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Development of AI-Assisted Learning Videos For Occupational Health and Safety (OHS) In Cosmetology And Beauty Vocational Education

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Abstract: This research addresses the low effectiveness of Occupational Health and Safety (OHS) learning in Cosmetology Education, where conventional lecture-based methods fail to realistically visualize occupational hazards in salon environments. Previous studies on OHS learning media in vocational education have primarily relied on conventional instructional videos or AI applications developed for other educational contexts, with limited attention to cosmetology-specific OHS instruction. Furthermore, no previous study has integrated multiple generative AI tools into a unified workflow for developing animated OHS learning media in cosmetology education. To address this gap, the study develops AI-assisted animated videos integrating multiple AI tools including ChatGPT, Veo Gemini, DeepSeek, JoggAI, Canva, and CapCut into a single OHS instructional media, representing the first multi-tool AI video developed specifically for cosmetology OHS contexts. This study uses the Research and Development method with the ADDIE model. Data were collected through expert validation sheets and student response questionnaires analyzed using descriptive percentage techniques. Validity results show an average score of 4.6 for material and 4.2 for media, both categorized as valid, while the practicality test with 18 students yielded a score of 4.76, categorized as highly practical. This AI-assisted animated video is therefore feasible and practical as a learning innovation for OHS in beauty vocational education, contributing to improved safety competence and more engaging instructional experiences for cosmetology students.

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Introduction

Vocational education is currently undergoing a profound transformation to meet the demands of modern industry. Vocational education aims to prepare graduates with technical

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competencies and adaptive capabilities required to perform effectively in dynamic workplace environments(Idkhan et al., 2025; Muharam et al., 2025). Occupational health and safety (OHS) has emerged as one of these competencies as vocational graduates are directly exposed to hazards in the workplace immediately upon entering employment. The rising number of reported occupational accidents in Indonesia reveals the urgency of improving OHS education. The Indonesian Social Security Agency for Employment (BPJS Ketenagakerjaan) reported 462,241 occupational accidents in 2024, a significant increase compared with 221,740 cases in 2020(Kementerian Ketenagakerjaan Republik Indonesia, 2025). These statistics indicate that OHS competence should be built during vocational education rather than post-graduation.

The cosmetology and beauty industry is fraught with occupational hazards. Indonesia's beauty industry is valued at IDR 146 trillion and has over 100,400 beauty salons throughout the country(Pusat Penelitian Badan Keahlian DPR Republik Indonesia, 2025). Beauty practitioners are routinely exposed to hazardous chemicals such as formaldehyde, ammonia, disinfectants and hair treatment compounds, as well as biological, ergonomic and physical hazards(Nkoana et al., 2024). Previous studies revealed that 56.1% of salon workers had occupational skin diseases due to exposure to the workplace(Audina et al., 2017). Long term exposure to the chemicals is associated with respiratory disorders, allergies, dermatitis, and even carcinogenic risks (Nkoana et al., 2024). Laboratory practice of students of cosmetology is also subject to these occupational hazards, since they perform similar practical procedures but have less experience of hazard recognition and prevention. Based on the observations in the Cosmetology and Beauty Education Program (CBEP) of Universitas Negeri Padang (UNP), the OHS instruction still mainly uses conventional lectures and PowerPoint presentations without realistic hazard simulation. As a result, students have faced issues like skin irritation due to inadequate hygiene, infections from unsterilized equipment, injuries from scissors while practicing hair cutting, and minor electrical accidents in laboratory settings. A preliminary needs assessment also revealed that 71.5% of students felt that the existing OHS learning was boring and not engaging enough

Recent advances in educational technology have created new opportunities to improve occupational health and safety (OHS) instruction through multimedia learning Video-based learning, in particular, has been widely recognized as an effective medium for demonstrating abstract safety concepts and hazardous workplace situations that cannot always be safely

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replicated in authentic practice (Mandalika & Syahril, 2020; Yupelmi et al., 2024). Compared with conventional lectures, animated instructional videos provide dynamic visualizations that improve attention, engagement, and conceptual understanding (Putri et al., 2026). This instructional approach is supported by the Cognitive Theory of Multimedia Learning, which posits that meaningful learning occurs when learners process verbal and visual information simultaneously through separate cognitive channels, thereby reducing extraneous cognitive load and facilitating deeper knowledge construction (Mayer, 2024). Furthermore, recent advances in generative artificial intelligence (AI) have expanded the potential of multimedia learning by enabling educators to produce realistic animations, instructional graphics, digital avatars, and narration more efficiently than conventional video production methods (AlShaikh et al., 2024; Fink et al., 2024). Compared with conventional video production, AI-assisted tools enable educators to create realistic simulations of hazardous scenarios more efficiently, making them particularly suitable for occupational safety education.

Previous studies consistently demonstrate that digital learning media improve educational outcomes across various vocational fields. Specifically, in occupational health and safety (OHS) education, instructional videos have been shown to improve safety literacy, procedural understanding, and learning effectiveness in vocational contexts such as construction, fashion, and small-scale industries (Anriyana et al., 2025; Subekti et al., 2026; Wahrini & Peng, 2023). These findings indicate that video-based learning helps students visualize workplace hazards and safety procedures more effectively than traditional lecture-based instruction. Furthermore, recent advancements in artificial intelligence have expanded the capabilities of educational media. AI-assisted learning, implemented through adaptive learning systems and AI-generated animated media, has significantly improved students' learning outcomes, motivation, and engagement (Annisa et al., 2024; Dinata et al., 2025). However, these previous studies were conducted in different educational contexts and employed different technological approaches. A comparison of previous studies is presented in Table 1.

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Table 1 Comparison of Previous Studies and Research Gap

Authors	Learning Media	AI Technology	Main Findings	Research Gap	Novelty
Subekti et al. (2026)	Educational video database	None	Improvement in occupational safety literacy.	Does not use artificial intelligence; does not focus on the beauty industry.	The use of a sustainable video database for small-scale enterprises.
Wahrini and Peng (2023)	Animated interactive learning video	None	Development of video learning media using the 4D model.	Occupational safety learning is theoretical without real procedure simulations.	Animated video specifically for occupational safety in vocational school building departments.
Dinata et al. (2025)	Interactive digital module	Adaptive learning algorithm	AI-generated animated videos significantly improved learning outcomes.	Does not discuss occupational safety and is not in the field of cosmetology.	Application of adaptive algorithms in religious education materials.
Anriyana et al. (2025)	Tutorial video	None	The media is highly valid as an independent guide for sewing safety procedures.	Lecture methods failed to change safety behavior in the fashion practice room.	Occupational safety guide video specifically for the fashion production stage.
Annisa et al. (2024)	Animated video	(ChatGPT and Plotagon)	Increased learning motivation.	Does not discuss occupational safety and focuses on language skills.	Independent animated media production using two artificial intelligence tools.
This Study	Animated occupational safety	ChatGPT, DeepSeek, Gemini Veo 3,	Development and validation of occupational safety learning	The absence of an integrated smart technology	The use of various integrated smart content

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	learning video	JoggAI, Canva, and CapCut	media for cosmetology.	ecosystem specifically for occupational safety in cosmetology.	creation tools for the production of vocational videos.

Despite these positive outcomes, several crucial research gaps remain. First, prior studies regarding occupational safety education rely heavily on traditional instructional videos, bypassing the use of artificial intelligence in the media creation process. Second, existing literature that applies smart technologies tends to focus on adaptive systems or language instruction, leaving workplace safety largely unexplored. Third, none of the reviewed literature addresses safety training within cosmetology and beauty vocational education. This omission is notable given the high exposure to chemical, biological, ergonomic, and physical hazards in this sector. Finally, previous investigations fail to integrate various artificial intelligence applications into a cohesive workflow for producing validated educational videos. These limitations highlight a strong need for AI-assisted instructional media designed specifically for occupational safety in cosmetology.

Accordingly, this study aims to develop and validate an AI-assisted instructional video for occupational health and safety in cosmetology and beauty vocational education. Unlike previous studies, which typically employed only one or two AI applications or used AI for isolated instructional tasks, this study integrates multiple generative AI tools—including ChatGPT, DeepSeek, Gemini Veo 3, JoggAI, Canva, and CapCut—into a single instructional media development workflow. Each tool was employed according to its specific function, including content generation, script refinement, visual production, animation, narration, and video editing, resulting in an integrated AI-assisted learning medium for Occupational Health and Safety (OHS) education in cosmetology.

Research Method

This study employed a research and development (R&D) approach to develop an AI-assisted learning video for Occupational Health and Safety (OHS) in cosmetology and beauty vocational education. The instructional media were developed using the ADDIE instructional design model, which consists of five sequential stages: Analysis, Design, Development, Implementation, and Evaluation. The study was conducted at the Cosmetology and Beauty Education Study Program, Universitas Negeri Padang, from August to October 2025. Consistent with the objectives of this study, the research focused on establishing the initial feasibility of the developed learning media through expert validation and practicality evaluation. Within the ADDIE framework, these stages precede effectiveness evaluation because instructional effectiveness should only be examined after the developed media have been confirmed to be valid and practical. Therefore, the effectiveness phase, which will investigate students' Occupational Health and Safety (OHS) knowledge, risk perception, and

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safety motivation using a pre-test–post-test quasi-experimental design, will be conducted in a subsequent study and reported separately.

The research procedure followed the five stages of the ADDIE instructional development model. The research procedure comprised the following stages: (1) the Analysis stage, which involved reexamining students' learning needs and identifying problems in Occupational Health and Safety (OHS) instruction; (2) the Design stage, which included preparing the instructional content, storyboard, script, and learning scenarios for the animated learning video; (3) the Development stage, during which the learning media were produced using CapCut and Canva integrated with artificial intelligence applications, including ChatGPT, Gemini Veo, JoggAI, and DeepSeek, to support content generation, narration, and visual production. The developed prototype was subsequently evaluated by material and media experts using the validated research instruments, and the feedback obtained from the expert validation was used to revise and refine the learning media before implementation; (4) the Implementation stage, which involved a limited practicality evaluation through individual, small-group, and field trials involving students from the Cosmetology and Beauty Education Study Program; and (5) the Evaluation stage, which will examine the instructional effectiveness of the developed learning media using a quasi-experimental design in a subsequent phase of the research.

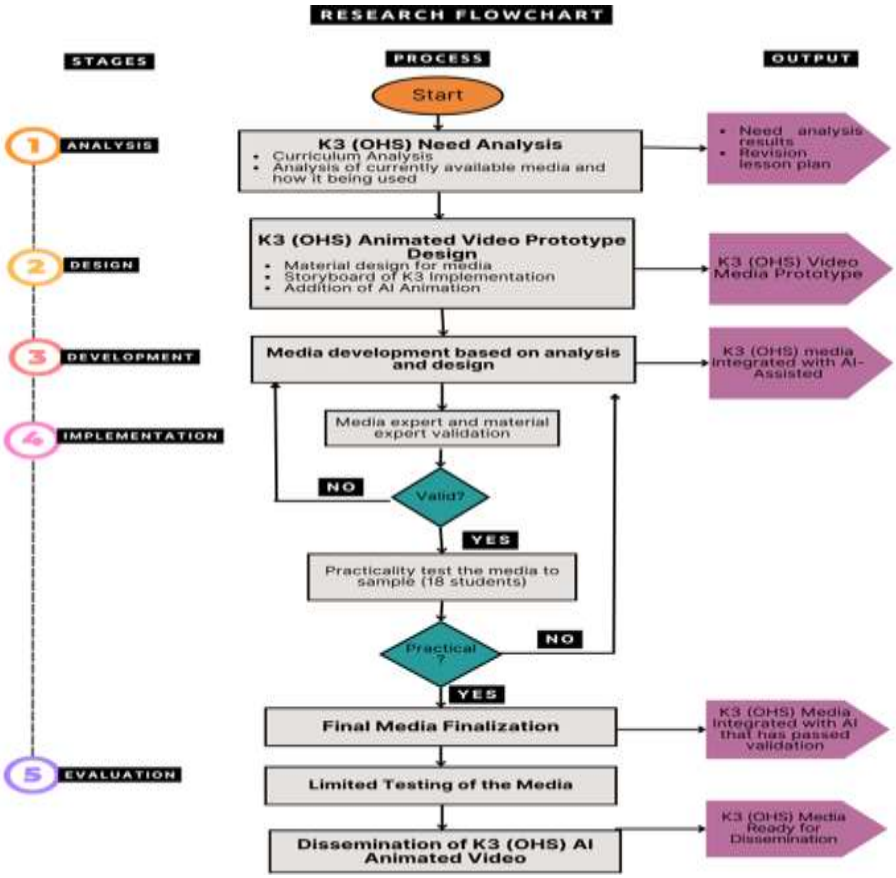

Figure 1. The Research Flowchart

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To establish the initial feasibility of the developed media, six validators were purposively selected based on their academic qualifications, professional expertise, and relevance to the objectives of this study. The validation panel consisted of three material experts and three media experts. The material experts were lecturers from the Cosmetology and Beauty Education Program. One expert holds a medical degree and a master's degree in Biomedical Sciences, with expertise in occupational health and human physiology. Another expert holds a master's degree in Pharmacy and specializes in cosmetic ingredients and chemical safety. The third holds a bachelor's degree in Cosmetology and Beauty Education and a master's degree in Vocational and Technology Education, with expertise in vocational learning and cosmetology education. The media experts were three lecturers in Educational Technology with expertise in instructional design, multimedia learning, and digital learning media development. All validators had experience in teaching, research, and learning media evaluation within their respective fields. They were selected because their academic qualifications and professional expertise were aligned with the content and media evaluation requirements of this study. To support the validity and practicality assessments, three research instruments were employed in this study a material validation sheet, a media validation sheet, and a student practicality questionnaire. The validation sheets were used to assess the accuracy of the instructional content, media design, and technical quality of the developed learning video, while the practicality questionnaire measured students' perceptions of the media's usability, attractiveness, and usefulness. The assessment indicators for each instrument are presented in Table 2 and 3.

Table 2. Assessment Indicators for Expert Validation

Aspect	Indicators
Content	Content accuracy, completeness, relevance to learning outcomes, content currency, and language clarity
Media	Visual and AI animation quality, interface design, navigation, audio quality, and media functionality

Table 3. Assesment Indicator For the Student Practically Questionnnaire

Aspect	Indicators
Content	Clarity of explanations, relevance to professional practice, depth of content, improvement of OHS understanding, usefulness for future professional practice
Media	Ease of use and navigation, visual appearance, AI animation quality, technical functionality and performance, user engagement

All instruments employed a five-point Likert scale ranging from 1 (very poor) to 5 (very good). The content validity of all instruments was assessed using Aiken's V coefficient based on expert judgment to determine the relevance, clarity, and representativeness of each item (Aiken, 1985). Items with an Aiken's V coefficient of 0.80 or higher were considered to have acceptable content validity. The reliability of the student practicality questionnaire was

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examined using Cronbach's Alpha to evaluate its internal consistency before it was administered during the practicality evaluation (Cronbach, 1951). A Cronbach's Alpha coefficient of 0.70 or higher was considered to indicate acceptable internal consistency. The collected data were analyzed descriptively by calculating the mean score for each assessment aspect. The resulting mean scores were then interpreted according to the predetermined assessment criteria to determine the validity and practicality of the developed learning media.

Result and Discussion

Result

This section presents the results of the AI-assisted learning media development based on the ADDIE model. The results include the development of the instructional media, expert validation, revisions made in response to expert feedback, and the practicality evaluation conducted with students.

Development of the AI-Assisted Learning Media

The development stage transformed the instructional storyboard into an AI-assisted animated learning media designed to support Occupational Health and Safety (OHS) instruction in cosmetology and beauty vocational education. The final product comprises six AI-assisted animated learning videos that address the core topics of the OHS curriculum. The media were designed to facilitate independent learning by integrating instructional videos, narration, visual animations, and interactive learning elements into a single learning resource. The overall appearance of the developed learning media is presented in Figure 2.

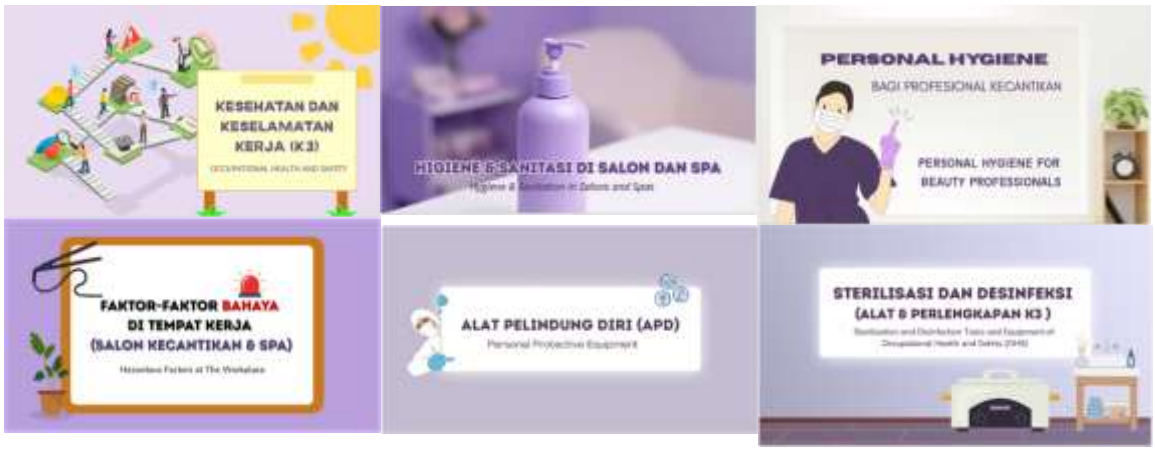

Figure 2. Display of Six OHS Animation Videos (a)OHS Concept, (b)Hygiene & Sanitation, (c)Personal Hygiene, (d)Hazard Factors, (e)PPE, (f)Sterilization.

As presented in Figure 2, each instructional video was designed to address a specific learning objective within the Occupational Health and Safety (OHS) in cosmetology and beauty education, as presented in Figure 2. Each video was developed to achieve a specific instructional objective: (1) *General OHS Concepts*, which introduces the fundamental principles, objectives, and importance of Occupational Health and Safety in cosmetology practice; (2) *Hygiene and Sanitation*, which explains hygiene and sanitation procedures required to maintain a safe and healthy salon environment; (3) *Personal Hygiene*, which demonstrates the personal hygiene standards expected of beauty professionals before, during, and after providing services; (4) *Workplace Hazard Factors*, which identifies physical,

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chemical, biological, ergonomic, and psychosocial hazards commonly encountered in cosmetology workplaces; (5) *Personal Protective Equipment (PPE)*, which explains the types, functions, and proper use of PPE during cosmetology procedures; and (6) *Sterilization and Disinfection*, which demonstrates the correct procedures for sterilizing and disinfecting beauty instruments to prevent cross-contamination and ensure client safety. The six instructional videos were developed through an integrated AI-assisted production workflow utilizing ChatGPT, DeepSeek, Gemini Veo 3, JoggAI, Canva, and CapCut. Each application served a specific function in the development process, including instructional script generation, content refinement, AI-generated animation, narration, visual design, and final video editing.

Expert Validation Results

Before evaluating the developed learning media, the research instruments were examined to ensure that they were suitable for data collection. Content validity was established through expert judgment using Aiken's V coefficient, while the internal consistency of the student practicality questionnaire was evaluated using Cronbach's Alpha. The results of the instrument validity and reliability analyses are presented in Tables 4–6.

Table 4. Content Validity Test Results of the Expert Validation Instrument

Aspect	Aiken`s V	Keterangan
Content	0,830	Valid
Media	0,860	Valid

Table 4 shows that the expert validation instrument achieved Aiken's V coefficients of 0.830 for the content aspect and 0.860 for the media aspect. Both values exceeded the minimum acceptable criterion of 0.80, indicating that the instrument possessed satisfactory content validity. Therefore, the instrument was considered appropriate for evaluating the instructional content and media quality of the developed AI-assisted learning videos.

Table 5. Content Validity Test Results of the Student Practicality Questionnaire

Aspek	*Aiken*`s V	Keterangan
Content	0,850	Valid
Media	0,871	Valid

Table 5 presents the content validity results of the student practicality questionnaire. The obtained Aiken's V coefficients were 0.850 for the content aspect and 0.871 for the media aspect, both exceeding the recommended threshold of 0.80. These findings indicate that the questionnaire items were considered relevant, clear, and representative for measuring students' perceptions regarding the practicality of the developed learning media.

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Table 6. Reliability Test Results of the Student Practicality Questionnaire.

Cronbanch Alpha	*N Of Items*
0,742	13

As presented in Table 6, the student practicality questionnaire obtained a Cronbach's Alpha coefficient of 0.742 across 13 items. Since the coefficient exceeded the commonly accepted threshold of 0.70, the questionnaire demonstrated acceptable internal consistency and was considered sufficiently reliable for use in the practicality evaluation.

Revision Of the Learning Media Based on Expert Feedback

Based on the suggestions provided by the material and media experts during the validation process, several revisions were made to improve the instructional quality, visual presentation, and scientific accuracy of the developed learning media. The revision process focused on enhancing the clarity of instructional content, correcting conceptual inaccuracies, and improving the overall appearance of the animated videos before they were implemented in the practicality evaluation. A summary of the revisions is presented in Table 7.

Table 7. Summary of Revisions Based on Expert Feedback

Validator Feedback	Before Revision	Revision Performed	After revision
Opening title appeared too plain and only used Indonesian language.	Simple Indonesian title slide.	Redesigned using bilingual (Indonesian–English) titles with a more attractive visual layout..	Professional bilingual opening title with improved visual appeal
Sterilization material required conceptual correction.	Only dry heat and moist heat sterilization were introduced.	dded the broader classification of sterilization methods (physical and chemical) before explaining individual techniques.	More scientifically accurate and systematically organized sterilization material
Illustration of microorganisms was scientifically inaccurate.	Microorganism illustration did not adequately represent pathogenic organisms.	Replaced the illustration with a scientifically appropriate image and revised the accompanying explanation.	Improved scientific accuracy and clearer visualization of pathogenic microorganisms.

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Table 8. Examples of Learning Media Revisions Based on Expert Feedback

Before	After
Revision 1. Opening Title	
	
Revision 2. Sterilization Material	
	
Revision 3. Microorganism Illustration	
	

As summarized in table 7 and table 8, the revisions primarily addressed visual presentation, scientific accuracy, and instructional organization. The opening title was redesigned using a bilingual format to improve readability and professionalism. The sterilization material was reorganized according to the correct classification of sterilization methods based on expert recommendations, while the microorganism illustration was replaced with a more scientifically accurate representation. These revisions improved both the instructional quality and scientific accuracy of the developed learning media before it was implemented in the student practicality evaluation.

Validation and Practicality Evaluation Results

The media that has been successfully prototyped is then tested and validated by involving 6 experts (3 Material Experts, 3 Media Experts). The aspects assessed at this stage include material substance, media quality (visual, audio, quiz), and ease of use. The results of the assessment on each aspect are shown in Table 9.

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Table 9. Validity Test Result

No	Aspects	Mean Score	Category
1	Material Expert Validation (Content)	4.6	Very Valid
2	Media Expert Validation (Technology)	4.2	Valid
	Overall Average	4.4	Very Valid

Table 9 displays the results of media validation scores. Overall, the media that have been developed obtained an average score of 4.4, which is included in the "Very Valid" category and feasible for use. Next, a practicality test was conducted on 18 students. The aspects assessed include the media and material aspects from the user's perspective.

Table 10. Practicality Test Result

No	Aspects	Mean Score	Category
1	Media Aspect (ease of use, visual audio, AI animation presence)	4.65	Very Practical
2	Material Aspect (content material)	4.86	Very Practical
	Overall Average	4.76	Very Practical

Table 10 displays the results of the media practicality score. Overall, the media that have been developed obtained an average score of 4.76. The limited trial with 18 students yielded a practicality score of 4.76 out of 5.00, classified as "Very Practical". Students reported that the media was user-friendly, the visual animations that generate by AI made complex concepts easier to understand. Based on the practicality test, students expressed that the AI-assisted animated video made the instructional process more engaging and prevented boredom.

Discussion

The development of AI-assisted animated videos for Occupational Health and Safety (OHS) in cosmetology education yielded high validity and practicality scores, aligning with previous research on AI-based learning media. The overall validity score of 4.4 (very valid) and practicality score of 4.76 (very practical) indicate that the media meets the established criteria for feasible learning media.

Comparison with Previous Research on AI-Based Video Validity

The validity results demonstrate that the AI-assisted animation video is highly appropriate for OHS learning in cosmetology education. The material expert gave a mean score of 4.58, and the media expert gave a mean score of 4.67, both falling into the 'very valid' category. When converted into descriptive percentages, these scores represent a material validity level of 91.6% and a media validity level of 93.4%. Sutanto & Af'idah(2025)reported an average validity score of 96% (very valid) for AI- and Canva-assisted animated videos on

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heat and temperature, while Putri et al.(2026) achieved 85% validity for Doratoon-based learning videos on theater arts. Mariyah et al.(2025) also obtained very high validity percentages from material experts (92%), design experts (95%), and media experts (94%) for AI-based digital videos on short story elements. The high validity scores of these animated videos across different subject matters and levels of education support the notion that systematically based models such as ADDIE can be used to develop animated videos that meet expert standards. Beyond the systematic development process provided by the ADDIE model, the high validity scores may also be explained by the Cognitive Theory of Multimedia Learning (CTML). According to (Mayer, 2024)meaningful learning occurs when learners actively integrate verbal and visual information through dual processing channels while managing the limited capacity of working memory. The integration of narration, AI-generated animations, and contextual visual demonstrations in the developed videos was designed to support these multimedia learning principles, thereby enhancing the instructional quality of the media and contributing to the favorable evaluations provided by both material and media experts. This theoretical perspective helps explain why both material and media experts rated the developed videos highly, as the instructional design successfully integrated complementary visual and verbal representations without sacrificing content accuracy.

The score of 4.6 for the material expert validation in this study confirmed that the OHS content for hygiene, sanitation, personal protective equipment (PPE) and sterilization is accurate, complete and relevant for learning objectives. This finding is in line with the work of Pratama et al. (2025) who emphasized that AI animation has great potential to improve content personalization and facilitate learning differentiation. The media expert validation score of 4.2 (valid) shows that the technical and visual quality of the six videos is acceptable, but slightly lower than the material aspect. This could be because the challenge of creating safety scenarios specific to cosmetology using AI tools, a challenge also highlighted by Febriansyah et al.(2026) who reported that teachers needed additional time to adapt AI-generated content to local contexts. Furthermore, the findings are consistent with (AlShaikh et al., 2024) who argued that the effectiveness of AI-assisted learning media depends not merely on the adoption of artificial intelligence, but on how AI-generated content is designed according to established multimedia learning principles. In the present study, AI applications such as ChatGPT, Gemini Veo, JoggAI, and DeepSeek did not function as autonomous instructional agents. Instead, they were employed to facilitate content generation, narration, and visual production under the guidance of instructional design principles.

Comparison with Previous Research on Practicality

The practicality score of 4.76 (very practical) obtained from the student responses is highly comparable to the findings of previous reference studies. When converted into a descriptive percentage format, this score represents a practicality level of 95.2%. Sutanto & Af'idah (2025) reported 98% practicality (very practical) from 31 students, and Putri et al. (2026) reported 91.67% (very practical) from 33 students and one teacher. Mariyah et al.(2025) achieved excellent category scores of 91% for individual trials, 95% for small group trials and

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95% for field trials. The higher practicality score in this study (95.2%) may be due to the context of cosmetology education, where students are very receptive to visual demonstrations of safety procedures that cannot easily be described with text only.

The high practicality score can also be interpreted through the perspective of Cognitive Load Theory. (Skulmowski & Xu, 2022) argued that well-designed digital learning environments should balance cognitive demands with learning benefits by minimizing unnecessary cognitive processing while maintaining learner engagement. In this study, the AI-assisted animated videos presented OHS procedures through realistic visual demonstrations and synchronized narration, enabling students to understand abstract safety concepts more easily without relying solely on textual explanations. Consequently, students perceived the learning media as easy to use, engaging, and beneficial for independent learning. This finding suggests that the multimedia design reduced unnecessary extraneous cognitive load, allowing students to allocate greater cognitive resources to understanding OHS concepts.

Students said the AI-generated animations made complex OHS concepts easier to understand and prevented boredom. This findingis consistent with Febriansyah et al.(2026), who found that AI-based animated videos increase students' interest, enthusiasm and active participation in learning. Similarly, Pratama et al.(2025) found that AI animation boosts students' motivation and engagement through dynamic and contextual visual presentations. Replaying the videos independently is also practical, as students can review safety procedures at their own pace, in line with the adaptive learning potential of AI animation highlighted by Pratama et al.(2025). These findings further support the view of (AlShaikh et al., 2024)who emphasized that AI technologies provide meaningful educational benefits when they are used to enhance instructional quality rather than merely introducing technological novelty. In the present study, AI applications facilitated the creation of realistic animations, narration, and visual scenarios while remaining guided by established instructional design principles. Overall, these findings suggest that the combination of systematic instructional design, multimedia learning principles, and AI-assisted content production can produce learning media that are both pedagogically valid and practically applicable for vocational education. Rather than replacing instructional designers, AI technologies functioned as supportive tools that enhanced the efficiency and quality of multimedia development while maintaining alignment with established educational theories.

Conclusion

Based on the development of artificial intelligence-assisted animated video learning media using the ADDIE model, it can be concluded that this media is highly valid and practical to support Occupational Health and Safety learning in cosmetology vocational education. The integration of various Artificial Intelligence applications enables the realistic visualization of occupational risks, helps enhance student understanding, and provides an interactive and adaptive learning experience. Expert validity assessment indicated that both the instructional content and media design met the required quality standards, while the practicality evaluation

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demonstrated highly positive responses from students regarding the usability and usefulness of the developed media.

Beyond establishing the feasibility of the developed media, this study contributes to the field of Educational Technology by demonstrating how generative artificial intelligence can be systematically integrated into the instructional design and development of interactive learning media using the ADDIE model. The findings provide practical evidence that AI-assisted multimedia can support the development of more engaging, contextually relevant, and learner-centered instructional resources for vocational education.

The developed learning media also has practical implications for vocational education, particularly in Occupational Health and Safety instruction within cosmetology and beauty programs. By presenting authentic workplace scenarios through AI-assisted animation, the media can support independent learning, improve students' awareness of occupational risks, and better prepare prospective beauty professionals to apply safe working practices in real workplace settings. Future research should evaluate the instructional effectiveness of the developed media using a quasi-experimental design involving a larger and more diverse sample of students.

Recommendation

The findings of this study suggest that future research should enhance the scope of practicality testing from a limited trial of 18 students to a broader field trial including many cohorts so that the validity and practicality outcomes gained can be better generalised. Further research is needed to assess the real learning effectiveness of the AI-assisted animated videos, especially their impact on students' knowledge retention, safety behaviour and risk perception, with a quasi-experimental or pre-test post-test design beyond the validity and practicality stages as presented in this article. Future research should focus on developing new OHS subjects beyond the current six films. It should also incorporate more advanced AI capabilities, like as interactive branching situations or AI-generated quizzes, to enhance the adaptive learning experience. Comparative analysis of several AI animation platforms and their respective effectiveness in creating context-specific, industry-relevant safety material for cosmetology would also be beneficial for media developers and instructional designers. In terms of barriers, the development process revealed that it took a considerable amount of time and refinement to modify AI-generated visuals to reflect accurate cosmetology-specific hazard scenarios because most AI tools are not trained specifically on salon or beauty industry settings, which can limit the accuracy of risk visualisation if not judiciously curated. Furthermore, the validation score of the media expert is slightly lower than that of the material aspect, indicating that the technical constraints of AI-generated animation (such as visual consistency and realism) still remain an issue to be addressed in future development. Practical challenges for educators wishing to duplicate this technique in other vocational education settings may be limited access to premium AI tools and the comparatively long production time required to edit and sync AI-generated narration with graphics. Therefore, future study should explore the collaboration of

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instructional designers, subject matter experts, and AI developers to streamline the production process and ensure the contextual accuracy of safety training content.

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Declaration of Generative AI and AI-Assisted Technologies

During the development of the learning media, the authors used generative artificial intelligence (AI) tools, including ChatGPT, Gemini Veo, JoggAI, and DeepSeek, to assist in generating instructional content, narration, visual assets, and animated learning materials. These tools were used solely to support the media development process and did not replace the authors' intellectual contributions in the research design, data collection, data analysis, interpretation of results, or manuscript preparation. The authors carefully reviewed, verified, and edited all AI-generated content and assume full responsibility for the accuracy and integrity of the work**.**

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