

## **DelaWEAR: An interdisciplinary team's discovery learning approach to reducing post-consumer textile waste through experiential retail.**

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**Background and Purpose:** The fast fashion model gives consumers the opportunity to shop different brands and buy affordable clothing pieces for every event (Binet et.al. 2019). Individuals are encouraged to buy new outfits for every occasion but are unaware of the environmental impacts of their fast fashion shopping sprees (Niinimäki et al. 2020). The fast fashion system relies on cheap, synthetic materials and quick, overseas production to keep up with ever-changing microtrends promoted on social media (Ting, 2023). The system promotes overconsumption and increases post-consumer textile waste, as consumers now view clothing as disposable (Niinimäki et al. 2020). 17 million tons of textile waste were generated in 2018 (EPA, 2023). While educational institutions teach about how plastic bottle and bag waste harm the planet, textile waste remains widely unmentioned. In 2018, 14.7% of the textile waste was recycled, 18.9% was combusted for energy recovery, and 66.4% was landfilled (EPA, 2023). Currently, the methods to extend the lives of textiles are not completely environmentally beneficial or financially viable. As for resale, only 10-20% of the donated clothing is resold within the country; the rest is landfilled or sent overseas (Cao, 2021).

**Interdisciplinary Approach:** Today's grand challenges will not be solved by one discipline alone. But the integration of knowledge, methods, and expertise from across science and engineering is not simple or automatic. Barriers often slow progress — from outdated educational approaches to rigid organizational structures (NSF, 2019). This concept paper offers a best practice-proposing a novel business model created by an interdisciplinary team of students, professors, and community mentors supported by a University supported Office of Economic Innovation and Partnerships “Spin In” program. The “Spin In” program was created to spark cross-sector innovation with regional impact, led by students.

**Strategy:** There were 5 student teams total in the broader Spin In program ranging from biomedical to computer science and engineering applications. This student team consisted of 3 fashion students (well versed in design, retail and sustainability) 3 finance and economics students (extensive market research on sustainable apparel and textiles, supplying crucial data to substantiate the business proposal). Students met weekly over the course of one year to develop a “launch plan” and were mentored by a team of experts from business, policy, retail and fashion. The students conducted market research, developed a financial plan, coordinated an assortment plan, developed financial forecasts, a business plan, all branding, marketing and communication.

**Outcomes:** The resultant solution “DelaWEAR” is a discovery learning lab situated on a main thoroughfare, touted as a local sustainable fashion movement generating awareness regarding the impact of fast fashion on the global environment. Guided by feedback from educators, students, and the community, the business model offers a three-pronged approach to decreasing post-consumer textile waste through consumer education, within a brick and mortar. While all three prongs are contemporaneous, the system starts with the “Collection and Re-Distribution” stage. In partnership with community partner Goodwill, discarded textiles gain new value as they are repurposed to be sold in an on campus fabric store at the University of Delaware. The next phase, “Educational Initiatives,” emphasizes the importance of teaching future generations how to extend the lifetime of clothing. The physical retail space will host events such as a Sip and Sew, where consumers can gather socially and learn how to repair or upcycle, and summer camps for children. In the third phase, “Merchandise Collection,” textiles will be repurposed into a University of Delaware merchandise collection designed by UD students. Building on UD’s partnership with Goodwill Industries, the goal is to add a retail component that would both extend the textiles’ lifespan and provide experimental, cross-discipline experiences that enrich the Institutions fashion curriculum. DelaWEAR aligns well with the institution's commitment to strengthen sustainability practices. It also connects students with youth, the greater community and other students across disciplines.

**Point of Difference:** By leveraging partnerships with organizations like Goodwill and engaging educational institutions like the University of Delaware, the idea goes above and beyond the approach of selling upcycled clothing made from remanufactured textiles. DelaWEAR is not just a retailer, but an educator. There is a clear lack of consumer education about the harmful effects of the fashion industry and how to combat it with sustainable fashion processes. The core mission of the solution is to increase consumer education, and this can be executed using our educational initiatives. Remanufacturing textiles is a short-term solution, but teaching consumers how to implement sustainable fashion in their daily lives creates long-term impact. With minimal start-up costs, DelaWEAR can function as a self-sustaining business. Functioning as a learning lab UD students earn course credit, learning is folded into the concept. **Reflection:** Students and faculty reflecting on the project confirm tangible learning from the interdisciplinary interaction, as one finance student reflected *“I personally never knew what went on behind the scenes of making or designing garments,” said an economics major. “All the measurements, material and just the labor itself— it was really eye-opening to me as a business guy that I was not the only one messing around with numbers.”* As faculty mentor reflects, interdisciplinary learning poses new questions—pushing learning beyond what one discipline can do alone *“What I was most surprised by was how our finance and business students deepened and strengthened the project by asking questions I didn't even know were questions, ”Then to watch the fashion students contextualize and/or push back or bring more data to any issue during our meetings, I thought— wow. We are going into uncharted territory. This is exciting.”*

**Recommendations and Implications:** After proposing the business model in spring of 2023, the team was awarded an internal grant of \$50,000 in financial assistance and guidance from the university. Future research will include executing the business plan—utilizing grant funds for

acquiring real estate, product development, curriculum development, talent acquisition, and promotional activities.

### References

- Binet, F., Coste-Manière, I., Decombes, C., Grasselli, Y., Ouedermi, D., & Ramchandani, M. (2019). Fast fashion and sustainable consumption. *Fast fashion, fashion brands and sustainable consumption*, 19-35.
- Cao, H. (2021). Chapter 8. End of life clothes and their management. In *Waste Management in the Textile Industry*, R. Nayak & A. Patnaik (Eds.), pp. 157-172. Woodhead Publishing, Elsevier, Duxford, UK.
- Echeverria, C. A., Handoko, W., Pahlevani, F., & Sahajwalla, V. (2018). Cascading use of textile waste for the Advancement of Fibre Reinforced Composites for building applications. *Journal of Cleaner Production*, 208, 1524–1536.  
<https://doi.org/10.1016/j.jclepro.2018.10.227>
- Environmental Protection Agency. (2023). Textiles: Material-Specific Data. EPA. Retrieved February 29, 2023, from <https://www.epa.gov/materials-waste-and-recycling/textiles-material-specific-data>
- National Science Foundation. (2019) Learn about convergence research. Retrieved February 29, 2023, from <https://new.nsf.gov/funding/learn/research-types/convergence-research>
- Niinimäki, K., Peters, G., Dahlbo, H., Perry, P., Rissanen, R. and Gwilt, A. 2020. “The Environmental Price of Fast Fashion.” *Nature Reviews Earth & Environment* 1(4): 189-200.
- Ting, T. Z., & Stagner, J. A. (2023). Fast fashion-wearing out the planet. *International Journal of Environmental Studies*, 80(4), 856-866.