

Audio Visual Material for Safety Briefing Learning for Students in School Laboratories

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ARTICLE INFO

Keywords:

Audio-Visual;
Learning;
Laboratory;
Safety-Briefing
Video

Article history:

Received 2024-04-28

Revised 2024-06-20

Accepted 2024-06-25

ABSTRACT

This study aims to explore the perceptions of students and teachers regarding the effectiveness of audio-visual teaching materials in enhancing the understanding of occupational health and safety in school laboratories. The study employs a qualitative approach, utilizing descriptive methods to gather and analyze data. The research was carried out at Al-Ittihad Cianjur Vocational School, a technical and vocational education institution. The informants for this research were the Head of the Laboratory Program, the Person in Charge of the Laboratory, the School Principal, 7 teachers who taught in the laboratory, and 100 students. Data were collected through various techniques, including observations, document analysis, interviews, and focus group discussions (FGDs). To determine the level of reliability or trustworthiness of data, this research uses credibility, transferability, dependability, and confirmability. The data analysis technique uses qualitative data which includes stages of data reduction, data presentation, and conclusion. The research results concluded that the provision of audio-visual teaching materials in the form of videos was very good and had a positive impact on learning. The students have quite good attitudes when carrying out learning activities, especially regarding their work safety in the laboratory. These findings also provide awareness about the importance of increasing digital competence so that teachers can be more creative and innovative in creating learning resources.

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1. INTRODUCTION

Digital technology has developed rapidly and has become a medium of communication in social life. Indonesian people have used the internet network as a communication medium to access information, and in the teaching and learning process, they have used digital technology as an authentic learning resource. Moreover, today's students have become native to the use of technology. Because today's students' lives are filled with digital media while their brains are still developing, many popular media writers claim that this generation of students thinks and learns differently than previous generations (Thompson, 2013). Thus, it can be said that students are very familiar with the development

of digital technology and it has become a part of people's lives. Even the use of digital technology also influences educational activities. Although its use still faces various challenges.

The results of the analysis of observation data at Al-Ittihad Cianjur Vocational School found several interesting phenomena that became problems for teachers. Some of the focus problems of this research are 1) the need for teaching materials in the form of audio-visuals has not been met, 2) students find it difficult to understand the teaching materials for Safety Briefing content because there are no visual images in the form of videos, 3) the level of students' understanding of practical safety briefing material in the laboratory is low, and 4) the use of technological devices in schools has not been utilized optimally in schools as learning resources. Meanwhile, the results of interviews with laboratory teachers and classroom teachers showed that there was an agreement that they needed teaching materials in the form of videos that taught safety briefings that contained work safety or learning in school laboratories. So this is a solution to the problems faced so far. Moreover, schools, teachers and students have technological devices that can support the use of teaching materials in the form of videos. This situation is an interesting phenomenon to be researched and developed so that students at secondary level schools can increase their capacity to access learning resources that are not only focused on the classroom but also that they can access learning resources via their smartphones or computers. Moreover, after the onset of COVID-19, it shows that 100% of students have smartphones which are used as learning tools.

Previous studies found that the provision of teaching materials has now been influenced by the use of information and communication technology (Lase, 2019). Thus, it can be said that the provision of teaching materials has experienced a quite drastic shift from print media to audiovisual media such as video. It means that information technology provides rapid changes in the world of work, classrooms and educational needs, which have shifted from a focus on static skills to the ability to learn in a dynamic environment (Stuchlikova, 2016). Visual aids provide efficiency and a positive impact on students in carrying out practical work at school (Saleh, 2011). Another study has created a digital laboratory safety training platform called AALTOLAB that consists of a web-based interactive 360° virtual laboratory, integrated with a Moodle-based digital exam with automated scoring. Thus, providing these resources facilitates deep learning and student engagement, thereby improving the safety culture in the laboratory (Viitaharju et al., 2021). So, learning resources in the form of audiovisuals (videos) can empower students to reflect on their learning (Schneider et al., 2014). Practical learning in a studio or laboratory does have different challenges when using online learning platforms (Annum & Annum, 2023). However, learning in the laboratory using videos provides a different experience for students (Croker et al., 2010). In other words, audiovisual teaching materials provide increased student academic achievement (Ibe & Abamuche, 2019a; Omariba, 2022; Quarcoo-Nelson et al., 2012; Tairu Idris, 2018).

Therefore, it can be said that audio visuals can be used as a medium to provide learning resources or teaching materials. Therefore, this research wants to present a novelty that is different from previous research as a research gap, namely the use of teaching materials in the form of videos for learning about safety briefings related to achieving learning objectives about occupational health and safety when students study in the laboratory. This audio-visual teaching material is designed according to school laboratory situations so that it can be used as real practice material for learning activities at school. These teaching materials in the form of videos can be accessed generally on the YouTube platform so students can access them anywhere. Then, to sharpen the design of this research which is different from other research, the research focuses on assessing the feasibility of using audio-visual teaching materials for learning safety briefings through the perceptions of students and teachers.

So, this research aims to obtain student and teacher perceptions about audio-visual teaching materials for learning safety briefings in school laboratories so that students understand the concept of occupational health and safety. It is hoped that the results of this research can contribute to the development of teaching materials that utilize digital technology so that students can access learning resources anywhere and at any time. Moreover, the era of globalization with technological advances

has become an inseparable part of the civilization of society's social life. So, the use of learning resources in the form of videos is very appropriate for the needs of the current teaching and learning process

2. METHODS

This research was conducted at Al-Ittihad Vocational School, Cianjur. The research was carried out for 10 months from July 2023 to April 2024. This research used qualitative descriptive methods. This research was conducted to examine phenomena that occur in the field and explain existing problem-solving based on data, so in this research, there is a process of presenting data, analyzing and interpreting and also comparative and correlative (J. W. Creswell & Creswell, 2018). The descriptive qualitative approach was used because the study focused on exploring the perceptions of students and teachers regarding the effectiveness of audio-visual teaching materials in enhancing the understanding of occupational health and safety in school laboratories. Thus, the technique for determining the research sample uses a purposive technique. The informants for this research were the Head of the Laboratory Program, the Person in Charge of the Laboratory, the School Principal, 7 teachers who taught in the laboratory and 100 students. Data collection techniques are;

1. Observations were carried out to explore problems related to the problems faced by teachers in the laboratory regarding teaching materials for learning safety briefings. Observation activities were carried out during preliminary research and implementation of the use of audio-visual teaching materials in the form of videos in the laboratory. Observation activities are carried out through the process of observing learning activities in the laboratory on students in understanding occupational health and safety teaching materials in school laboratories and observing the availability of teaching materials so far on the level of students' understanding in understanding teaching materials.
2. Documents are taken from teaching materials that have been used by teachers in the laboratory. So, researchers analyzed the use of teaching materials such as books, modules or worksheets used by teachers so far.
3. Interviews were used to obtain the perceptions of students and teachers regarding the use of audio-visual teaching materials in the form of videos for learning safety briefings. The interview questions given are structured. Questions have been prepared with answer choices. Interviews were conducted directly at the school with the informant. The use of structured questions is done to avoid answering questions that are not to the needs of the research focus. The list of interview questions is;

Table 1. Interview Questions for Students and Teachers

Code	Questions	Yes	No
Q1	Do you think audio-visual teaching materials for learning safety briefings have interesting features?		
Q2	Do you think audio-visual teaching materials for learning safety briefings have clear and high-resolution images?		
Q3	Do you think audio-visual teaching materials for learning safety briefings have clear sound quality?		
Q4	Do you think that involving the school community in audio-visual teaching materials for learning safety briefings is very good and can increase student participation in learning?		
Q5	Do you think audio-visual teaching materials for learning safety briefings have good lighting?		

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- Q6 Do you think audio-visual teaching materials for learning safety briefings have good image objects from every corner of the laboratory room and school environment?
- Q7 Do you think audio-visual teaching materials for learning safety briefings help increase motivation to learn in the laboratory?
- Q8 Do you think that audio-visual teaching materials for learning safety briefings in the form of real videos of school laboratory environments make it easier for you to understand occupational health and safety material?
- Q9 Do you think that audio-visual teaching materials for learning safety briefings have complete material content, especially regarding occupational health and safety material?
- Q10 Do you think audio-visual teaching materials for learning safety briefings are the right learning resource at this time?
- Q11 Do you think audio-visual teaching materials for learning safety briefings are better accessible to the general public?
- Q12 Do you think audio-visual teaching materials for learning safety briefings can improve your academic achievement?
- Q13 Do you think audio-visual teaching materials for learning safety briefings have an impact on your performance results in the laboratory, especially related to work safety (learning)?
- Q14 Do you think audio-visual teaching materials for learning safety briefings have clear learning instructions and language?
- Q15 Do you think audio-visual teaching materials for learning safety briefings have sufficient time duration to teach work safety material?
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4. FGDs were conducted by researchers with informants to discuss findings regarding the suitability of audiovisual teaching materials for learning safety briefings.

To determine the level of reliability or trustworthiness of the data, this research uses several steps as described by Lincoln and Guba, namely credibility, transferability, dependability and confirmability (J. Creswell & Clark, 2018; J. W. Creswell, 2012). Data analysis techniques using qualitative data, including stages of data reduction, data presentation, and conclusion (Miles et al., 2014). Data reduction carried out in this research is the process of selecting research sites that have problems, focusing on research problems, simplifying the research roadmap and research steps, and transforming data into written transcripts. The data presentation process is carried out through the simplification stage of research data according to data categories and analyzed to answer research problems. Data is presented in the form of percentages and average values, followed by a description of the data in narrative form. The final step is drawing conclusions based on the analytical data that has been produced.

3. FINDINGS AND DISCUSSION

The results of interview data analysis are presented through percentages and average scores obtained from students and teachers, as in the table below;

Table 2. Percentage and Average of Students' Perception of Audio Visual Material for Safety Briefing Learning

Code	Questions	Yes		No	
		Average	%	Average	%
Q1	Do you think audio-visual teaching materials for learning safety briefings have interesting features?	0.8	80	0.2	20
Q2	Do you think audio-visual teaching materials for learning safety briefings have clear and high-resolution images?	0.67	67	0.33	33
Q3	Do you think audio-visual teaching materials for learning safety briefings have clear sound quality?	0.9	90	0.1	10
Q4	Do you think that involving the school community in audio-visual teaching materials for learning safety briefings is very good and can increase student participation in learning?	0.87	87	0.13	13
Q5	Do you think audio-visual teaching materials for learning safety briefings have good lighting?	0.9	90	0.1	10
Q6	Do you think audio-visual teaching materials for learning safety briefings have good image objects from every corner of the laboratory room and school environment?	0.85	85	0.15	15
Q7	Do you think audio-visual teaching materials for learning safety briefings help increase motivation to learn in the laboratory?	0.95	90	0.05	5
Q8	Do you think that audio-visual teaching materials for learning safety briefings in the form of real videos of school laboratory environments make it easier for you to understand occupational health and safety material?	0.95	90	0.05	5
Q9	Do you think that audio-visual teaching materials for learning safety briefings have complete material content, especially regarding occupational health and safety material?	0.8	80	0.2	20
Q10	Do you think audio-visual teaching materials for learning safety briefings are the right learning resource at this time?	0.95	90	0.05	5
Q11	Do you think audio-visual teaching materials for learning safety briefings are better accessible to the general public?	0.85	85	0.15	15
Q12	Do you think audio-visual teaching materials for learning safety briefings can improve your academic achievement?	0.77	77	0.23	23
Q13	Do you think audio-visual teaching materials for learning safety briefings have an impact on your performance results in the laboratory, especially related to work safety (learning)?	0.9	90	0.1	10
Q14	Do you think audio-visual teaching materials for learning safety briefings have clear learning instructions and language?	0.9	90	0.1	10
Q15	Do you think audio-visual teaching materials for learning safety briefings have sufficient time duration to teach work safety material?	0.86	86	0.14	14

The data in Table 2 show that a significant majority of students (90% or higher) find the audiovisual materials to be engaging, with clear images and sound quality, which underscores the effectiveness of these materials in enhancing understanding and motivation. Overall, from a student

perspective, it is concluded that audio-visual teaching materials in the form of videos for learning safety briefings have had a positive impact on the level of understanding of material about occupational health and safety. However, what needs to be paid attention to is that the video feature must be made more interesting, and how to use video resources for students so that they can provide better performance in increasing student achievement because there are still 23 students whose academic development, especially in the concept of material understanding of health and work safety is not optimal. So, the role of audio-visual materials in teaching can lead to increased student motivation and achievement (Asadi, 2015).

Table 3. Percentage and Average of Teachers' Perception of Audio Visual Material for Safety Briefing Learning

Code	Questions	Yes		No	
		Average	%	Average	%
Q1	Do you think audio-visual teaching materials for learning safety briefings have interesting features?	0.1	100	0	0
Q2	Do you think audio-visual teaching materials for learning safety briefings have clear and high-resolution images?	0.7	70	0.3	30
Q3	Do you think audio-visual teaching materials for learning safety briefings have clear sound quality?	0.7	70	0.3	30
Q4	Do you think that involving the school community in audio-visual teaching materials for learning safety briefings is very good and can increase student participation in learning?	0.8	80	0.2	20
Q5	Do you think audio-visual teaching materials for learning safety briefings have good lighting?	0.6	60	0.4	40
Q6	Do you think audio-visual teaching materials for learning safety briefings have good image objects from every corner of the laboratory room and school environment?	0.9	90	0.1	10
Q7	Do you think audio-visual teaching materials for learning safety briefings help increase motivation to learn in the laboratory?	0.1	100	0	0
Q8	Do you think that audio-visual teaching materials for learning safety briefings in the form of real videos of school laboratory environments make it easier for you to understand occupational health and safety material?	0.1	100	0	0
Q9	Do you think that audio-visual teaching materials for learning safety briefings have complete material content, especially regarding occupational health and safety material?	0.1	100	0	0
Q10	Do you think audio-visual teaching materials for learning safety briefings are the right learning resource at this time?	0.1	100	0	0
Q11	Do you think audio-visual teaching materials for learning safety briefings are better accessible to the general public?	0.1	100	0	0
Q12	Do you think audio-visual teaching materials for learning safety briefings can improve students' academic achievement?	0.7	70	0.3	30
Q13	Do you think audio-visual teaching materials for learning safety briefings have an impact on your performance results in the laboratory, especially related to work safety (learning)?	0.9	90	0.1	10

Q14	Do you think audio-visual teaching materials for learning safety briefings have clear learning instructions and language?	0.9	90	0.1	10
Q15	Do you think audio-visual teaching materials for learning safety briefings have sufficient time duration to teach work safety material?	0.1	100	0	0

The results of the analysis of perception data from teachers, school principals, heads of laboratory programs and those in charge of laboratories concluded that the provision of audio-visual teaching materials in the form of videos was very good and had a positive impact on learning. However, features related to video quality must be improved and have a high level of quality so that the video results presented also have clear images, sounds or displays. Thus, the use of audio-visual learning resources in the learning process becomes a new challenge for teachers (Akhmetshin et al., 2019). Audiovisual aids are the best tools to make teaching effective and the best dissemination of knowledge (Rasul et al., 2011).

The results of observation data analysis of the application of audio-visual (video) teaching materials for safety briefing learning have also provided an illustration of changes in learning in school laboratories. Students have quite good attitudes in carrying out learning activities, especially regarding work safety in the laboratory. Even students who have been involved in making videos share their experiences with other students in implementing occupational health and safety in the laboratory. Observation data on the learning process in the laboratory strengthens students' positive responses to the use of audiovisual teaching materials in the form of videos. Students better understand the teaching materials for implementing occupational safety and health in the laboratory. Thus, it can be said that audiovisual teaching materials not only increase theoretical understanding of concepts but also increase students' motivation to pay attention to work safety or study in the laboratory. So, students are already aware of the importance of occupational health and safety material for learning activities in class.

The findings from observations are also in line with the results of discussions with colleagues (teachers who teach in the laboratory) that audio-visual teaching materials in video form provide a very significant positive impact on learning outcomes in the laboratory, changes in students' level of awareness about the importance of paying attention to personal safety in the school laboratory, and the level of learning motivation to create an academic atmosphere that is very conducive to learning. Apart from that, students' knowledge of the content of occupational safety and health material has increased quite significantly, as can be seen from their practical application in the laboratory. Students can also study audiovisual teaching materials more fun and at any time because they can access them via smartphone. Apart from that, this video teaching material is also published on YouTube with the link; <https://www.youtube.com/watch?v=z6RHbWBguFo>, thereby providing many benefits to the general public regarding the importance of understanding occupational health and safety concepts in school laboratories.

Thus, the results of this research have huge implications for the development of teaching materials as learning resources for achieving learning goals. Teachers have different motivations for innovating in providing teaching materials, especially as developments in science and technology require educators to develop teaching materials creatively (Farani & Winarni, 2018). These findings also provide awareness about the importance of increasing digital competence so that teachers can be more creative and innovative in creating learning resources. This is in line with the understanding of the existence of digital technology which has provided changes to the concept of learning (Alaboudi & Alharbi, 2021; Almås et al., 2021; Amankwah-Amoah et al., 2021). Apart from that, schools also get a new perspective on the need to provide teachers with digital competence, provide infrastructure that can meet teachers' needs for developing digital resources and the quality of education delivery (Kim et al., 2021).

Moreover, up to now, many teachers at schools and universities rarely make their videos (Santos Espino et al., 2020). So, the involvement of teachers in making audio-visual (video) teaching materials for learning safety briefings has had a huge impact on changing mindsets about digital learning. Teachers must follow development trends by studying and using new technology (Audio-visual) in delivering learning (Abdulrahman et al., 2020; Ibe & Abamuiche, 2019b). The successful application of audio-visual technology in providing teaching materials in the laboratory provides a different perspective on digital technology innovation in teaching because students' positive views are also very significant towards the use of audio-visual technology (Owusu, 2020; Shafira & Rosita, 2022). Moreover, the nuances of learning in the classroom and laboratory are different (Croker et al., 2010). The laboratory as a student practice space requires students to have an awareness of different ways of learning than in the classroom. They must be able to understand work safety procedures while studying. The role of laboratories is very large for Vocational High School Al-Ittihad because the skills competencies that students must have are 3 skill competencies, namely Software and Game Development, Laboratory Test Analysis, and Office Management Automation. Thus, understanding occupational health and safety material is an orientation that must be considered by all parties who use the laboratory. This research provides a different and enjoyable way for students and all parties involved in carrying out learning activities in the laboratory.

4. CONCLUSION

The results of the data analysis concluded that the provision of audio-visual teaching materials significantly improved students' understanding of occupational health and safety in laboratory settings. Students exhibited increased awareness and adaptability to the distinct learning environment of the laboratory compared to traditional classrooms. The teachers also provide a positive view of global changes and challenges from the development of digital technology in providing teaching materials. Teachers have changed their thinking patterns towards audio-visual technology in the teaching process.

This research is still limited to assessing the suitability of audio-visual teaching materials in the form of videos in safety briefing learning classes in laboratories at vocational high schools through the perceptions of teachers and students. Therefore, this research recommends to future researchers to be able to develop a wider population or research samples and was able to reach high school schools which incidentally also have laboratories. Awareness about health and work safety is not only for vocational high school students but can also be applied to all laboratories. Schools can provide consistent training to teachers to innovate in making teaching materials using audio-visual technology

Acknowledgments: Thank you to all students, teachers, school principals, those in charge of the laboratory and the head of the laboratory program at Al-Ittihad Vocational High School who have assisted with this research from making video teaching materials to assessing feasibility. Thanks are also expressed to research colleagues for the collaboration that has been carried out until this research is completed

Conflicts of Interest: no conflict of interest

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