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Development of A Half up Half Down Hairstyling E-Module At State Vocational High School 27 Jakarta

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Abstract

The rapid development of technology in education has encouraged the use of innovative learning media to support independent, interactive, and effective learning processes. In hairstyling education, particularly in Half Up Half Down Hairstyling, learning media are needed to help students understand the material in a more engaging and systematic way. This study aimed to develop a Half Up Half Down Hairstyling e-module that is feasible, practical, and effective as a learning medium for Grade X students of the Beauty and Spa Expertise Program at SMK Negeri 27 Jakarta.This study employed the Research and Development (R&D) method using the ADDIE development model, consisting of Analysis, Design, Development, Implementation, and Evaluation stages. The research procedures included needs analysis, design, development, implementation, and evaluation. The developed product was an interactive e-module equipped with learning materials, supporting images, QR code-based tutorial videos, practice exercises, evaluations, interactive quizzes, and learning reflections.The results showed that the developed e-module had a very high level of feasibility. Material expert validation achieved a score of 93.33%, media expert validation achieved 94.66%, and language expert validation achieved 90%, all of which were categorized as very feasible. The practicality test conducted through the one-to-one stage obtained a score of 85%, while the small group stage obtained a score of 94.72%, indicating that the e-module was very practical. The effectiveness test showed an increase in students' average scores from 95.29 in the pretest to 96.18 in the posttest. Based on these findings, the Half Up Half Down Hairstyling e-module is considered feasible, practical, and effective as an independent learning medium at SMK Negeri 27 Jakarta.

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Introduction

Learning is a process of interaction between students, educators, and learning resources within a learning environment facilitated by educators to enable the acquisition of knowledge, skills, habits, as well as the development of attitudes and beliefs among students (Jusmawati et al., 2021). Effective learning aimed at achieving instructional objectives requires learning media as an intermediary in delivering learning materials. Learning media play a crucial role in assisting educators in presenting content systematically and attractively, thereby enhancing students' understanding and engagement in the learning process (Wahyuni, Agustini, & Sudiartha, 2025).

Along with the rapid advancement of information technology, one of the learning media that has developed significantly is the electronic module (e-module). An e-module is a digital, non-print learning medium designed to facilitate students' independent learning. It is also referred to as an independent learning medium because it incorporates audiovisual explanations that enable students to understand the material autonomously. Therefore, e-modules can effectively support students in their learning activities (Ahdhianto et al., 2021). Interactive electronic modules serve as valuable educational resources in the learning process, allowing students to access and interact with the modules using personal computers (PCs), laptops, or smartphones, thereby enabling learning anytime and anywhere (Rahmatsyah & Dwiningsih, 2021). The use of e-modules in the learning process offers several advantages. First, e-modules enrich students' learning experiences by incorporating images, videos, and audio to support content comprehension. Second, students can access e-modules anytime and anywhere, provided they have an electronic device and an internet connection. Third, e-modules can function as interactive assessment tools (Wulandari et al., 2021).

Based on theories and expert opinions, learning media are essential tools in supporting the teaching and learning process. Based on observations conducted during the Field Work Practice (PKL) at SMK Negeri 27 Jakarta, it was found that some students obtained scores below the Minimum Mastery Criterion (KKM) in the Hair Styling subject. Furthermore, SMK Negeri 27 Jakarta still faces limitations in the use of e-modules as learning media, particularly in the Hair Styling course focusing on the Half Up Half Down hairstyle. As a result, students experience difficulties in understanding the work procedures independently due to the lack of interactive and visually based learning media. Practical learning has primarily relied on teacher explanations and brief demonstrations, leaving students without learning media that they can use to review and better understand the stages of hairstyling independently.

One of the topics taught in the Hair Styling subject is the Half Up Half Down hairstyle. This topic was selected because it aligns with the hair styling competencies that students are expected to master. In addition, the Half Up Half Down hairstyle represents a modern hairstyling variation with a moderate level of difficulty, making it suitable for students' foundational skills. This topic is also included in the Learning Outcomes of the Merdeka Curriculum under the Hair Styling practical element. Furthermore, the Half Up Half Down hairstyle was chosen because it requires systematic work procedures and practical skills. It is also closely related to the researcher's experience during the Field Work Practice (PKL) at SMK Negeri 27 Jakarta.

The Half Up Half Down hairstyle requires students to understand systematic work procedures and perform practical skills accurately. Therefore, students need interactive and visually based learning media that enable them to independently understand each stage of the hairstyling process. Based on the background of the problem, this study is necessary to develop a learning medium in the form of an

electronic module (e-module). The e-module developed in this study is intended to serve as a supplementary independent learning resource for students. Teachers act as facilitators by guiding and assisting students in utilizing the e-module during practical learning activities. Therefore, the e-module is not intended to replace the primary instructional tools, such as lesson plans, but rather to function as a supporting learning medium that helps students understand the work procedures independently.

Therefore, this study aims to develop a Half Up Half Down Hair Styling Learning E-Module as a supporting learning medium for practical instruction at SMK Negeri 27 Jakarta. The developed e-module is expected to help students understand the hairstyling procedures more easily and systematically. Furthermore, it is expected to enrich the availability of learning media at SMK Negeri 27 Jakarta and serve as an innovation that supports the achievement of effective and high-quality learning outcomes.

Methods

Provide This study employed the Research and Development (R&D) method to develop an instructional e-module for the Half Up Half Down Hair Styling topic. Research and Development (R&D) is a research method conducted through a series of systematic processes to develop new products or improve existing ones (Sari, 2022). The development process adopted the ADDIE model, consisting of five stages: Analyze, Design, Development, Implementation, and Evaluation (Branch, 2009). The study was conducted at SMK Negeri 27 Jakarta with Grade X students of the Beauty and Spa program, specializing in Skin and Hair Beauty, during the second semester of the 2024/2025 academic year. The analysis stage involved classroom observations, questionnaires administered to students, and interviews with subject teachers to identify learning needs and problems encountered in the Hair Styling course. The findings indicated that limited learning resources contributed to students' low achievement, thereby highlighting the need for an interactive e-module as a supplementary learning medium.

During the design and development stages, the e-module was systematically designed to include learning outcomes, theoretical materials, visual illustrations, tutorial videos, practical procedures, learning activities, evaluation questions, and student reflections. The initial prototype was created using Canva and Microsoft Publisher to produce an attractive and interactive learning resource. The product was subsequently validated by material experts, media experts, and language experts to evaluate the appropriateness of the content, visual design, and language quality. Product validation is an essential process in R&D to ensure that the developed product is practical, effective, and feasible for implementation (Sugiyono, 2019). The assessment instruments were developed based on the learning media evaluation indicators issued by BSNP (2014) and the instrument development procedures proposed by Arikunto (2014, 2017) and Sugiyono (2019).

The implementation stage consisted of an individual trial (one-to-one) involving three students, followed by a small-group trial involving nine students to evaluate the practicality of the developed e-module. After revisions based on expert validation and student feedback, a field test was conducted with Grade X students to determine the effectiveness of the e-module through pretest and posttest. Data were collected through observation, interviews, and questionnaires (Sugiyono, 2019), while questionnaire responses were measured using a five-point Likert scale (Sugiyono, 2019). The collected data were analyzed quantitatively by calculating the percentage scores of feasibility and practicality, whereas the effectiveness of the e-module was determined by comparing the mean scores of the pretest and posttest to identify improvements in students' learning outcomes (Arikunto, 2014).

Results and Discussions

1. Results Results of the E-Module Development

This study resulted in the development of a learning e-module on Half Up Half Down Hair Styling, targeting Grade X students (Phase E) at SMK Negeri 27 Jakarta. The research was conducted at SMK Negeri 27 Jakarta, located at Jl. Dr. Sutomo No. 1, Pasar Baru District, Central Jakarta. The e-module was developed using the ADDIE instructional design model, which consists of the following stages:

a. Analysis

The analysis stage was the initial phase of the ADDIE development model. This stage began with an analysis of the curriculum implemented for Phase E students in the Beauty and Spa program at SMK Negeri 27 Jakarta. Following the curriculum analysis, an analysis of the competency standards based on the Indonesian National Work Competency Standards (SKKNI) was conducted. According to SKKNI Unit Code KEC.TR.02.006.01, the competency unit is entitled Hair Styling, which corresponds to the Learning Outcomes specified in the Merdeka Curriculum. The needs analysis was further conducted through classroom observations and interviews with the Hair Styling teacher at SMK Negeri 27 Jakarta. The observation results indicated that the learning process primarily relied on PowerPoint presentations and teacher explanations. Furthermore, no learning e-module was available to enable students to study the Half Up Half Down Hair Styling material independently.

Based on the interview results, the teacher expressed the need for a learning medium that could assist students in understanding both the theoretical content and the practical procedures of Half Up Half Down Hair Styling in a more systematic manner. Therefore, the development of the learning e-module was expected to provide an alternative learning resource that is engaging, easily accessible, and suitable for independent learning. Based on the curriculum analysis and the identified learning needs, the development of a Half Up Half Down Hair Styling learning e-module was considered necessary for Grade X students in the Beauty and Spa specialization at SMK Negeri 27 Jakarta.

b. Design

The design stage involved planning and designing the learning e-module. During this phase, the researcher prepared the content framework, e-module components, and storyboard to serve as the foundation for product development. The storyboard was developed based on the learning outcomes, learning objectives, and instructional materials to be presented in the e-module.

c. Development

During the development stage, the storyboard and the initial design created in the previous phase were transformed into a complete learning e-module for Half Up Half Down Hair Styling. The e-module consisted of several instructional components, including the cover page, module identity, preface, user guide, table of contents, learning materials, tutorial videos, practice exercises, evaluation questions, and references. The developed product was subsequently validated by subject matter experts, media experts, and language experts to obtain suggestions for improvement and ensure that the final product was suitable for implementation in the learning process.

d. Cover E-Module

The e-module cover serves as the opening page and contains the title of the e-module, the developer's identity, and an illustration relevant to the learning material. The cover was designed to attract students' interest and encourage them to learn the Half Up Half Down Hair Styling material.

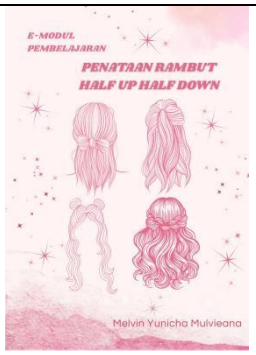


Figure 1. Cover e-modul

e. E-Module Identity and Learning Outcomes

At this stage, the e-module identity was developed to include the study program, learning phase, grade level, unit code, Indonesian National Work Competency Standards (SKKNI), Learning Outcomes (CP), and Learning Objectives (TP) that served as the foundation for the instructional content presented in the e-module.



Figure 2. E-Module Identity and Learning Outcomes

f. E-Module User Guide

At this stage, instructions for using the e-module were provided to help students understand the procedures for utilizing the e-module effectively throughout the learning process.

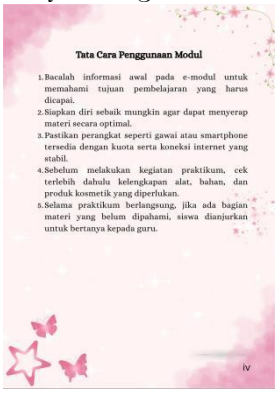


Figure 3. E-Module User Guide

g. E-Module Learning Materials

The learning materials were organized systematically and covered the concepts, characteristics, and procedures of Half Up Half Down Hair Styling, enabling students to understand the instructional content more effectively.



Figure 4. E-Module Learning Materials

h. Learning Video Tutorial (QR Code)

The e-module was complemented with a learning video tutorial that could be accessed via a QR Code, allowing students to observe and understand the Half Up Half Down Hair Styling procedures more clearly and interactively.



Figure 5. Learning Video Tutorial (QR Code)

i. E-Module Learning Activities

This section contains the learning objectives, achievement indicators, and formative assessments designed to support students in achieving the expected competencies throughout the learning process.



Figure 6. Learning Activities

j. E-Module Evaluation

The evaluation section was designed to assess students' understanding of the learning materials through questions developed based on the established learning objectives.



Figure 7. E-Module Evaluation

k. Digital Interactive Quiz

A digital interactive quiz was incorporated as a technology-based assessment tool that enables students to evaluate their understanding of the learning materials independently in an engaging manner.



Figure 8. Digital Interactive Quiz

l. Student Reflection

The student reflection section was designed to identify students' learning experiences, level of understanding, and challenges encountered after using the e-module.



Figure 9. Student Reflection

m. E-Module References

The references section contains the sources used in developing the e-module, providing a valid and reliable foundation for the instructional materials presented.



Figure 10. References

n. Implementation

The implementation stage was carried out after the e-module had been declared feasible by the subject matter experts, media experts, and language experts. The e-module was subsequently implemented with Grade X students of the Beauty and Spa specialization at SMK Negeri 27 Jakarta. The implementation included a one-to-one practicality test involving three students and a small-group practicality test involving nine students. In addition, pretests and posttests were administered to evaluate the effectiveness of the Half Up Half Down Hair Styling learning e-module.

o. Evaluation

The evaluation stage was conducted based on the results of the expert validations. At this stage, the e-module was revised according to the feedback and recommendations provided by the subject matter, media, and language experts. Following the revisions and confirmation of its feasibility, the e-module was tested for practicality and effectiveness with the target students. The findings indicated that the e-module was suitable for use as an independent learning medium for Half Up Half Down Hair Styling among Grade X students in the Beauty and Spa specialization at SMK Negeri 27 Jakarta.

2. E-Module Feasibility

a. Results of the Feasibility Assessment by the Subject Matter Expert

The feasibility assessment was conducted by the subject matter expert, Mrs. Nurhayati, S.Pd., a Hair Styling teacher at SMK Negeri 27 Jakarta. The purpose of this assessment was to evaluate the feasibility of the learning materials presented in the Half Up Half Down Hair Styling e-module. The results of the Stage I and Stage II assesments conducted by the subject matter expert are presented below.

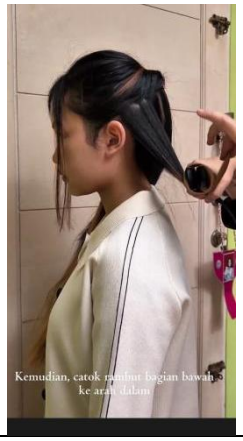
Table 1. Percentage Score Calculation Results of the Feasibility Assessment by the Subject Matter Expert

Assessment Aspect	Item No	Subject Matter Expert Assessment	
		Stage I	Stage II
E-Module Organization	1	5	4
	2	3	5
	3	5	5
	4	5	5
	5	5	5
	6	5	5
	7	5	5
	8	5	5
	9	3	4
	10	3	4
	11	3	4
E-Module Functionality	12	5	5
	13	5	5
	14	5	5
	15	5	5
	16	3	4
	17	3	4
	18	5	5
Total Score		78	84
E-Modul Feasibility Score (N)		E-Modul Feasibility Score (N)	
$N = \frac{78}{5 \times 18 \times 1} \times 100\ \%$		$N = \frac{84}{5 \times 18 \times 1} \times 100\%$	
$N = \frac{78}{90} \times 100\ \%$		$N = \frac{84}{90} \times 100\ \%$	
N = 86,67%		N = 93,33 %	
E-Module Feasibility Score Subject Matter Expert Assessment		E-Module Feasibility Score Subject Matter Expert Assessment	
Stage I = 86,67 %		Stage II = 93,33 %	

Based on the results of the first-stage feasibility assessment conducted by the subject matter expert on May 9, 2026, the e-module obtained a feasibility score of 86.67%. According to the established feasibility criteria, this percentage falls into the "Highly Feasible" category. Subsequently, the e-module was revised based on the suggestions and recommendations provided by the validator. After the evaluation and revision process, a second-stage validation was conducted, resulting in a feasibility score

of 93.33%, which also falls into the "Highly Feasible" category. These findings indicate that the developed Half Up Half Down Hair Styling e-module meets the criteria of "Highly Feasible" based on the subject matter expert validation and is suitable for use as a learning medium for Grade X students in the Beauty and Spa specialization at SMK Negeri 27 Jakarta. Table 4.2. Revision Results Based on the Subject Matter Expert's Suggestions Based on the revisions made following the suggestions and recommendations provided by the subject matter expert during the first validation stage, the tutorial video was improved by adding explanatory text to each stage of the learning process. During the second validation stage, the subject matter expert confirmed that the e-module was suitable for implementation; therefore, no further revisions were required.

Table 2. Revision Results Based on the Subject Matter Expert's Suggestions

No	Suggestions and Recommendations	Stage I (Before Revision)	Stage II (After Revision)
1.	The tutorial video should include explanations of the hair combing technique and ponytail creation.		
2.	Additional explanations of the curling direction and curling technique should be included.		

3.	Additional explanations of the technique for creating hair volume after the twisting process should be included.	 

Based on the revisions made following the suggestions and recommendations provided by the subject matter expert during the first validation stage, the tutorial video was improved by adding explanatory text to each stage of the learning process. During the second validation stage, the subject matter expert confirmed that the e-module was suitable for implementation; therefore, no further revisions were required.

b. Results of the Feasibility Assessment by the Media Expert

The feasibility assessment was conducted by the media expert, Dr. Dede Kurnia Adiputra, S.Pd., M.Pd., a lecturer specializing in Educational Technology. The purpose of this assessment was to evaluate the feasibility of the developed learning media in the form of the Half Up Half Down Hair Styling e-module. The results of the Stage I and Stage II assessments conducted by the media expert are presented below.

Table 3. Percentage Score Calculation Results of the Feasibility Assessment by the Media Expert

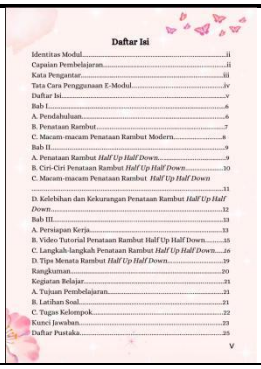
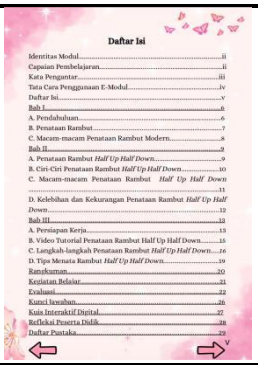
Assessment Aspect	Item No	Subject Matter Expert Assessment	
		Stage I	Stage II
E-modul Design	1	5	5
	2	4	4
	3	4	4
	4	4	5
	5	4	4
	6	4	5
	7	4	5
	8	4	4
	9	4	5
	10	5	5
	11	5	5
	12	4	5
E-modul Characteristics	13	4	5
	14	5	5
	15	5	5
Total Score		65	71
E-Modul Feasibility Score (N)		E-Modul Feasibility Score (N)	

$N = \frac{65}{5 \times 15 \times 1} \times 100\ \%$	$N = \frac{71}{5 \times 15 \times 1} \times 100\%$
$N = \frac{65}{75} \times 100\ \%$	$N = \frac{71}{75} \times 100\ \%$
N = 86,66%	N = 94,66%
E-Modul Feasibility Assessment by the Media Expert	E-Modul Feasibility Assessment by the Media Expert
Stage I = 86,66 %	Stage II = 94,66%

Based on the results of the first-stage feasibility assessment conducted by the media expert on May 19, 2026, the e-module obtained a feasibility score of 86.66%, which falls into the "Highly Feasible" category. Subsequently, the researcher revised and improved the e-module based on the suggestions provided by the validator. After the evaluation and revision process, a second-stage media expert validation was conducted, resulting in a feasibility score of 94.66%, which also falls into the "Highly Feasible" category. Based on these findings, it can be concluded that the developed Half Up Half Down Hair Styling e-module meets the criteria of "Highly Feasible" and is suitable for use as a learning medium for Grade X students in the Beauty and Spa specialization at SMK Negeri 27 Jakarta.

Table 4. Revision Results Based on the Media Expert's Suggestions

No.	Suggestions and Recommendations	Stage I (Before Revision)	Stage II (After Revision)
1.	The size and quality of the images should be improved to make the hair styling details more clearly visible.		
2.	The layout, formatting, and punctuation of the e-module require improvement	Several inconsistencies were identified in the writing, layout, and use of punctuation throughout the e-module.	The writing, layout, and punctuation were revised, resulting in a more organized and consistent appearance of the e-module.

3.	Additional interactive features should be incorporated to enhance students' engagement in the learning process.	 

Based on the suggestions and recommendations provided by the media expert during the first validation stage, the researcher revised the visual and interactive aspects of the e-module. The revisions included improving the quality of the images, refining the layout and text formatting, and adding interactive features such as a digital quiz, navigation buttons, hyperlinks, and QR codes linking to the tutorial videos. During the second-stage validation, the media expert confirmed that the e-module had met the required feasibility criteria and that no further revisions were necessary.

c. Results of the Feasibility Assessment by the Language Expert

The feasibility assessment was conducted by the language expert, Abdul Aziz Nurahman, S.S., M.Pd., an Indonesian Language teacher at SMK Negeri 27 Jakarta. The purpose of this assessment was to evaluate the linguistic quality of the Half Up Half Down Hair Styling e-module. The results of the Stage I and Stage II assessments conducted by the language expert.

Table 5. Percentage Score Calculation Results of the Feasibility Assessment by the Language Expert

Assessment Aspect	Item No	Assessment	
		Stage I	Stage II
Clarity	1	5	5
	2	5	5
Communicativeness	3	4	4
	4	4	5
Dialogic and Interactive	5	4	4
	6	4	4
Appropriateness for Studensts	7	4	4
	8	4	4
Language Conventions	9	4	5
	10	4	5
Total Score		42	45
E-Modul Feasibility Score (N) $N = \frac{42}{5 \times 10 \times 1} \times 100\ \%$ $N = \frac{42}{50} \times 100\ \%$		E-Modul Feasibility Score (N) $N = \frac{45}{5 \times 10 \times 1} \times 100\ \%$ $N = \frac{45}{50} \times 100\ \%$	

N = 84% E-modul Feasibility Assessment by the Language Expert	N = 90% E-modul Feasibility Assessment by the Language Expert
Stage I = 84%	Stage II= 90%

Based on the results of the Stage I feasibility assessment conducted by the language expert on May 26, 2026, the e-module obtained a feasibility score of 84%, which falls into the "Highly Feasible" category. Subsequently, the researcher revised and improved the e-module based on the suggestions provided by the validator. Following the revision process, the Stage II validation resulted in a feasibility score of 90%, which also falls into the "Highly Feasible" category. Based on these findings, it can be concluded that the Half Up Half Down Hair Styling e-module is highly feasible for use as an independent learning medium for Grade X students in the Beauty and Spa specialization at SMK Negeri 27 Jakarta.

Table 6. Revision Results Based on the Language Expert's Suggestions

No.	Suggestions and Recommendations	Stage I (Before Revision)	Stage II (After Revision)
1.	Several typographical errors in the e-module need to be corrected.	There are still several typographical errors in the sentences presented in the e-module.	The typographical errors have been corrected, resulting in an e-module that is systematically organized, logically structured, and easy for students to understand.

Based on the suggestions and recommendations provided by the language expert during the Stage I validation, the researcher corrected several typographical errors identified in the e-module. After the revisions were completed, the Stage II validation indicated that the e-module was systematically organized, logically structured, and easy for students to understand.

d. Results of the One-to-One Practicality Test

After the Half Up Half Down Hair Styling e-module had been declared feasible by the subject matter experts, media experts, and language experts, its practicality was evaluated through a one-to-one trial. The trial involved three Grade X students from the Beauty and Spa specialization at SMK Negeri 27 Jakarta. The purpose of the one-to-one trial was to evaluate the ease of use, presentation of learning materials, visual appearance, and overall usefulness of the developed e-module. The results of the one-to-one practicality test are presented below.

Table 7. Percentage Score Calculation Results of the One-to-One Practicality Test

Assessment Aspect	One-to-One Practicality Test Score
Ease of Use	24
Presentation of Learning Materials	25
Visual Appearance	26
Benefits of the E-Module	27
Total Score	102

E-modul Practicality Score

$N = \frac{102}{5 \times 8 \times 3} \times 100\ \%$

$N = \frac{102}{120} \times 100\ \%$

$N = 85\%$

The E-Module Practicality Score in the One-to-One Trial was 85%

Based on the results of the one-to-one trial involving three Grade X students in the Beauty and Spa specialization at SMK Negeri 27 Jakarta, the Half Up Half Down Hair Styling e-module achieved a practicality score of 85%. This percentage indicates that the developed e-module falls into the "Highly Practical" category. Therefore, the e-module was considered sufficiently practical to proceed to the small-group trial stage.

e. Results of the Small-Group Practicality Test

The small-group trial involved nine Grade X students from the Beauty and Spa specialization at SMK Negeri 27 Jakarta. The results of the small-group practicality test are presented below.

Table 8. Percentage Score Calculation Results of the Small-Group Practicality Test

Assessment Aspect	Practicality Test Score
Kemudahan Penggunaan	84
Presentation of Learning Materials	85
Visual Appearance	87
Benefits of the E-Module	85
Total Score	341

E-modul Practicality Score

$N = \frac{341}{5 \times 8 \times 9} \times 100\ \%$

$N = \frac{341}{360} \times 100\ \%$

$N = 94{,}72\%$

The E-Module Practicality Score in the One-to-One Trial was 94,72%

Based on the results of the small-group trial, the Half Up Half Down Hair Styling e-module obtained a practicality score of 94.72%, which falls into the "Highly Practical" category. These findings indicate that the developed e-module is practical for use as an independent learning medium for Grade X students in the Beauty and Spa specialization at SMK Negeri 27 Jakarta.

f. Results of the E-Module Effectiveness Test (Pretest and Posttest)

The effectiveness test was conducted to determine the improvement in students' cognitive learning outcomes after using the Half Up Half Down Hair Styling e-module. Effectiveness was measured through a pretest administered before students used the e-module and a posttest administered afterward. The test involved 34 Grade X students in the Beauty and Spa specialization at SMK Negeri 27 Jakarta.

Table 9. Comparison of Students' Pretest and Posttest Results

Description	Pretest	Posttest
Number of Respondents	34	34
Highest Score	100	100

Lowest Score	10	10
Total Score	3240	3270
Mean Score	95,29	96,18

The mean scores of the pretest and posttest were calculated using the following formula: $\bar{x}=\frac{\sum X}{N}$

Where:

$\bar{X}$ = Mean score (mean)

$\sum X$ = Total score of all students

N = Number of students

Calculation of the Mean Pretest Score

$\bar{X}=\frac{3240}{34}$

$\bar{X}$ = 95,29

Calculation of the Mean Pretest Score

$\bar{X}=\frac{3270}{34}$

$\bar{X}$ = 96,18

The results showed that the mean pre-test score was 95.29, whilst the mean post-test score increased to 96.18. This represents an average improvement of 0.89 points following the use of the Half Up Half Down Hair Styling e-module. These findings indicate a positive change in students' cognitive learning outcomes, although the magnitude of improvement was relatively small. The result should be interpreted cautiously because no statistical significance test was reported. Nevertheless, digital learning resources can support the development of knowledge and practical competencies when instructional content is structured to meet specific learning objectives (Adeoye et al., 2024). The relatively high pre-test score suggests that students already possessed substantial prior knowledge of Half Up Half Down Hair Styling. This knowledge may have been acquired through previous practical experience, online learning resources, and social media tutorials. Consequently, the limited score improvement may partly reflect students' existing competence and the relatively high starting point. However, the increase in the post-test score indicates that the e-module may provide additional learning support. Octaviani and Sari (2023) reported positive relationships between independent learning approaches and students' motivation and interest in vocational education, supporting the relevance of accessible learning resources for students' independent study.

This study developed the e-module using the ADDIE instructional design model, comprising Analysis, Design, Development, Implementation, and Evaluation. Expert validation indicated that the product was categorised as highly feasible. These findings suggest that the instructional content, visual presentation, and language were considered appropriate for the intended learning objectives and target learners. The systematic nature of ADDIE supports the alignment of learning objectives, instructional materials, implementation, and evaluation (Adeoye et al., 2024). Similarly, Dilaines et al. (2024) demonstrated the application of ADDIE in developing supplementary digital learning modules. Following revisions based on expert recommendations, the e-module was considered suitable for classroom implementation. The one-to-one practicality test yielded a score of 85%, whilst the small-group practicality test achieved 94.72%. Both results fell within the highly practical category under the assessment criteria used in this study. These findings indicate that students generally responded positively to the module's usability and presentation. The higher small-group score suggests more favourable evaluations during the subsequent testing stage, although the difference alone does not

establish improved usability. Comparable findings were reported by Tanjung et al. (2024), whose digital flipbook for basic hair-beauty practical learning received high feasibility ratings from subject experts and positive responses from students. These results support the potential of digital instructional media to facilitate access to vocational learning materials.

The developed e-module functions not merely as an information source but also as a structured independent learning resource. Its integration of instructional materials, illustrations, tutorial videos, exercises, assessment questions, and reflection activities allows students to revisit procedural information and learn at their own pace. In practical vocational education, video-based interactive media can support the acquisition of procedural knowledge and practical skills by allowing learners to observe and repeat demonstrations (Hamsar, 2025). However, the present study primarily measured cognitive learning outcomes and did not establish whether the e-module improved students' practical hair-styling performance. Future evaluations should therefore incorporate performance-based assessments to determine whether improvements in theoretical understanding translate into practical competence. Overall, the expert validation results, practicality assessments, and pre-test and post-test scores indicate that the Half Up Half Down Hair Styling e-module meets the study's criteria for feasibility, practicality, and initial learning effectiveness. The product is therefore a potentially useful independent learning resource for Grade X students specialising in Beauty and Spa at SMK Negeri 27 Jakarta. Nevertheless, the small mean score increase, high baseline performance, and absence of reported inferential testing limit conclusions about its effectiveness. Future research should involve a larger sample, appropriate statistical testing, and comparisons with alternative instructional approaches. Practical skill assessments and delayed post-tests would also help determine whether the e-module supports skill acquisition and knowledge retention beyond immediate cognitive outcomes.

Conclusion

This study employed a Research and Development (R&D) approach to develop a Half Up Half Down Hair Styling e-module for Grade X students in the Beauty and Spa specialization at SMK Negeri 27 Jakarta using the ADDIE development model, which consists of the Analysis, Design, Development, Implementation, and Evaluation stages. Through these stages, an e-module was developed and subsequently subjected to expert validation, revision, practicality testing, student response evaluation, and effectiveness testing. The findings revealed that the Stage I subject matter expert validation yielded a feasibility score of 86.67%, indicating that the e-module was feasible with revisions required. After revisions were made based on the validator's recommendations, the Stage II validation score increased to 93.33%, placing the e-module in the Highly Feasible category. The Stage I media expert validation resulted in a feasibility score of 86.66%, which was categorized as Highly Feasible. Following improvements based on the validator's feedback, the Stage II validation score increased to 94.66%, remaining in the Highly Feasible category. Similarly, the Stage I language expert validation produced a feasibility score of 84%, indicating that the e-module was feasible with revisions required. After the recommended revisions were completed, the Stage II validation score increased to 90%, placing it in the Highly Feasible category.

The practicality test results showed that the e-module achieved a score of 85% in the one-to-one trial, indicating that it was Highly Practical. In the small-group trial, the practicality score increased to 94.72%, which also falls into the Highly Practical category. The effectiveness test demonstrated that the students' mean pretest score was 95.29, while the mean posttest score increased to 96.18, representing an average improvement of 0.89 points after the implementation of the e-module. Therefore, it can be concluded that the developed Half Up Half Down Hair Styling e-module is highly feasible, highly

practical, and effective for use as an independent learning medium for Grade X students in the Beauty and Spa specialization at SMK Negeri 27 Jakarta.

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