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Development of a Spunbond Miniature Dress Form as a Three-Dimensional Presentation Medium in Vocational Education

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Abstract
This study aims to determine the effectiveness of a miniature dress form made from spunbond material as a three-dimensional presentation medium. This research is a Research and Development (R&D) study employing the ADDIE model with a quantitative descriptive method and approach. The study involved 66 participants divided into two groups: 6 validators and 60 respondents (10 in the small group and 50 in the large group). The research results of the spunbond miniature dress form as a three-dimensional presentation medium obtained a high-category average score of 96.92. This indicates that the spunbond miniature dress form is effective as a presentation medium based on the indicators of quality, composition, and effectiveness.

Keywords: *dress form, presentation medium, spunbond material, vocational education*

INTRODUCTION

Vocational education is a skills-based education that prepares students to enter the workforce upon completing their studies. It is an educational model that emphasizes a composition of 60%–70% practical work and 30%–40% theoretical study, with the expectation of addressing the challenge of preparing university graduates with applied skills required by the job market. This implies that the methods utilized in the teaching and learning process must be adapted to actual working conditions, with expected outcomes aligning with the demands of the labor market (Widowati, 2023). The mastery of skills in vocational education needs to be supported by comprehensive facilities and infrastructure to strengthen these competencies. In this regard, the learning process in vocational education must utilize various instructional methods and media to contribute to the enhancement of learning quality, in accordance with the demands of the workplace and industry.

The use of media for instructional purposes as a teaching aid is an effort to present concrete experiences through visualization, aiming to introduce, enrich, or clarify abstract concepts and encourage further activities. Therefore, it is essential to design instructional media systematically to convey information and build interactions that can improve the communication skills required in the workplace. Communication skills in vocational education can be cultivated through presentations in every learning activity, particularly in conveying ideas and concepts related to students' work. Effective communication skills assist students in job interviews and other vocational training activities. Speaking and communication skills have been ranked above motivation, work experience, and academic credentials (Mahdi, 2022). There are several types of instructional media that can be applied to support learning presentations, namely: (1) graphic media, (2) photographic media, (3) three-dimensional media (solid models, cross-sectional models, layered models, working models, mock-ups, and dioramas), (4) projection media, and (5) audio media and the environment as instructional media. These media range from simple to complex forms, such as realia, models, texts, visuals, audio, video, and multimedia (Yaumi, 2018). Following the characteristics of fashion design vocational education,

three-dimensional media in the form of models are considered appropriate to support pattern-making learning. Models are used as information mediums to explain the concepts of a process, system, or learning object in a simple, clear, and engaging manner (Yaumi, 2018). The three-dimensional medium to be developed is a miniature dress form. This is based on observations during the learning process, which indicated a limited number of dress forms, requiring them to be used alternately or shared between two students. The high cost of dress forms makes them unaffordable for all students, and their large shape and size make them difficult to transport easily. This condition leads to suboptimal student presentations of their work and results in a less effective and efficient learning process execution.

A dress form or sewing mannequin is a model or simple replica displaying a real object (a model or sample), created or assembled by humans as a representation of the original object. This medium can be constructed in the same size, smaller, or larger than the original object, either fully detailed or in a simplified form according to learning needs (Smaldino et al., 2019; Yaumi, 2018). Dress forms can be used for pattern making (for three-dimensional cutting), sample testing (seam accuracy), pattern checking, display, teaching, and learning (Hyun & Boo-Ja, 2006; Y.-R. Lee & Jang, 2019). The dress form serves as a fundamental basis for garment pattern making, which is highly crucial in the apparel industry (S. Lee & Kwon, 2020). In accordance with its function, a dress form is shaped like a torso or a full body corresponding to the human body in various sizes for men's, women's, and children's clothing, generally utilizing standard measurements (S, M, L). Generally, the manufacturing materials for dress forms use cotton, linen, or rayon as the outer layer; however, this does not indicate the materials used for the filling and inner lining (Y.-R. Lee & Jang, 2019).

Based on the aforementioned factors, this study will develop a dress form using spunbond material. Spunbond is a textile technology product, specifically a non-woven fabric made from polypropylene, used for various purposes such as bags, blankets, and more. The processing of non-woven fabrics is significantly cheaper because they are made from irregular fibers bound through chemical bonding, localized thermal fusion, or mechanical entanglement (Abdel-Mouttalib et al., 2024). Spunbond is widely used due to its low cost and reliable strength (Mouradian, 2022). Thus, it is highly feasible that spunbond material is also suitable for fabricating miniature dress forms as three-dimensional presentation media. The presentations conducted by fashion design vocational education students are expected to impart influence or information to lecturers and the public regarding their work. Besides assisting the garment pattern-making process, dress forms are also used to display or exhibit sewn garments or garments created through draping. The approach used in this study is a quantitative approach. Quantitative research is systematic, planned, and structured, clearly defined from the beginning to the end of the study execution. The research type employed is Research and Development (R&D) with a quantitative descriptive approach. Development is the process of translating design specifications into a physical form. The meaning of development focuses on three aspects: (1) the development product; (2) systemic and systematic procedures, stages, or hierarchies; and (3) its relationship with models. Development activities are based on several fundamental reasons, namely continuing an existing product form, modifying or altering it, combining essential elements, or creating a new product (Yaumi, 2018). This research involves the systematic design, production, and evaluation of a product to ensure its effectiveness (Widowati et al., 2025).

METHODS

The selected procedural model adopted the ADDIE research and development model. According to Branch (2009), ADDIE stands for Analyze, Design, Develop, Implement, and Evaluate. ADDIE is a product development concept applied to build performance-based learning. The steps of the ADDIE development model in this study were as follows, Analyze Phase was utilized to gather general information such as curricula, learning outcomes, and infrastructure, as well as to review various literature and reference books supported by observation results, interviews with lecturers, and Q&A sessions with students. Analysis relates to activities associated with work situations and environments so that the necessary product to be developed can be identified (Sugiyono, 2016). Based on this, the research proceeded with analyzing the development of evaluation instruments, feasibility analysis, and development requirements. This study utilized questionnaires as a data collection tool. Design Phase based on the results of the previous analysis, a work plan was created to define the product overview to be generated at the final stage of development, and the design of the instruments to be developed was initiated. The steps taken included: a) Determining the Development Team

(experts playing a crucial role in the product development process), consisting of 6 product validation experts: 2 designers, 2 boutique owners, and 2 tailors. For the small group, there were 10 fashion design student respondents; b) Compiling a Development Schedule; c) Creating a Concept Map. At this stage, the initial media design and material selection for the product were also carried out. The three-dimensional dress form medium for the dress form pattern was fabricated using a standard size M pattern.

Develop Phase is the product realization stage, encompassing product manufacturing and testing activities (Sugiyono, 2016). The development was carried out according to the design, where researchers developed a miniature dress form using spunbond material. The product was developed based on suggestions provided or validated by experts. After the product was revised according to the validation experts' recommendations, it proceeded to formative evaluation, a process of collecting data used to revise the developed product prior to implementation or application in the learning process. The step taken was a small-group trial involving 10 students. Implement Phase tested product was applied in a real-world situation to a large group consisting of 50 fashion design students. This stage aimed to determine the responses to the use of the spunbond miniature dress form. Evaluate Phase is the activity of assessing whether every step of the activity and the created product are in accordance with the specifications (Sugiyono, 2016). To determine the effectiveness of the spunbond miniature dress form, a questionnaire containing student responses to the use of the developed product was utilized. The distributed student response questionnaires were subjected to a descriptive percentage statistical test using the criteria presented in Table 1.

Table 1. Descriptive percentage criteria

Interval	Category
76%-100%	High
56%-75%	Moderate
< 50%	Low

Tabel 2. Hasil akhir

Indicator	Result	Criterion
Quality	96,63	High
Composition	97,25	High
Effectiveness	96,88	High
Average	96,92	High

RESULTS AND DISCUSSION

This study employed the ADDIE development model, a five-stage research framework consisting of analysis, design, development, implementation, and evaluation. The analysis phase was conducted by interviewing fashion design students to ascertain the need for skill-supporting media that they could affordably own. Findings from this stage informed the three-dimensional dress form medium, which was developed using spunbond material at a 1:2 scale. The subsequent development phase involved the fabrication of the three-dimensional dress form medium product through a trial process, followed by validation with a small group consisting of ten respondents and product evaluation by 2 designers, 2 boutique owners, and 2 tailors. The implementation phase was carried out after the product was declared feasible, where the generated three-dimensional dress form medium became the subject of a large-scale evaluation study involving 50 participants.

The final stage of this research and development was the evaluation phase. The findings from this evaluation phase were based on the obtained data results, including the evaluation and assessment results of the spunbond three-dimensional dress form medium, which demonstrated a high average score across the indicators of quality, composition, and effectiveness. These findings align with the research by Hyun & Boo-Ja (2006), stating that a dress form is a three-dimensional model of the human body used to fit garments being designed, available in various shapes and sizes. Since dress forms used for university classes are mostly consumed by students, they must be produced at a low cost (Y.-R. Lee & Jang, 2019). The selection of spunbond as the material for fabricating the miniature dress form was based on Mouradian's (2022) research, which stated that spunbond fabric is widely used due to its low cost and reliable strength. It can be used in various applications such as medical gowns, disposable diapers, masks, agricultural fabrics, construction sheeting, automotive fabrics,

filtration, hygiene products, geotextiles, surgical drapes, artificial cartilage, industrial and cosmetic wipes, and protective clothing (Mouradian, 2022). These two factors supported its high effectiveness score.

CONCLUSION

The results and discussion regarding the development of a spunbond miniature dress form as a three-dimensional presentation medium in vocational education were conducted in accordance with the ADDIE research and development stages, namely analysis, design, development, implementation, and evaluation. Based on the obtained average scores, it was demonstrated that the spunbond miniature dress form achieved a high score as a three-dimensional presentation medium.

DECLARATION OF GENERATIVE AI

The authors declare that no generative AI or AI-assisted technologies were used in the writing process of this manuscript.

CONFLICTING INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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