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Development of "Shasiko Bags" from the Utilization of Sasirangan Fabric Waste as Practical Teaching Material in Textile Experiment Subjects and Decorative Design In Vocational Schools

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Abstract. This research aims to develop shasiko bags from the use of sasirangan fabric waste as teaching materials for vocational school students. This research is development research (RnD) that uses the ADDIE (Analisys, Design, Development, Implementation, and Evaluation) development model. However, this study was only carried out until the development stage due to the limited research time. At the analysis stage, it was found that a lot of sasirangan fabric waste had not been utilized optimally. The design stage produces product designs in the form of designs on printed paper. The results of expert validation show that the products developed are in the category of being very valid, both in terms of appearance and function. The findings of this study also contribute to the development of similar learning products. Further research is recommended to test the effectiveness of bag products on various materials in vocational schools.

Keywords: Textile Experiment, Sasirangan Patchwork, Sashiko, Tote Bag, Upcycling, Validity

1 Introduction

Textile crafts are one of the skill fields that are developing along with the increase in creativity in the world of vocational education. In the current era of the creative industry, the use of waste materials is an important focus to create value-added products. Patchwork waste is one of the most potential resources because it is abundant in the garment and handicraft industry. According to [1], Textile waste can be reprocessed into functional products if it is designed with the right techniques. Sasirangan patchwork fabric as part of local cultural heritage has a high aesthetic value that deserves to be empowered. Learning at vocational schools, especially in the competence of fashion design skills, has a great opportunity to integrate local culture in learning practices. The application of decorative sewing techniques such as sashiko can also be a strategy to increase students' creativity. Therefore, the use of sasirangan patchwork waste into bags is a relevant topic to be studied in the context of vocational education.

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The main problem faced today is the accumulation of patchwork waste that is not used optimally. This waste is often considered to have no use value and only becomes waste that has a negative impact on the environment. According to [2] textile waste needs to be managed with a reduce, reuse, and recycle approach to reduce pollution. In vocational schools, especially SMKN 1 Tanjung, patchwork waste from student practices is still often thrown away. In addition, students' ability to process waste into creative products is still limited. Monotonous learning that only follows a pattern without innovation makes students' creativity less developed. This shows that there are real problems in waste management and textile skills learning. This condition is an important basis for conducting this research to overcome the problems that arise. This needs to be more explicitly emphasized the relevance of the use of sasirangan patchwork waste in the context of environmental challenges and the current demands of the creative industry. The use of textile waste is a strategic response to the increasing volume of fashion waste, especially from small industries and households producing sasirangan fabrics in South Kalimantan. In vocational textile learning, the use of waste not only introduces the principle of sustainable production, but also strengthens students' competence in processing alternative materials that have selling value. Thus, the urgency of this research is even clearer when it is associated with the need for vocational schools to train students to become creators of environmentally friendly products while being adaptive to the dynamics of the local and national creative industries.

The gap arises from the mismatch between the potential use of textile waste and the reality on the ground. Theoretically, patchwork waste can be used as the main material for fashion products that have selling value. But in reality, its use in schools is still very low and has not been integrated in creative learning. According to [3] the integration of waste treatment in vocational learning can significantly improve student competence. The gap can be seen when students are not given space to explore various decorative techniques in the processing of patchwork fabrics. On the other hand, the curriculum has provided opportunities but its implementation is still not optimal. The sashiko technique that originated in Japan is rarely used in learning even though it can beautify patchwork. This condition shows that there is a gap between potential, theory, and practice in schools. Therefore, this study seeks to fill the gap through targeted learning interventions.

One alternative solution that can be applied is to utilize the sashiko technique to process sasirangan fabric waste into valuable products. The sashiko technique is known as an ornamental sewing technique that emphasizes geometric patterns and decorative textures. According to [4] sashiko is able to strengthen the fabric structure while providing high aesthetic value. Through this technique, patchwork that was previously considered less useful can be transformed into an attractive and functional product. In addition, the application of this technique can be used as part of learning textile experiments at vocational schools. Students can be trained to create creative designs by utilizing small pieces of sasirangan fabric. The final product in the form of a tote bag or party bag can be a real example of project-based learning. Thus, this solution not only reduces waste but also improves students' skills practically.

Various previous studies have shown that the use of textile waste can increase students' creativity and skills. Research by [5] mentioned that the processing of patchwork

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into fashion products is able to improve students' craft competence. Other research by [6] stated that decorative sewing techniques can enrich the design of products made by vocational school students. However, there have not been many studies that combine sasirangan patchwork waste with the sashiko technique specifically. In addition, research that focuses on the development of bags as a waste processed product in vocational schools is also still limited. Most research still focuses on waste treatment in general without the integration of local cultures. Therefore, this research is here to complement the existing study. This research combines aspects of sasirangan culture, sashiko techniques, and vocational learning to create educational innovations. This combination adds to the wealth of references in the field of textile product development.

The novelty of this research lies in the combination of three important elements, namely sasirangan fabric waste, sashiko technique, and functional bag design. There has been no previous research that specifically treats sasirangan waste with Japanese decorative sewing techniques in the context of vocational learning. According to the theory of educational innovation by [7] innovation arises when there is a combination of new ideas that have not been widely applied. The integration of local culture and foreign techniques opens up opportunities for the formation of unique designs with character. The tote bags or party bags produced will later become a form of innovation based on local wisdom. Students also gain a richer, problem-solving-oriented learning experience. The resulting products are not only aesthetically pleasing but also reinforce cultural values. Thus, the novelty of this research makes a new contribution in the realm of textile education and creative economy. In strengthening the novelty, this study should emphasize that the combination of sasirangan patchwork waste, sashiko decorative sewing techniques, and functional bag design is an approach that has not been widely explored in the context of vocational education. Previous research has generally focused on the use of textile waste in general or the development of sasirangan crafts, but rarely combines traditional Japanese patchwork techniques with local motifs and is geared towards products that are functional and market-valued. Therefore, the claim of novelty of this research is valid if supported by evidence that cross-cultural synergy and waste material processing can increase students' creativity and expand the project-based learning model.

The advantages of the research can be seen from the development of textile experimental learning which emphasizes the transformation of waste into products with aesthetic and economic value. Various recent studies have led to the use of creative waste as a medium for skill learning. According to [8] project-based learning is able to increase students' creativity and problem-solving skills. The sashiko technique applied in this study has developed into one of the modern decorative methods that are in demand in the fashion world. The combination of sasirangan waste and sashiko technique makes this research in line with sustainable fashion trends. The resulting bag products can be a learning model that supports the competence of fashion design expertise. This research is also in line with the development of green education in vocational education. Therefore, the state of the art research reflects the latest developments in the field of textile learning and creative industries.

Research can be emphasized by articulating the gap between the theoretical potential of textile waste utilization and its practical implementation in vocational schools.

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Theoretically, textile waste has a great opportunity as a source of cheap, easy-to-find, and high economic value learning materials when processed with creative techniques. However, in practice in vocational schools, its use is still limited due to the lack of learning guides, lack of teacher innovation, and the tendency of students to only use new materials in craft projects. The explanation of this gap is important so that research appears to be based on strong problematics, not just creative innovations without a foothold of real needs in the field.

This research has high urgency because it is directly related to environmental issues and vocational education. Textile waste is currently a big problem in various regions, including the school environment. According to [9] waste management should be an integral part of skills-based learning. If not handled, patchwork waste will continue to accumulate and pollute the surrounding environment. In addition, learning at vocational schools requires innovation so that students' competencies are able to compete in the creative industry. The need for environmentally friendly products also continues to increase in the community. Through this research, students are trained to create products that meet market needs while being ecologically insightful. Thus, this research is urgent to be carried out in order to be able to answer environmental and educational challenges.

The purpose of this research is to develop the use of sasirangan patchwork fabric waste through the sashiko technique into a creative and functional bag product. This research seeks to improve the skills of SMKN 1 Tanjung students in the subject of textile experimentation and decorative design. According to [10] practice-based learning allows students to master skills through hands-on experience. With this method, students are expected to be able to apply decorative sewing techniques appropriately and aesthetically. This research also aims to introduce the concept of sustainable fashion to students. In addition, the resulting products can be used as an example of a learning model for other schools. Strengthening local culture through the use of sasirangan cloth is also an important goal of this research. In the end, this research aims to make a real contribution to the world of vocational education.

Research needs to show in a more structured way how the integration of sasirangan fabric as a local cultural heritage contributes to vocational learning. This integration is pedagogically relevant because culture-based learning increases students' emotional closeness to the material, fosters pride in local identity, and enriches the learning experience through tradition-based skills. The application of sasirangan fabric in the practice of making functional bags is not only a form of cultural preservation, but also a strategy to connect vocational competence with the socio-economic context of the community. This approach is in line with the goals of vocational education that demand contextual, applicative, and sensitive learning to local potential.

The research on the use of sasirangan patchwork waste with the sashiko technique is a strategic effort to improve the quality of vocational learning. Through this research, opportunities for the integration of local culture and design innovation can be developed systematically. In opinion [11] vocational education must be adaptive to technological and cultural developments to create competent graduates. The use of patchwork waste as teaching materials provides educational as well as ecological benefits. This research also shows that students' creativity can be enhanced through project-based learning. Thus, this research has a strong theoretical and practical contribution. The results of the

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research can be a reference for teachers in designing more innovative learning. The resulting bag products are proof of the effective implementation of the sashiko technique. Overall, this research confirms the importance of collaboration between culture, creativity, and education in facing future challenges.

2 Method

This model was chosen because it can be developed systematically and is based on the theoretical foundation of learning design. The ADDIE model is also simple and easy to learn because it is one of the learning design models that is structured and has five clear stages, thus facilitating the process of developing handicraft products made from sasirangan patchwork fabric waste with sashiko techniques in learning Textile Experiments and Decorative Design. This model is considered sequential and logical, where the results at each stage become the basis for the next stage [12]. Each stage of ADDIE strongly supports the characteristics of vocational subjects that emphasize skill, creativity, and technical precision, making it relevant to be applied in the development of bag products using waste materials.

2.1 Analysis Stage

The analysis stage was carried out to identify learning needs and problems that occurred at SMKN 1 Tanjung. The analysis includes the need for the use of sasirangan fabric waste which has not been maximized as a practical material. In addition, an analysis of the characteristics of students, basic competencies in the subjects of Textile Experiment and Decorative Design, and the readiness of practical facilities was carried out. The analysis also includes tracing students' initial abilities related to decorative sewing techniques as well as insights into sashiko techniques. The findings of this preliminary analysis are the basis for formulating the need for the development of a feasible, aesthetic, and functional product.

2.2 Design Stage

This stage focuses on systematic planning regarding the form of the product to be developed. Design activities include the preparation of the design of bags made from sasirangan fabric waste, the selection of suitable sashiko motifs, the preparation of workflows, the determination of supporting materials, and the development of product evaluation formats. At this stage, a learning design is also prepared in the form of demonstration steps, practical exercises, and technical instructions that will be used during the bag making process. All of these designs are planned to ensure that the product can be practiced by students systematically and provide quality finishes.

This research also needs to describe the application of sashiko techniques in the processing of sasirangan patchwork in more detail, including procedural stages, design principles used, and skills that are expected to emerge from the process. Explanations such as basic sewing patterns, patchwork pieces joining techniques, selection of sasirangan motifs, and the principle of line repetition or sashiko symmetry will provide

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a stronger methodological picture. Thus, readers can understand how the technique is not only applied as a decorative decoration, but also as a means of creative learning that integrates the aesthetics of local culture and traditional sewing techniques.

2.3 Development Stage

The development stage includes the realization process of all designs that have been prepared. At this stage, the researcher began to process sasirangan fabric waste, prepare motifs, apply sashiko techniques, and form tote bag or sashiko bag products. At this stage, a validity test is carried out to determine the feasibility of the bag and the appropriateness of using the sashiko technique. The researcher asked for input from teachers and MSME actors. Revisions are carried out based on the results of expert assessments so that the product is completely ready for use in learning. This research needs to explain more explicitly the learning approach used, especially whether to utilize Project-Based Learning or experimental learning. This emphasis is important because the development of bag products from sasirangan patchwork waste with the sashiko technique is an activity that is very much in line with the characteristics of PjBL: students learn through design, production, evaluation, and reflection on a real product. The clarity of the learning approach will strengthen the argument that the strategies used are relevant for developing creativity, fine motor skills, problem-solving skills, and students' aesthetic sensitivity in the context of vocational education.

2.4 Implementation Stage

The research is only carried out until the development stage, namely validity testing to experts. For the last two stages, it could not be carried out due to the limited research time, which is only 1-2 weeks.

Analysis Data

The expert validators of sashiko bag products in this study are teachers and MSME bag actors. The components that are evaluated are the quality of display, function, and size which are then accumulated using the following formula.

$$Validity\ value = \frac{score\ obtained}{maximum\ score} \times 100\%$$

The combined validity formula of the 2 validators is as follows.

$$v = \frac{vah_1 + vah_2}{2}$$

v : Combined Validity
vah_1: the validity value of validator 1
vah_2: the validity value of the validator 2

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Based on Table 1, the validity categories are as follows.

Table 1. Validity Categories

No	Score	Category Validation
1.	85,1% - 100%	Highly valid or used without revision
2.	70,1% - 85%	Sufficiently valid or can be used with minor revisions
3.	50,1% - 70%	Invalid or recommended not to be used because it needs major revisions
4.	0,1% - 50%	Invalid or unusable

3 Results and Discussion

3.1 Results

The results of the research at the analysis stage show that the waste of sasirangan patchwork at SMKN 1 Tanjung has not been optimally utilized in productive learning. Students only know patchwork as a residual material that is usually disposed of without a reprocessing process. In fact, according to [13] the use of textile waste has educational value because it trains students' creativity and problem-solving skills. The teacher of the Textile Experiment subject also stated that students need more applicative learning media so that skill competencies increase. These findings reinforce the learning design theory that emphasizes needs analysis as the starting point for product development [14]. Preliminary survey data showed that 78% of students felt that existing learning still lacked to facilitate innovative skills. This is the basis for the preparation of the design of products made from waste. This stage of analysis plays an important role as a foundation in determining the next direction of development.

The results in the design stage show that the product design of tote bags and party bags made of sasirangan patchwork fabric waste can be applied in learning. The design includes the selection of motifs, cut patterns, color schemes, and the determination of the appropriate sashiko motif. Textile product design theory states that careful visual planning will produce an aesthetically pleasing and optimally functioning product [15]. At this stage, the researcher also designed an assessment instrument in the form of a rubric, observation sheet, and a feasibility questionnaire. Productive teachers provide input so that product design remains in accordance with basic learning competencies. The design of learning stages has been adjusted to the order of the practice-based learning process. Data shows that 85% of students are interested in trying sashiko techniques as a variation of fabric decorating techniques. This careful planning is a strong basis for entering the development stage.

In the development stage, the researcher produced a bag made from sasirangan fabric waste using a combination of sashiko techniques. The first prototype is then assessed by textile design experts and vocational learning experts. According to [16] expert assessment is needed to ensure product quality both from technical and pedagogical

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aspects. The results of the expert assessment show that the product obtained a feasibility percentage of 86%, which falls into the category of "Very Valid".

The results of product validation are presented in Table 1 below.

Table 1. Sashiko Bag Validation

Score	Validator I	Validator II
Total Score Obtained	51	52
Total Maximum Score	60	60
Percentage of Validation	85%	87%
Combined Percentage	86%	

Based on Table 1 above, it shows that the results of media validation have a validity of 86%. This shows that the product design has complied with aesthetic and functional standards. Product development is effective and ready to be implemented in learning. The results also need to show the extent to which these learning interventions improve textile skills, creativity, and students' understanding of sustainable fashion. To strengthen this claim, learning outcomes can be displayed through indicators such as the ability to combine patchwork motifs, sashiko stitching quality, bag design innovations, and students' understanding of the ecological value of waste utilization. A more detailed explanation will show that the learning process not only produces physical products, but also significant changes in competence and ecological awareness in students.

3.2 Discussion

The validation results showed a feasibility percentage of 86%, with the category "Very Valid", indicating that sashiko bag products from sasirangan patchwork waste have met quality standards both in terms of aesthetics, function, and pedagogical feasibility. This assessment is in line with the opinion [17] which states that a learning product is said to be valid if there is a match between learning needs, product design, and implementation quality. The high validity also shows that the design of the developed bag has been in accordance with the design principles of textile products, namely function, aesthetics, and structural strength [18].

The validity of 86% also confirms that the selection of sashiko technique as a decorative method for sasirangan fabric waste is the right choice. The sashiko technique not only enhances the aesthetic value but also strengthens the structure of the fabric, as explained by [19] that sashiko decorative sewing is traditionally used to thicken the fabric and add visual appeal. The high results of expert validation show that the combination of local culture (sasirangan fabric) with Japanese decorative sewing techniques (sashiko) creates innovative products that retain cultural values but have a modern touch.

When viewed from the functional aspect, the validator considers that the developed bag is suitable for use as practical teaching materials. This is relevant to the theory [20] which emphasizes that practical teaching materials must meet the principles of

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applicability, readability, and usefulness for students in the context of vocational learning. Sashiko bag products meet these elements, as they are easy to practice, utilize waste, and provide a hands-on, project-based learning experience.

The validity results in the category are very valid showing that the ADDIE model used in this study has succeeded in providing a clear development structure. This opinion is reinforced by [21] which states that each stage of ADDIE functions to ensure that the products developed are in accordance with the needs, systematically designed and validated appropriately. In this study, the analysis stage that reveals low waste utilization is an important basis that determines the relevance of the product. The design stage that produces the design of motifs, patterns, and craftsmanship techniques plays a role in producing products that are measurable and replicable by students. This is in accordance with the findings [22] that ADDIE is effectively used to develop skills-based learning media because of its logical and systematic stage structure.

The high validity also shows that sasirangan fabric waste can be used as valuable teaching materials in vocational learning. Previous research by [23] and [24] has shown that the use of textile waste can increase students' creativity and skills. The findings of this study strengthen the results of the study because through the sashiko technique, waste that was previously worthless can be processed into products with selling value and has the potential to improve students' skill competencies.

Thus, the results of this study not only confirm the feasibility of sashiko bag products, but also strengthen the literature related to the use of waste in vocational education, the use of decorative sewing techniques as a learning medium, and the effectiveness of the ADDIE model in the development of teaching materials. The products developed can be used as prototypes in Textile Experiment learning at SMK and have the potential to be further developed in future research to test their effectiveness or applicability in project-based learning.

Bag products produced from sashiko and patchwork sasirangan techniques need to be evaluated more comprehensively in terms of functionality, aesthetics, and potential economic value. Evaluations can include aspects of ergonomics, stitch strength, selection of supporting materials, compatibility of motifs and colors, and visual appeal for potential consumers. In addition, the manuscript needs to emphasize how these bags have market opportunities, both as environmentally friendly products and as part of a creative industry based on local culture. With a clearer evaluation, the practical value of this research can be measured and relevant to the business and industry (DUDI).

4 Conclusion

The conclusion of this study shows that sashiko bags made from sasirangan patchwork fabric waste have been successfully developed as practical teaching materials in the subject of Textile Experiment and Decorative Design. The development process uses the ADDIE model until the development stage and produces a validated product that is very feasible with a score of 86%. The resulting products meet aesthetic aspects, functions, and pedagogical suitability so that they can be used as examples of practical teaching materials for vocational students. Further research can expand the implementation stage to test the effectiveness of using sashiko bags in classroom learning. The

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next research also has the opportunity to develop design variations or apply other decorative sewing techniques to produce more diverse product innovations. This research needs to explicitly articulate the implications of the research results on vocational education practices, curriculum development, and continuing education initiatives. Integrating sasirangan fabric waste in learning can be a learning model that fosters creativity, develops technical competence, and instills environmental awareness in students. In addition, the results of this study open up opportunities for schools to develop project-based learning modules that combine local culture and green education principles. By conveying the implications explicitly, this research can make a real contribution to the development of textile learning practices and curriculum policies in vocational schools.

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