

Zero-Waste Application in Mini Dress Design: Utilizing Fabric Scraps as Aesthetic Accents

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Abstract

The fashion industry is one of the largest contributors to textile waste globally. One sustainable design approach that has emerged is zero waste fashion design, a strategy that minimizes waste from the initial design phase. This study aims to implement the zero waste concept in mini dress design by utilizing fabric scraps aesthetic accents. The method used is the Double Diamond Design Process, consisting of four phases: discover, define, develop, and deliver. The results show that fabric scraps can be creatively integrated into fashion design without compromising aesthetic value. The resulting mini dress design are not only efficient in material usage but also visually appealing and aligned with sustainability principles.

INTRODUCTION

Fashion is one of the largest contributors to textile waste in the world. According to a report by the United Nations Environment Program (UNEP, 2022), the industry generates about 20% of global wastewater and contributes 10% of global carbon emissions. One of the main causes is unutilized fabric scraps from the fashion production process. In the textile and fashion industry, there are two categories of waste, namely industrial waste and consumer waste. (Nursari et al., 2019) explained that pre-consumer waste from the clothing production process is one of the industrial wastes that receives little attention.

The pattern cutting process generates an average of 15% textile waste per garment. In 2015, the estimated amount of textile material used in clothing production was 400 billion meters. Since 2008, the zero waste concept has been applied in the textile and fashion industry to optimize material characteristic and availability, with pre-production waste reduced to less than 15%. (Rissanen, T., & McQuillan, H. 2023) in the approach, fabric scraps are not thrown away but

used as part of the fashion design. This research aims to apply the zero waste concepts by utilizing fabric scraps as aesthetic accents in mini dress design. Mini dress was chosen because of its simple shape and flexibility to be developed. It is hoped that the result of this research can contribute practice of sustainable fashion design that is not only functional but also has aesthetic value (Niinimäki, K, 2013). One of the most common form of waste generated from the production process is unused fabric scraps. Typically, these scraps are discarded even though they are still of usable quality. This phenomenon encourages the emergence of various design approaches that are more environmentally friendly, one of which is the concept of zero waste fashion design (Gupta, L., & Saini, 2020).

Zero waste fashion design is a fashion design method that aims to minimize or even eliminate textile waste from the early stages of the design process, especially from the patterns made (Rissanen, T, 2013). This approach requires to think strategically in drafting patterns, utilizing all parts of the fabric, and avoiding excess pieces.



However, the challenge is how to maintain the aesthetic aspect of the fashion design. In practice, the application of zero waste is still often constrained by limited creativity in processing the remaining materials into something that has high aesthetic value. (Athiva et al., 2024) therefore, this research tries to answer this challenge by exploring how to utilize fabric scraps as decorative accents in the design of mini dresses, a type of clothing that is popular among various groups, especially young people. (Maulidina & Nursari, 2019) also showed that the utilization of zero waste patterns can be applied various forms of clothing, including outerwear and dresses.

Mini dresses were chosen because of their concise, simple characteristic, but still provide room for design exploration, especially in the context of processing leftover materials. This research not only seeks to apply the principle of zero waste, but also place aesthetic values an important part of the sustainability solution. (ElShishtawy et al., 2022) the concept of zero waste fashion come as a solution to reduce these environmental impacts by optimizing the use of fabrics from the design stage. In the context, the remaining fabric is not thrown away but utilized as part of the fashion design elements. The mini dress was chosen as a medium of exploration because of its simple shape and flexibility to be developed (Roberts J, 2021)

METODE

Indarti (2020) This research to uses the Double Diamond Design Process method developed by the british design council. This method divides the design process into four main stages:

1. Discover
2. Define
3. Develop
4. Deliver

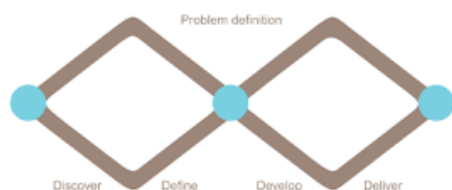


Figure 1. Double Diamond Design Process

Double diamond was chosen because it provides a systematic framework, from the problem exploration stage to the final design implementation. The application of this method allows the zero waste mini dress design process to be carried out effectively and structured.

Discover

At the beginning of the design process is the stage of finding ideas, inspiration, and identifying needs. In making a product, the design theme has a big influence in making the character of the clothes that will be realized at this stage, the design inspired by the concept zero waste, which as a minimum of 15% textile per outfit (Fatkharani & Surhatini, 2023).

Define

This stage is carried out by compiling a with moodboard with the theme "Urban Oasis" that combines elements of the city and nature, and compiling mini dress design sketches based on the theme. The design features the use of fabric scraps on the panel, asymmetrical cut lines, and mix of two colors.



Figure 2. Moodboard "Urban Oasis"

Develop

The process of analyzing the various sources that have been obtained, which are then developed. At this stage the design will be formed into a design based on the inspiration on the moodboard. Design development is made as many as 4 designs.



Figure 3. Design

Design sketches four mini dress design were created based on visual exploration of the moodboard. Each is characterized by the use of different fabric scraps, such as geometric cuts, contrasting color applications, and placement of additional fabric layers.

Deliver

In the deliver stage, experiment patterns using the concept of utilizing fabric scraps into aesthetic accents. The patterns used is rectangular using 120x100 cm fabric which is implemented in the four design developments.

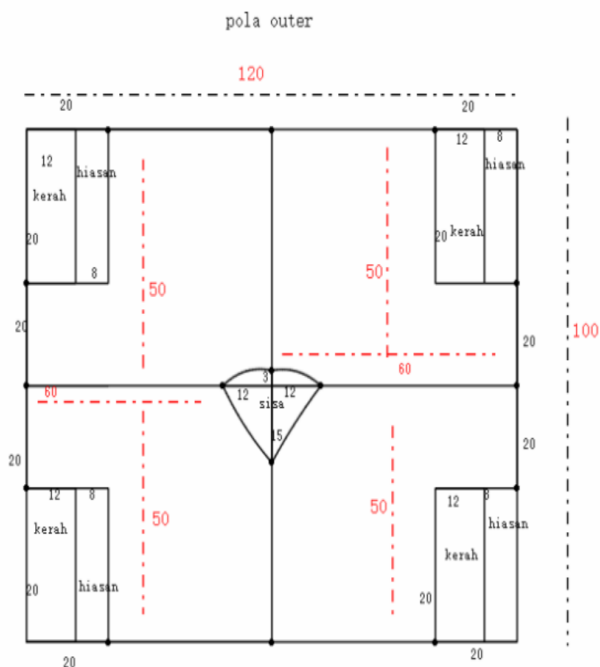


Figure 4. Zero waste outer patterns

The pattern is made in fabric size of 120 cmx100 cm. Each piece was drafted to minimize scraps.

Leftover areas are marked and redesigned into straps or accents.

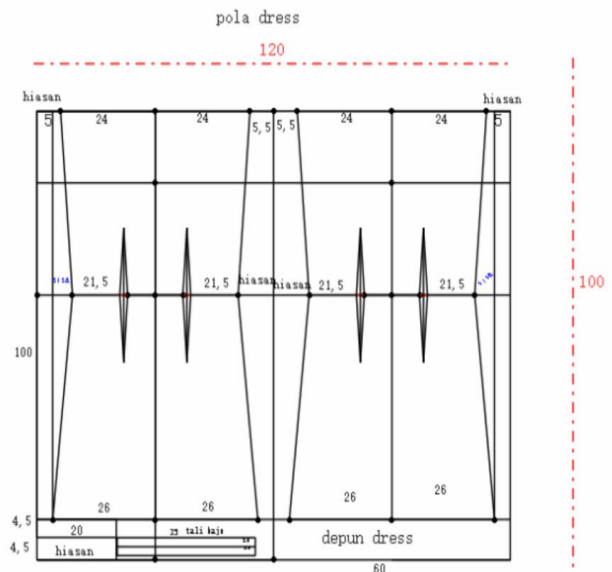


Figure 5. Mini dress pattern

Zero waste is made in fabric size 120 cmx 100 cm. Each piece is arranged to minimize scraps. Leftover areas are marked and redesigned into straps or accents.

RESULT AND DISCUSSION

Process & Result

The zero waste mini dress design process was successfully realized by optimizing 120 cmx 100 cm fabric using a rectangular pattern approach. The four designs in developed in the develop stage were then realized into one final product in deliver stage by utilizing the remaining fabric as an aesthetic accent. Each piece of was arranged so as not leave any wasted pieces, making this product in accordance with the principle of zero waste. The finished mini dress features a simple design but has strong character. Fabric scraps used to create decorative elements in the form accent layers on the shoulders and sides of the skirt, as well as straps to provide a variety of silhouettes. This technique not only maintains material efficiency but also enriches visual appearance with contrasting yet harmonious additional textures.

Aesthetically, the resulting garment fulfills the principles of fashion design in terms of proportion, balance and visual rhythm. The utilization of fabric scraps as part of design shows a creative approach in solving textile waste

issues. The additional accent from the leftover fabric gives an interesting visual value without being excessive, making the design look original and with character. From a technical perspective, the stitches on the clothes look neat and precise. The basic techniques of fashion construction are well applied despite the unconventional pattern used. The mini dress is still comfortable wear, flexible to follow the body shape, and does not reduce its basic function as ready- to- wear clothing. The application of the Double Diamond method proved effective in facilitating the process of exploration, development, and implementation of the design in a structured manner, starting from the search for inspiration, the preparation of sketches based on the “Urban Oasis” themed moodboard , to the realization of the design into a physical form that complies with the principles of sustainability. The success of this design shows that the concept of zero waste is not limitation, but an opportunity to develop innovative design ideas that have a positive impact on the environment. The resulting mini dress not only minimizes waste, but also serves as a tangible example that fabric scraps can be a key elements that enriches the aesthetic of clothing.

Product assessments results

The result of the product assessment were assessed by 20 D4 students of Surabaya state fashion management 4th semester, who had taken the zero waste course. Product assessment is band on 6 aspects, namely the suitability of the zero waste concept, utilization fabric scraps, aesthetic value of design, sewing the techniques and neatness, design innovation, function and comfort clothing.

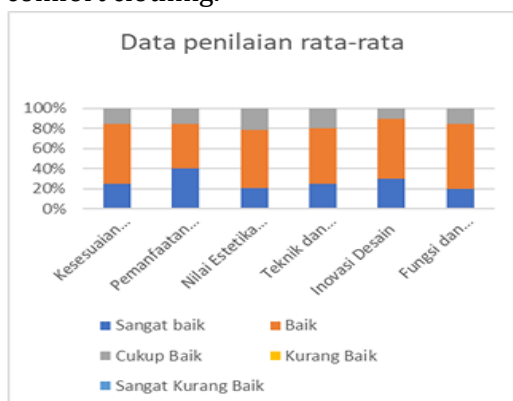


Figure 7. Product assessment result

Based on the figure it can be concluded that, questions regarding :

1. Conformity to the concept of zero waste : From the result of the average score that 4.00 that this product is “good” in conformity to the concept of zero waste. This indicated that the design and pattern successfully implemented the principle of minimizing waste effectively, in accordance with the main goal of zero waste fashion.

2. Utilization fabric scraps : From the results of the average score that 4.14 rated “good” on the utilization of fabric scraps. This shows that the leftover fabric was successfully applied creatively as an aesthetic accent without reducing the value of the garment, and was even able to enrich its visual appearance.

3. Design aesthetic value : From the results of the average score 3.90 rated “good” for design aesthetic. The indicates that the design has visual appeal.

4. Sewing technique and neatness : The average score of 3.95 rated “good”. This confirms that the clothing construction is done neatly and precisely.

5. Design innovation : The average score of 4.09 rated “good” on designs innovation. This shows that this mini dress designs is unique and update from the previous fashion design.

6. Fashion function and comfort : The aspect and function of clothing comfort received and average score of 3.95 rating “good”. This prove addition to being innovative and sustainable, this mini dress is also comfortable and functional to wear as ready-to-wear is clothing.

CONCLUSION

The application of zero waste in mini dress design allows for a significant reduction in textile waste while maintaining aesthetic value. The remaining fabric can be utilized as a decorative element that adds unique character design. This research contributes to the development of sustainable fashion design and opens a space for creative exploration in the utilization of production waste.

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