ETDC Indonesian Journal of Research and Educational Review
Volume 4, No. 3, 2025, pp 676 - 685
e–ISSN 2809-3682
p–ISSN 2809-7505

https://doi.org/10.51574/ijrer.v4i3.3087

# Development of Digital-Based Interactive E-Module on Body Measurement and Blouse Pattern Making Material at Public Vocational School

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**Article Info**

***Article history:***

*Received April 17, 2025*
*Revised June 12, 2025*
*Accepted June 19, 2025*

***Keywords:***

*ADDIE;*
*Blouse Pattern;*
*Digital Interactive;*
*E-Module;*
*Vocational School.*

**ABSTRACT**

The study aims to determine the feasibility of implementing a digital-based interactive e-module on body measurement and blouse pattern making at a public vocational school. Additionally, the study aims to determine the students' responses to the digital-based interactive e-module that covers body measurement and blouse pattern making. The development method used by the researcher refers to the ADDIE (Analyze, Design, Development, Implementation, and Evaluation) model for research development. We conducted this research at public vocational school 5 Malang. Statistical tests are carried out to change quantitative data into data that can be interpreted descriptively to determine the feasibility of digital-based interactive e-modules. The findings showed that based on the validation results from the two validators, the present digital-based interactive e-module is declared feasible and can be used in research to make it easier for students to understand learning materials. The student response questionnaire results indicated a percentage of 83.6%, which falls under the "very good" criteria; thus, the interactive e-module is considered very practical for students in class X Fashion Design and Production at Public Vocational School 5 Malang.



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## 1. INTRODUCTION

The fashion industry is currently expanding, which requires vocational high school graduates majoring in fashion design and production to master advanced practical skills (Murzyn-Kupisz & Hołuj, 2021). This major has a basic fashion subject in class X, phase E, which studies body measurements and blouse pattern making. Body measurements and blouse pattern making are certainly crucial in making clothes; this skill is a basic competency that needs to be mastered by students in supporting the skills that students have to make clothing that has a satisfactory level of comfort in its use. At the current vocational school level that uses the independent curriculum, teachers are required to have learning media (Jatmoko et al., 2023; Haryono, 2024). This is a must

because of the rules issued by the government that the availability of media in the form of teaching modules is an obligation for teachers in schools.

Learning media is everything to convey information effectively and efficiently in learning activities (Smaldino et al., 2019; Hadi et al., 2022). Learning media can provide uniform stimulation to students, resulting in similar educational outcomes. Currently, the rapid advancement of technology means that digital-based learning media can serve as a solution to improve student understanding (Nurhayati et al., 2024). Interactive learning media is a medium that users can control and choose what to learn next. This interactive media aims to present information in a fun, intriguing, easy-to-understand, and clear form (Saputri et al., 2018; Kustyarini et al., 2020).

This aligns with the implementation of the independent curriculum, which encourages the use of innovative media designed to enhance student independence in learning (Rufaidah et al., 2021). Interactive e-modules encourage students to learn in collaboration with teachers or independently by utilizing multimedia, such as video tutorials and interactive quizzes that are easier for learners to understand. The use of digital technology in learning is a step to improve the quality of learning in vocational high schools and help students overcome obstacles in understanding the material with a more modern approach adapted to the learning style of Generation Z, who prefer a visual and interactive approach (Antonietti et al., 2022; Habibi et al., 2023). Learning using interactive media has more effective learning outcomes compared to learning with conventional media (Yu et al., 2022). This is because learning media is deemed relevant to today's students, as Generation Z students are familiar with technology and tend not to become easily bored during the learning process. The development of digital-based learning media in the fashion sector is still limited, so students and teachers need e-modules that are specifically designed to support learning in basic fashion subjects, especially related to competencies in body measurement and blouse pattern making.

E-modules, also known as electronic modules, represent the transformation of printed modules into a digital format (Syahrial et al., 2021; Fitriana et al., 2024). E-modules serve as systematically designed digital teaching materials, assisting students in achieving their learning objectives (Delıta et al., 2022; Mutia et al., 2025). E-modules are usually equipped with multimedia elements such as images, videos, audio, and navigation that aim to improve student understanding through better interaction with learning materials. Several studies related to the development of e-modules for vocational high school students (Al Hanif & Santosa, 2023; Fahrurrozi et al., 2023; Rahmagandi et al., 2024). However, no specific interactive e-modules have been developed for body measurement and blouse pattern-making material. Therefore, this study aims to address the identified gap by developing e-modules.

Preliminary study by the author at Public Vocational School 5 Malang in February 2025, it was found that students had several difficulties, such as obstacles in understanding the material and printed modules in the form of handout books regarding the steps for measuring the body correctly, as well as difficulties in understanding the steps for making basic patterns for blouse patterns. So based on the results of the observation, it was found that the limitations of learning using conventional modules,

namely learning media in the form of handout books, were considered less effective, so students did not understand the correct body measurement material and did not make basic patterns for blouses correctly.

To adressing explained above, the formulation of the problem of this study is "1. How is the feasibility of a digital-based interactive e-module on the material of body measurement and blouse pattern making? 2. What are the students' responses to the digital-based interactive e-module on body measurement and blouse pattern making? The study has specific objectives. 1. To determine the feasibility of a digital-based interactive e-module on the material of body measurement and blouse pattern making 2. To determine students' responses to the digital-based interactive e-module on the material of body measurement and blouse pattern making.

## 2. METHOD

The development method used by the researcher refers to the ADDIE (Analyze, Design, Development, Implementation, and Evaluation) model for development research. We chose this model due to its frequent use in instructional development. This research on learning media will be developed with the aim of creating a digital-based interactive e-module that contains learning materials on body measurements and blouse pattern making. This decision is supported by the statement of Martatiyana et al. (2023), who argues that ADDIE is a model that is simple to use and can be applied in a curriculum that teaches knowledge, skills, and attitudes. The reason for choosing the ADDIE method is because this model provides the opportunity to continuously evaluate and revise in each phase that is passed until the right results are found. This process ensures that the products obtained will be valid and reliable. Additionally, the ADDIE model features straightforward procedures, while its implementation yields systematic results. Branch and Varank (2009) and Spatioti et al. (2022) outlines the development process using the ADDIE model, which serves as a guide for designing a learning system, as shown in Figure 1.

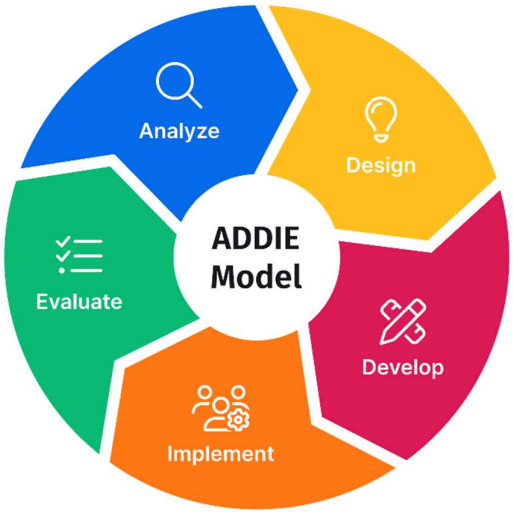


**Figure 1.** ADDIE Scheme

We conducted this research in class X Fashion Design and Production at Public Vocational School 5 Malang. The subjects in this study were all 27 class X students. Mulyasari & Doly (2023) explain the stages of ADDIE model development in more detail, as follows:

*Analyze*

At this stage, the activities involve analyzing students' characteristics and their needs regarding teaching materials, as well as assessing the urgency of developing digital-based interactive e-modules. The purpose of this analysis is to assess the significance of developing this interactive e-module for learning activities. In addition, we will prepare the references and materials to be taught in the interactive e-module at this stage. Based on observations made in February 2024, the character analysis of class X phase E students at Public Vocational School 5 Malang shows that they are Generation Z, who prefer learning through visuals and interactive methods and like to learn on their own using flexible materials that can be accessed from anywhere. In addition, students have low learning motivation with the learning media currently used. Analysis of student needs obtained from observation results refers to the analysis of student character, so students need learning media that can improve the quality of learning, learning achievement, and student learning motivation. Thus, researchers developed interactive digital-based e-module learning media, which is considered to eliminate student boredom in learning.

*Design*

The second stage is design or designing; the steps to design this media begin with planning the content of the material and designing the appearance of the media to be developed, but a detailed storyboard needs to be made; its function is to facilitate the development process (Ghofur & Youhanita, 2020). At this stage, it's also crucial to identify the software for the development process. Once you implement the learning media, you must also create tools for the validity test and for students.

*Development*

The development stage involves transforming the design into an interactive media product, specifically a digital-based interactive e-module. The following applications will be used to make this interactive e-module: 1) Canva to create the e-module design and edit the contents of the material. 2) The Heyzine website will be used to transform the design into an interactive e-module. After the interactive e-module has been developed, validation is carried out by 2 validators consisting of 1 media expert and 1 material expert who aim to find out the expert's response to the feasibility and attractiveness of the digital-based interactive e-module. The interactive media developed can be declared valid if the results of the validation assessment have reached the valid category and are in accordance with the validation criteria that have been set. However, if the results are not valid, revisions need to be made according to the suggestions and input from the validator; this is done to perfect the weaknesses of the digital-based interactive e-module.

*Implement*

This stage involves implementing digital-based interactive e-module products in the learning process for students at school. We aim to ascertain how students react to the appeal and comprehension of the content within the digital-based interactive e-module. The subjects of this study are students from class X, phase E, at Public Vocational School 5 Malang, specializing in Fashion Design and Production. The sampling technique used is random sampling; the population in this study is less than 100, namely 27, so all populations are used as samples.

*Evaluation*

This study divides evaluation into two categories: formative evaluation and summative evaluation. Formative evaluation is an evaluation carried out at each stage to repeat each stage if necessary to improve the development of interactive e-modules. Summative evaluation is an evaluation carried out at the end of development to determine the feasibility of the product being developed to improve the competencies possessed by students (Wicaksana et al., 2019).

Data analysis is an activity after all data is collected from respondents or other data sources. Statistical tests are carried out to change quantitative data into data that can be interpreted descriptively to determine the feasibility of digital-based interactive e-modules. The percentage score identifies the feasibility level of research and development product results. The higher the score, the better the level of feasibility of the development product. The criteria for decision-making in media validation and materials are presented in Table 1.

**Table 1.** Interactive E-Module Eligibility Criteria

| Percentage | Qualification | Interpretation |
|---|---|---|
| 81% - 100% | Very Eligible | Very eligible, very effective, very complete, can be used without improvement |
| 61% - 80% | Fairly Eligible | Quite eligible, quite effective, quite complete, can be used but needs improvement |
| 41% - 60% | Less Eligible | Less eligible, less effective, less complete, needs major improvement, recommended not to be used |
| 21% - 40% | Not Eligible | Not eligible, ineffective, not complete, cannot be used |

## 3. RESULTS AND DISCUSSION

### Results

The study is to assess the viability of introducing a digital interactive e-module focused on body measurement and blouse design creation at a public vocational

institution. The study also seeks to assess students' reactions to the digital interactive e-module focused on body measuring and blouse pattern creation. The ADDIE development model helps create digital interactive e-modules about body measurement and blouse pattern-making, which includes five steps: analysis, design, development, implementation, and evaluation. Based on the research and development that has been carried out, the following research results were obtained:

**The feasibility of digital-based interactive e-modules for body measurement and blouse pattern-making materials**

Material experts evaluated and assessed the feasibility of the materials used in developing this digital-based interactive media. The validation done by these material experts is to determine if the materials in the digital-based interactive e-module meet the set standards and to gather feedback for improving the developed media. The material validation results are 89.5%, which is in the very feasible category, meaning it can be used without improvement.

We refer to the assessment and evaluation of the design and features in this digital-based interactive e-module as media expert validation. The purpose of this media expert validation is to find out whether the design and features in this digital-based interactive e-module are in accordance with the predetermined indicators, as well as suggestions and input for media improvement. The results of the media expert validation in this study were obtained with a percentage of 90.7% included in the "very feasible" category with the interpretation of "very feasible," "very effective," "very complete," and "can be used without improvement."

Building upon the validation results from the two validators, this digital-based interactive e-module is declared feasible and can be used in research to make it easier for students to understand learning materials.

**Student response to digital-based interactive e-modules on body measurement and blouse pattern-making materials**

After the interactive e-module was declared feasible for use, the implementation of the digital-based interactive e-module was carried out with Class X Fashion Design and Production students at Public Vocational School 5 Malang. This implementation activity was to obtain student responses to determine the practicality of the digital-based interactive e-module. A total of 27 students from class X Fashion Design and Production at Public Vocational School 5 Malang completed the response questionnaire after participating in learning with the digital-based interactive e-module.

The questionnaire results from student responses showed a percentage of 83.6%, categorized as "Very Good"; this outcome indicates that the interactive e-module is highly practical for students in class X Fashion Design and Production.

**Discussion**

The following explanation comes from the results of the feasibility study and student feedback on the digital interactive e-module about body measurement and blouse pattern-making created by the authors:

The validation results from material and media experts confirm the feasibility of interactive e-modules.

*Material experts*

The results indicate that the materials are feasible, as they received a very high feasibility value; this aligns with Saadah's (2017) assertion that educational media should be selected based on several considerations, including the relevance of content and its alignment with curriculum objectives. In addition, according to Hamid et al. (2017), the material in learning media needs to be presented in accordance with the developing curriculum; in addition, there needs to be novelty.

*Media experts*

The results of this study indicate that the interactive e-module on body measurement and blouse pattern making at a public vocational school meets the valid criteria by media experts. The feasibility of digital-based interactive e-modules depends on the inclusion of images, photos, and graphics, as supported by previous research. Clark & Mayer (2023) states that media incorporating images, photos, and graphics will accurately illustrate the process of occurring events. Destiana et al. (2024), states that effective media must possess artistic and aesthetic value to engage students' interest in learning.

Student response questionnaire

The response of Class X students of Fashion Design and Production at Public Vocational School 5 Malang to the e-module was excellent, both in terms of ease, motivation, and attractiveness. Students felt that the material was very appropriate for their learning needs in the field of blouse pattern making. In general, students were interested, optimistic, and satisfied with the use of this e-module. This aligns with the opinion of Rahmatunisa et al. (2022), which states that student acceptance of e-modules will be low if students are not interested. Additionally, e-modules can serve as supplementary resources to enhance learning beyond the confines of traditional class hours (Fitriana et al., 2024; Wulansari et al., 2024).

The implication of this study suggests that the interactive e-module produced for body measurement and blouse pattern making can serve as an auxiliary learning medium that is interactive, dynamic, and animated. We aim to guarantee student involvement and streamline their understanding of body measurement and blouse design creation through a methodical and user-friendly approach.

The study results indicate that students perceive the interactive e-module on body measurement and blouse pattern making as a tool that enhances their engagement in the learning process and can serve as supplementary media in vocational education going forward.

## 4. CONCLUSION

The conclusion of this research is that, based on the validation results from the two validators, this digital-based interactive e-module is declared feasible and can be used in research to make it easier for students to understand learning materials. The student response questionnaire yielded a percentage of 83.6%, which falls under the "excellent" criteria; thus, the interactive e-module is considered very practical for use by students in class X Fashion Design and Production at Public Vocational School 5 Malang.

As a suggestion, this e-module can be used as a reference for teachers to improve the learning process, especially for students, and it can serve as supplementary media in vocational education going forward. Further research indicates that developing interactive media on additional topics with a broader scope is recommended.

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