists and sound technicians during the recording process to ensure alignment with the script. The storyboard also acts as a written document that supports the creation of a manual book, which serves as a user guide for the program. With a storyboard, the production process becomes more structured, as the entire content of the program follows the flow and information that has been designed in the storyboard (Samsinar, 2021).

At this stage, design validation including the script and storyboard was also conducted with validators. However, there were no revisions suggested during this phase, so the researcher proceeded to the next stage.

3.3. Development Phase

The development phase consists of the production and post-production phases. The production phase includes the recording of video and audio for each scene. The video was recorded in two different settings: the photography laboratory and the computer laboratory. The production process was carried out over two days and involved three main talents.

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Figure 4. Production process

After the production process, each visual and audio asset was stored in Google Drive to minimize the risk of asset loss.

Since the video does not only consist of audio recorded directly during filming, but also includes visuals that require voice-over narration, voice-over recordings were conducted separately at a different time and location. The voice-over assets were also stored in an organized manner in the same Google Drive folder along with the other production assets.

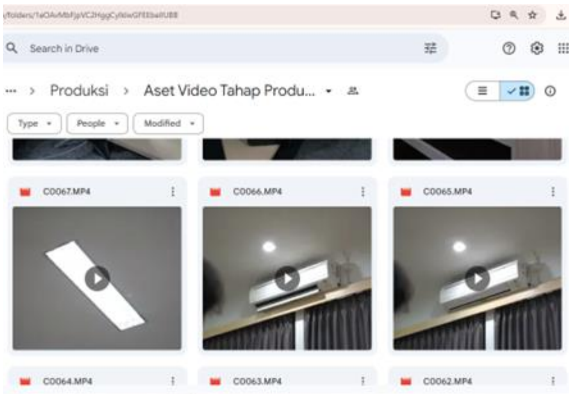

Figure 5. Videos Production assets

After all assets were completed, the process moved into the post-production stage. The post-production stage consists of video editing and rendering processes. Video editing and rendering involve combining video assets, in the form of clips recorded during the production phase, into a complete and coherent video.

The video editing and rendering were done using CapCut software. CapCut is a free and easily accessible video editing software, which is also user-friendly. The editing process includes combining video clips with audio, whether the audio was recorded

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simultaneously with the video clips or added later as voice-over. Subtitles, logos, and other visual elements were also added. To create a more engaging atmosphere, background music was included, ensuring that it does not interfere with the delivery of the occupational health and safety (OHS) material.

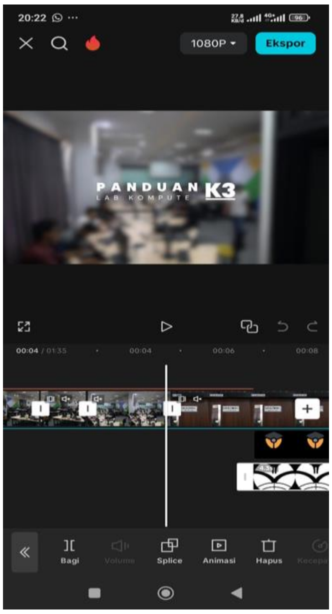

Figure 6. Editing Process using Capcut

In this phase, the researcher conducted validation with the head of the study program and the head of the laboratory. The method used was qualitative descriptive analysis. The researcher presented the video to the validators, who then provided comments, suggestions, and feedback directly on the video. There were revisions suggested by the validators, including changing the color of the OHS text from white to yellow, as yellow symbolizes caution. Additionally, the placement of the logo needed to be adjusted. The researcher immediately implemented the revisions and reconfirmed them with the validators.

3.4. Implementation Phase

The next phase is the implementation phase. In this phase, the revised video was distributed to the students. A total of 29 students from the Multimedia Education Program participated in the study, selected through convenience sampling due to their accessibility and voluntary participation. All participants were enrolled in the Multimedia Computer Networking course. The instructional video was distributed before the practicum session as part of the lecture activities. The selected participants have relevant experience with computer laboratory activities, making their feedback valuable for evaluating the media's practicality and clarity. After watching the video, the students were instructed to fill out a questionnaire prepared via Google Forms to assess the feasibility of the OHS (Occupational Health and Safety) instructional video that had been produced and validated.

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3.5. Evaluation Phase

In the evaluation phase, the researcher conducted a feasibility test of the OHS guide video by instructing students to fill out a questionnaire after watching the video. The questionnaire was given to 29 multimedia education students. The questionnaire consisted of 17 questions with the following indicators: (1) content feasibility aspect with 4 questions; (2) presentation aspect with 3 questions; (3) language aspect with 2 questions; (4) visual and audio aspect with 4 questions; and (5) benefit aspect with 4 questions. The calculation of the questionnaire results and Feasibility category based on criteria was adapted from Ernawati & Sukardiyono (2017), which is:

$$Result = \frac{Total\ score\ obltained}{Maximum\ score} \times 100\%$$

Table 1. Feasibility category based on criteria.

No	Score (%)	Feasibility Criteria
1	< 21	Very Low
2	21-40	Low
3	41-60	Medium
4	61-80	High
5	81-100	Very High

Before calculating the feasibility percentage using the formula, the researcher first calculated the obtained score and the maximum score. The obtained score is the total sum of all respondent answers to every statement in the questionnaire. This score reflects the actual evaluation from the respondents regarding the developed video media. In this study, the researcher obtained a score of 1689. Meanwhile, the maximum score can be calculated using the following formula:

$$Maximum\ Score = Respondents \times Questions \times Highest\ Score$$

Thus, the researcher obtained a maximum score of 1972. After collecting these values, they were then used in the calculation to determine the feasibility level of the developed video media.

$$Result = \frac{1689}{1972} \times 100\% \ = 85{,}649\%$$

The results of the feasibility test through the questionnaire showed an average score of 85.649% from all respondents and all questions. Based on Table 1, these results indicate that the developed K3 guide video is very highly feasible to be used as a video-based learning media to enhance awareness and understanding of occupational health and safety.

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Furthermore, the developed video-based learning media has the potential to be applied in other technical and vocational education institutions beyond the Multimedia Education Program. Since occupational health and safety (OHS) principles are universally relevant wherever electronic equipment and laboratory activities are involved, this media can be adapted to different educational environments. Adjustments may be necessary to accommodate local cultural norms, institutional regulations, or language variations, but the core instructional value remains applicable. This indicates that the instructional video can serve as a flexible and scalable educational tool to promote safety awareness in diverse educational and cultural contexts.

4. CONCLUSION

The video-based learning media was designed using the ADDIE model to enhance awareness and understanding. The ADDIE stages consist of Analysis, Design, Development, Implementation, and Evaluation all of which have been carried out in this study.

The analysis stage involved conducting interviews with the head of the Multimedia Education study program and the head of the laboratory, as well as performing a literature review to determine learning needs. The design stage focused on defining the concept and developing the script and storyboard. The development stage included the production and post-production processes. The implementation stage involved distributing the video to Multimedia Education students. Finally, the evaluation stage assessed the feasibility of the video-based learning media.

The evaluation process analyzed the results of the video screening trial by distributing questionnaires to Multimedia Education students. The findings revealed that the video-based learning media is highly feasible for improving awareness and understanding of occupational health and safety in the computer laboratory, with a final score of 85.649%.

For future research, it is recommended to examine the long-term impact of using video-based media on students' safety behavior in laboratory environments. Further studies could also explore the integration of interactive elements such as quizzes or feedback forms within the video to enhance engagement and knowledge retention. In addition, adapting similar media for other technical disciplines could broaden its applicability and benefits.

AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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