

E-BOOK OF EXTENDED ABSTRACT

THE 14TH INTERNATIONAL INVENTION, INNOVATION & DESIGN COMPETITION 2025



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DESIGN COMPETITION 2025

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MULTIFUNCTIONAL REVERSIBLE OUTERWEAR DESIGN

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ABSTRACT

The apparel overconsumption has impacted the lifespan of the garments, instead of being recycled or repurposed. This research explores the design and innovation of multifunctional outerwear that can transform into different types of clothing. This design aims to meet the growing demand for versatile, stylish, and practical clothing. This study focuses on enhancing outerwear functionality through reversible design elements and transformability, offering consumers greater flexibility and sustainability in wardrobe choices. The methodology integrates design experimentation with technical garment construction, employing a multifunctional clothing technique using several fastenings that enable seamless transitions between garment forms. Fabric selection and fastening placement were strategically analyzed to ensure aesthetic appeal and functional integrity. The reversible feature further amplifies the versatility of the outerwear, allowing multiple styling options from a single garment. This multifunctional design contributes to sustainable fashion by reducing the need for various garments and supporting conscious consumer behavior. The study contributes to sustainable fashion by demonstrating functional clothing that can be worn for different styles and occasions and is suitable for daily activities. It offers thoughtful design and innovative construction techniques that can lead to adaptable fashion solutions that align with modern lifestyle needs and environmental concerns.

Keyword: multifunctional, outerwear, design

1. INTRODUCTION

In the rapidly evolving fashion industry, there is an increasing demand for innovative garments that not only satisfy aesthetic preferences but also offer functional versatility (Ansari & Rane, 2025). With the growing awareness of sustainability and the need for conscious consumption, multifunctional clothing has gained significant attention among designers and consumers alike. One such area of innovation is outerwear, recognized as the most commonly worn clothing item in the daily wardrobe (de Wagenaar, Galama & Sijtsema, 2022), due to its adaptability and role as a layering piece suitable for various outfits and occasions. Outerwear serves both aesthetic and practical purposes, offering protection, warmth, and style, making it an ideal clothing type for multifunctional design exploration. Despite its popularity, traditional outerwear often lacks flexibility, offering limited styling options and encouraging consumers to purchase multiple pieces for different looks or functions. This contributes to excessive consumption and textile waste, counteracting sustainable fashion goals. The challenge lies in designing outerwear that maintains its stylistic appeal while adapting to different functions and forms, thereby increasing garment longevity and reducing the need for excessive wardrobe items (D'Itria & Vacca, 2024).

The main objectives of this research are to design and construct a versatile outerwear piece that incorporates transformability and reversibility and to evaluate the effectiveness of the multifunctional clothing technique in achieving functionality. This study aims to contribute to the advancement of functional fashion and inspire future innovations in sustainable clothing design.

2. METHODOLOGY

Quantitative research is a method to analyze the requirements that can be interpreted to understand the meaning and develop knowledge about multifunctional reversible outerwear. These include all the appropriate data collection instruments that are reliable for the research objectives. This approach enables the design preferences to offer functionality and usability to the outerwear design. The idea development process follows a structured sequence beginning with ideation through sketches and technical drawings. Next, the design undergoes experimentation into prototype making to address the feasibility, fit, comfort, and ease of transformation, the final design of multifunctional outerwear being developed with the integration of both functional versatility and sustainable design principles. The designs explored how a single outerwear piece could be transformed into a cape, vest, and skirt using invisible zippers and magnetic fastenings.

3. FINDINGS



Figure 1: Final Prototype

Integrating invisible zippers and magnetic fastenings proved highly effective in enabling seamless transformation between multiple garment forms. As shown in Figure 1, these fastening techniques maintained the garment's aesthetic appeal while ensuring ease of use and achieved different types of clothes. The design process highlighted the importance of functional versatility combined with sustainable principles. The study addresses contemporary demands for more responsible fashion consumption by focusing on creating a garment with multiple uses. The multifunctional outerwear encourages consumers to invest in fewer items without sacrificing variety or style, which has positive environmental implications by potentially reducing textile waste and resource use. Table 1 shows the design characteristics for the multifunctional outerwear that can be transformed into a cape vest and skirt. This is because outerwear can easily match any clothes suitable for daily activities. The reversible elements offer more variety to the wearer when using multifunctional outerwear.

Table 1: Design Characteristics

Multifunctional Outerwear	
Color	Black and White
Fabric	Reversible
Characteristics	Transform into a cape, a vest, and a skirt
Technique	Invisible zip and magnet

4. CONCLUSION

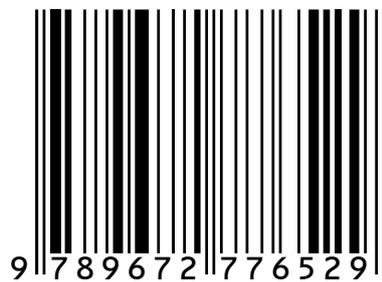
The development of multifunctional reversible outerwear represents a meaningful advancement in contemporary fashion design, blending functionality, versatility, and sustainability. This study has demonstrated that through innovative construction techniques, such as invisible zippers and magnetic fastenings. A single garment can be effectively transformed into multiple forms, including a cape, vest, and skirt. These design solutions enhance the usability and adaptability of outerwear and address the growing demand for garments that accommodate diverse lifestyles and changing environmental conditions. This study contributes to the field of fashion design by demonstrating a viable pathway to creating outerwear that is both multifunctional and sustainable. It offers practical solutions for transforming garments with minimal visual disruption, highlighting new possibilities in adaptive clothing design. Additionally, the research supports a shift toward more sustainable fashion consumption by promoting longer-lasting, versatile garments. Ultimately, the findings encourage designers and manufacturers to rethink traditional garment design, emphasizing innovation that balances aesthetics, function, and environmental responsibility.

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