Empowering Inclusive TVET through Experiential Upcycling: A Ghanaian Case Study on Textile Waste Reuse

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Abstract. This study explores how experiential learning can be harnessed through textile waste upcycling to promote sustainable skills development within Ghana's Technical and Vocational Education and Training (TVET) system. In response to the growing crisis of textile waste, especially from imported secondhand clothing, the Reclaim Textile Network Ghana piloted creative reuse programs across four universities, five senior high schools, a Rehabilitation Centre, and church women's groups. Guided by Kolb's Experiential Learning Theory and an original conceptual framework, Experiential Upcycling for Sustainable Empowerment (EUSE), the intervention aimed to foster environmental awareness, hands-on creativity, and social inclusion. Using a qualitative case study design, the study employed purposive sampling to select 100 participants, with data collected through semi-structured interviews, workshop observations, photographs, and feedback forms. Thematic analysis revealed transformative learning outcomes: over 90% of participants gained practical upcycling skills, developed products from textile cut-offs, and demonstrated increased environmental consciousness. The intervention also enhanced social confidence, particularly among marginalized groups, and inspired entrepreneurial interest. The EUSE model emerged as a viable framework to integrate sustainability, creativity, and inclusive empowerment into TVET education. While the final exhibition is scheduled post-submission, evidence from participant outputs and testimonials confirms significant impact. This study underscores the potential of creatively repurposed textile waste as a pedagogical resource for skills development, environmental education, and circular economic inclusion in Africa.

Keywords: Textile Waste, Upcycling, TVET, Experiential Learning, Sustainability Education

1. Introduction

The global fashion industry has witnessed exponential growth over the past few decades, leading to significant environmental challenges, particularly concerning textile waste. Fast fashion - a model characterized by rapid production cycles and short-lived garment use—has exacerbated the accumulation of textile waste globally, (Stenton et al., 2021 & Niinimäki et al., 2020). Ghana, notably through markets like Kantamanto in Accra, has become a major recipient of imported secondhand clothing. While this trade supports local livelihoods, it also contributes to unsustainable volumes of textile waste, overwhelming urban infrastructure and the environment (Dhonde & Patel, 2020). The influx of discarded garments and fabric off-cuts has led to blocked drainage systems, increased landfill use, and public health issues. Additionally, the dumping of unsellable secondhand clothing disrupts local textile markets and suppresses the growth of indigenous fashion industries, (Dzramedo et al., 2022). Reports show that over 40% of imported clothing is unusable and often ends up as waste, (Khan & Context, 2024).

In response to this crisis, creative and community-driven models have emerged. Reclaim Textile Network Ghana is at the forefront of such efforts, promoting the reuse of textile cut-offs through upcycling workshops that foster environmental awareness, creativity, and livelihood opportunities. These workshops serve as platforms for empowering youth, women, and persons with disabilities to build practical skills while addressing sustainability goals.

Upcycling, the creative repurposing of textile waste into higher-value products, is a critical component of this model. Dzramedo et al. (2022) demonstrate the potential of transforming fabric off-cuts into fashionable, culturally resonant garments and accessories. In the Ghanaian context, the incorporation of traditional African prints into upcycled designs reinforces national identity while promoting sustainable consumption (Dogoe, 2013). The country's emerging generation of designers increasingly employs experimental techniques—such as patchwork, appliqué, and collage—to develop new aesthetic paradigms that counter fast fashion. These innovations not only reduce waste but also stimulate responsible consumer practices by redefining luxury and value through sustainability.

The significance of community engagement further enhances the pedagogical value of upcycling. Techniques such as patchwork and quilting have long been associated with storytelling, resilience, and collective creativity. Reclaim Textile Network Ghana leverages these cultural practices to create inclusive learning spaces in schools, churches, rehabilitation centers, and women's groups. These workshops encourage knowledge sharing, creative collaboration, and environmental stewardship. Exhibitions and community showcase enable participants to demonstrate their innovations, fostering public awareness and reinforcing a sense of ownership and pride in sustainable practices.

Globally, there is increasing consensus on the need to align Technical and Vocational Education and Training (TVET) with environmental goals. Scholars such as Albertz and Pilz (2025) advocate for the "greening" of vocational systems, while (Li et al., 2023) underscores the value of holistic, sustainability-driven training models. In Ghana, initiatives like Reclaim Textile Network Ghana respond to these calls by offering experiential upcycling programs that combine skill acquisition with sustainability education. Participants—from senior high school students to marginalized community members—develop both practical competencies and eco-conscious decision-making abilities.

This study is grounded in David Kolb's Experiential Learning Theory (1984), which posits that effective learning occurs through a cyclical process involving concrete experience, reflective observation, abstract conceptualization, and active experimentation. Within the Reclaim Textile Network Ghana programs, participants engage with this full cycle—handling textile waste firsthand, reflecting on design processes, conceptualizing reuse ideas, and producing tangible upcycled products. To contextualize this theory within Ghana's sustainability and skills training landscape, the study introduces a localized model: Experiential Upcycling for Sustainable Empowerment (EUSE). This framework integrates experiential learning,

environmental education, creative design, and entrepreneurial empowerment. By aligning TVET practices with sustainable development goals, EUSE offers a practical roadmap for nurturing behavioral change, circular innovation, and inclusive participation. It is within this theoretical and practical context that the study's objectives are framed.

1.1. Theoretical and Conceptual Framework

This study adopts a context-specific conceptual framework—Experiential Upcycling for Sustainable Empowerment (EUSE)—developed to localize Kolb's Experiential Learning Theory (ELT) within Ghana's TVET landscape. While Kolb's model provides a robust foundation for active, reflective learning, the EUSE framework expands it to incorporate sustainability practices, creative skills development, and community empowerment.

Building on insights from Kolb (1984) and Minhus et al. (2024), EUSE responds to the need for vocational training models that not only teach technical competencies but also address pressing environmental and social challenges. It is designed to support hands-on learning experiences using textile waste, enabling participants to generate solutions through cyclical engagement with real-world materials and processes.

The framework consists of four interconnected pillars:

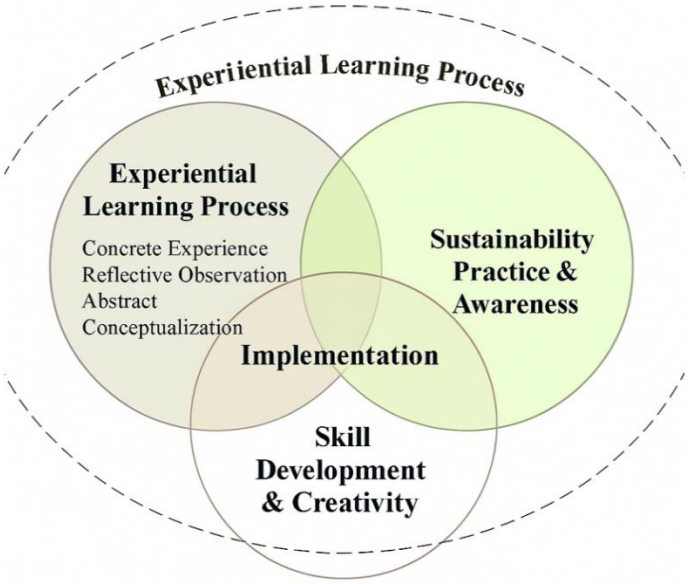
1. Experiential Learning Process: Learners interact directly with textile waste, progressing through the ELT cycle of concrete experience, reflective observation, abstract conceptualization, and active experimentation.
2. Skill Development & Creativity: Participants acquire vocational and design-related competencies, such as stitching, patchwork, and fabric manipulation, which foster innovation and self-expression.
3. Sustainability Practice & Awareness: Activities emphasize environmental responsibility, circular economy thinking, and eco-conscious design principles, enhancing participants' understanding of sustainability.
4. Implementation & Empowerment: Through structured workshops, exhibitions, and outreach, learners apply their skills in real contexts, gaining entrepreneurial motivation and a platform for social inclusion.

These four dimensions form a holistic model that links theory with practice. EUSE emphasizes iterative learning, local relevance, and community impact. It also provides a roadmap for embedding environmental consciousness and creative empowerment into TVET systems—transforming learners into active agents of sustainable change.

Figure 1 visually illustrates how these components interact within a cyclical, practice-based learning model grounded in textile waste reuse.

Figure 1

Experiential Upcycling for Sustainable Empowerment (EUSE) Framework illustrating the integration of experiential learning, creativity, sustainability, and empowerment.



2. Objectives

The study was guided by the following objectives:

1. To explore how experiential learning can be applied within Technical and Vocational Education and Training (TVET) through textile waste upcycling.
2. To assess the creative and technical skills developed by participants through the hands-on transformation of textile cut-offs.
3. To evaluate the impact of the upcycling intervention on participants' awareness of sustainability and circular economy practices.
4. To examine the inclusivity and empowerment outcomes experienced by diverse participant groups, including women and persons with disabilities.

3. Materials and Methods

This study employed a qualitative research approach using a case study design to explore the impact of upcycling textile waste through experiential training in Ghana. The intervention was implemented through Reclaim Textile Network Ghana and involved hands-on training and community engagement across multiple institutions.

3.1 Study Area and Participants

The study was conducted in Accra and its environments, targeting diverse educational and community settings. Participants were drawn from four public universities, five senior high schools (SHSs), one rehabilitation center (supporting persons with disabilities), and church-based women's fellowships. These groups were chosen based on their potential to benefit from vocational sustainability training and their capacity to implement creative textile reuse initiatives.

3.2 Sampling and Study Design

A purposive sampling strategy was used to select 100 participants representing the institutions. The study adopted a participatory model where learners engaged in practical sessions, guided discovery, peer collaboration, and iterative design tasks. Training spanned a 12-week period, culminating in a capstone exhibition to showcase products created from textile cut-offs.

3.3 Data Collection Techniques

Data were gathered using:

1. **Semi-structured interviews** with participants and facilitators (transcripts archived)
2. **Participant observations** during workshops (notes and photo logs)
3. **Photographic documentation** of each group's progress and outputs (to be inserted)
4. **Feedback forms** capturing perceptions on skill acquisition, creative growth, and awareness

3.4 Tools and Materials

Participants were provided with donated fabric cut-offs sourced from local tailoring shops, fashion houses, and textile manufacturers. Notably, Tex Style Ghana Limited contributed substantial volumes of textile waste, which enriched the variety and quality of materials used during the training. These fabric remnants enabled participants to explore diverse design possibilities. Basic sewing tools were provided, while design templates and sketchbooks were contributed by the students themselves as part of their creative process. Trainers included fashion instructors, sustainability educators, and youth mentors.

A thematic analysis approach was adopted for interpreting the qualitative data. Interview transcripts and feedback responses were systematically coded and organized into key emerging themes: *Skill Development*, *Empowerment*, *Environmental Awareness*, and *Community Impact*. Observational notes and photographic evidence were triangulated to strengthen the validity of the findings and to corroborate participant narratives. Analytical rigor was further ensured through peer debriefing and validation by workshop facilitators.

4. Results

The training and creative engagement programs led by Reclaim Textile Network Ghana produced strong outcomes across technical, environmental, and social dimensions. The initiative involved participants from diverse institutions, including four universities, five senior high schools, a rehabilitation centre, and church-based women's groups—who actively transformed textile cut-offs into functional and artistic products. The results shown in Figures 2—8 are categorized into three main thematic areas: (1) skill development and creative empowerment, (2) environmental awareness and sustainable practices, and (3) social inclusion and community impact.

4.1 Creative and Technical Skill Acquisition

Participants demonstrated increased mastery in: Hand sewing and machine stitching Patchwork, mending, and functional upcycling. Product development includes bags, cushion covers, wearable art, and wall décor. Several university students integrated digital design skills to document their work, while SHS participants collaboratively built product lines for classroom displays. Photos of each group's activities and finished work will be inserted in the final version.

Figure 2

Introducing Labone SHS to Textile cut -off skill in-door mat fascinators

Figure 3

Rehabilitation Center Students going through skill development

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Figure 4

LA Presbyterian Students going through skill development

Figure 5

Accra Technical University Club going through skill development

Figure 6

Asanka University College of Science and Technology utilizing fabric cut-offs in garment production

Figure 7

School of Ordinance utilizing fabric cut-offs in variety of items

Figure 8

Final items produced

These results support objective 2 of the study, confirming that experiential training fosters creativity and practical skill mastery across multiple educational levels.

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4.3 Environmental and Sustainability Awareness

Prior to training, 78% of participants reported limited understanding of textile waste as an ecological issue. Post-training responses showed:

1. 94% could explain the environmental impact of fast fashion
2. 88% committed to applying reuse practices in personal or school projects
3. Increased peer advocacy with at least 6 groups initiating outreach efforts in their communities

4.3 Social Inclusion and Empowerment

The inclusion of disabled persons and church women's groups was a major success. Testimonies revealed increased confidence, sense of purpose, and entrepreneurial aspirations. The rehabilitation center participants, for instance, created adapted tools and accessories and expressed readiness to form a cooperative post-program.

Quotes from feedback:

1. "I didn't know I could create something this useful from waste. Now I want to teach others." – SHS Participant
2. "It is like I discovered my hands again." – Woman from church group

5. Discussion of Findings

The discussion integrates the findings with the four key objectives of the study, reinforcing the EUSE framework's relevance and applicability to Ghana's TVET sector. Objective 1 explored how experiential learning can be applied through textile waste upcycling. Participants demonstrated this by engaging actively with textile cut-offs using Kolb's experiential learning cycle—from hands-on activities to final exhibitions. This validates experiential learning as a strong approach to sustainable vocational training. For Objective 2, participants across SHS and university levels developed clear improvements in sewing, patchwork, and creative design. These outcomes reinforce the findings of Dzramedo et al. (2024) on the power of upcycling to stimulate fashion innovation within a local cultural context. Objective 3 focused on environmental awareness. After the intervention, most participants could explain textile waste's ecological implications and began initiating reuse or advocacy activities. This outcome confirms the transformative effect of participatory sustainability education (Niinimäki et al., 2020). Regarding Objective 4, inclusion and empowerment were clearly observed. Participants from the rehabilitation centre and church women's groups gained both confidence and entrepreneurial motivation. These findings align with global calls for socially inclusive TVE.

Overall, the study underscores how the EUSE framework integrates learning, innovation, and community empowerment in one cohesive model. It supports TVET transformation that is locally grounded, environmentally responsible, and socially inclusive.

6. Conclusion

This study explored how experiential, TVET-based upcycling programs can empower diverse groups through skill development and sustainability education. Results show that participants gained technical mastery, eco-consciousness, and a sense of agency. The EUSE framework serves as a replicable model for community-based sustainability education in developing contexts.

While the final exhibition is scheduled post-submission, photographic and testimonial evidence confirms the impact. Future research can examine long-term behaviour changes and economic outcomes of participants who continue reuse practices or launch related businesses.

The study underscores the potential of creative reuse not only as an educational tool, but as a catalyst for inclusive circular economies.

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