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Sustainable Fashion: Evaluating Drape Characteristics and User Preferences of Upcycled Denim Skirts Constructed with Alternative Pattern Techniques

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Structured Abstract

Background: The fashion industry contributes significantly to environmental degradation, with denim production associated with excessive water consumption, chemical use, and textile waste generation. Upcycling post consumer denim has emerged as a sustainable strategy within the circular fashion framework; however, the inherent stiffness and structural irregularities of reclaimed denim present challenges in achieving satisfactory garment drape and aesthetic appeal. While pattern construction techniques are known to influence fabric behaviour, limited research has examined their impact on the drape performance of upcycled denim garments. This study aimed to evaluate how alternative patch construction techniques affect the drape characteristics of upcycled denim skirts and to investigate user preferences in relation to these drape properties.

Methods: The study was conducted in two phases integrating technical garment evaluation and user perception analysis. In Phase One, three upcycled A-line denim skirt prototypes were constructed using different pattern techniques: grid patchwork aligned on the straight grain, irregular asymmetrical patchwork with mixed grain directions, and bias-cut patch panels designed to enhance flexibility. Drape performance was assessed using drape coefficient testing, fold count observation, and photographic visual drape profile analysis. In Phase Two, a structured questionnaire survey involving 20 university students was administered to evaluate perceptions of drape quality, aesthetic appeal, comfort, and overall design preference.

Results: The findings indicated that pattern construction significantly influenced drape behaviour. The grid patchwork skirt recorded the highest drape coefficient and the lowest fold formation, reflecting increased stiffness. The asymmetrical patchwork design demonstrated moderate drape performance. The bias-cut patch panel skirt exhibited the lowest drape coefficient, highest fold count, and most fluid silhouette. User evaluation results aligned with the experimental findings, with the bias-cut design receiving the highest ratings for visual appeal, perceived comfort, and overall preference.

Conclusion: The study demonstrated that bias-oriented patch construction significantly improved the drape performance and aesthetic acceptance of upcycled denim skirts. Integrating technical drape evaluation with user perception provided practical design guidance for enhancing the functionality and marketability of sustainable upcycled denim garments.

Keywords: Upcycled Denim, Drape Behaviour, Patch Construction, Sustainable Fashion, Garment Design

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