Critical Fashion Practice: Transforming Difficult-To-Recycle Metal Waste from Post-Recovery Workwear into Modular Jewellery to Reveal the Unseen Complexities of Apparel Recycling

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2025

Exegesis in support of practice-based Thesis
Master of Design
Auckland University of Technology

Abstract

This research investigates how modular jewellery design can function as a form of critical fashion practice to address the overlooked complexities of apparel recycling, with a particular focus on the reuse of post-recovery hardware waste from industrial workwear. By transforming discarded components such as zippers, snap fasteners, and metal fittings into adaptable, customisable jewellery, the project proposes an alternative to conventional fashion consumption—one that fosters emotional durability, user engagement, and reduced material extraction.

Developed through a hybrid methodology that combines practice-led and practice-based approaches, the project draws on waste-led design, circular economy principles, and up-cycling as both critical and speculative practice. Collaborating with local textile recycler ImpacTex for material sourcing, the work grapples with the challenges of repurposing hard-to-recycle waste while exploring modularity as an ethical framework for design longevity. Jewellery, with its capacity for personal attachment and embodied storytelling, becomes a vehicle for environmental critique—revealing the embedded histories of industrial materials and disrupting the invisibility of waste. Positioned at the intersection of design activism, critical fashion, and reflective practice, this project contributes to the discourse on sustainable design by demonstrating how artefacts can operate as communicative agents, provoking reflection and encouraging behavioural shifts in both the consumer and within broader fashion systems.

Keywords

Critical Fashion, Jewellery, Modularity, Recycling Complexities, Waste-led Design

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the Acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signed 

05/05/2025

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Ackowledgments

I would like to express my sincere and warm gratitude to my supervision Lisa McEwan and Jennifer Whitty for their time, support, industrial and educational knowledge transmission and guidance along the whole process, as well as learning advisor I'u Tuagalu who offered valuable pointers for my written work, to Sue Gallagher and George Hajian for their attention, reassurance and implication in our projects development, to the AUT 3D lab team; special mentions to Glenn Maxwell and Angus Roberts for their kindness and advices in my practice explorations, and to Galina Joukova for her help with fashion matters, furthermore, to Auckland University of Technology and the Fashion and Design department for having me along this Master, allowing me to graduate of my international double diploma program at ECAM Lyon which I thank for those unforgettable years and offering the opportunity to finish this hybrid program in here.

I would like to extend my gratitude to several more people, to the ImpacTex team, to Ella Martin, Carol and Jeff Vollebregt for their warm welcome in their workshop, for sharing precious information and insights on my research topic, and for generously supplying me with post-recovery resources, fundamentally helping the direction and outcomes of my practice.

I am deeply thankful for my cherished ones, for their faith in me and support in my studies, my Mom and Dad who made my initial studies along with this Master on the other side of the Earth possible, for my family and their unconditional support, love, care and encouragements that never miss to make me feel capable and surrounded. Knowing you are far but at the same time so close, and proud heartened my journey and confidence. Thank you to Shony for accompanying me along this adventure, believing in me and making my life even sweeter. I am grateful I had to live and share this Master experience abroad with my friends Marin, Axel, Dàniel, Adrien, Ludovic, and to all the amazing people I met on the way.

Ethics Approval

This project did not require formal Ethics Approval as it did not involve human participants, animals, or any other activities that necessitate ethical review, according to the guidelines of Auckland University of Technology. As such, no Ethical Approval was sought or granted for this study.

Introduction

This project explores how critical fashion practices using waste-led jewellery design can challenging conventional consumption patterns through the repurposing hard-to-recycle metal waste from post-consumer clothing. The project involves the design of adaptable and customizable jewellery pieces that, through their modularity, encourage sustainability by extending the life of the jewellery and reducing consumer temptation to replace the items with new. The work aims to reveal the often-overlooked complexities of apparel recycling, offering both a conceptual and practical critique of the linear fashion and apparel system. The jewellery pieces created through this process are not simply adornments but functional, adaptable objects that encourage reflection on environmental sustainability and material value.

My personal sensitivity to waste was shaped by prior industrial experiences and observations of the waste produced within fast-paced manufacturing environments I first salvaged discarded zipper teeth from an internship at a luxury clothing brand in France, which provided the impetus for this project.
Using an Action Research design methodology, I embarked on a process of discovery, followed by cycles of planning, action, observation and reflection. In the initial discovery phase, my decision to study and locate this research in Aotearoa New Zealand led to a collaboration with ImpacTex, a local textile recycling plant that provided my primary materials of post-recovery hardware waste, specifically metal components from workwear. This collaboration grounded the project in real-world resource constraints, offering a direct engagement with the materials I aimed to transform, and revealing a critical gap in the apparel recycling system regarding these materials.

This led to my exploration of how design can address waste issues – not only by working with existing resources but by raising awareness about the environmental impact of clothing overproduction, over-consumption, and disposability challenges. Jewellery's unique position between art and fashion gives it both a contemplative and critical purpose. Its intimate nature fosters deeper emotional connections with users and provides them with the opportunity to engage meaningfully with it, aligning with principles of longevity and reduced consumption. This makes the jewellery particularly effective in communicating the project narrative around the challenges of waste management.

As a designer, I believe it is not sufficient to work obliviously within the context of mass production; we must address and question these systems, taking responsibility for seeking greater harmony with the natural world. This project embodies my belief that environmental sustainability requires both reflection and action, and that critical fashion practices can be employed to tool for communicating the complexities of clothing recycling to consumers in an effort to shift damaging consumption patterns.

The practice-led research described in the following chapters highlights the physical and conceptual difficulties of working with reclaimed industrial materials. These challenges mirror the broader systemic inefficiencies in apparel recycling that are integral to the project's critical narrative.

Contextual Review

Framing the Research

This chapter outlines the contextual landscape informing the project, identifying key issues and precedents that shape its direction. The review serves to situate the research within broader discussions on apparel waste, recycling systems, consumer engagement, and the role of designers in sustainability discourse.[1] It also examines relevant practitioners and case studies working with material reuse and circularity[2]—challenging the traditional end-of-life model by promoting the recovery, reuse and recycling of materials throughout a product's lifecycle.[3] By critically engaging with these themes, the chapter highlights existing gaps and opportunities, establishing a foundation for the project's practical investigations and its contribution to sustainable design conversations—though achieving true circularity remains a complex challenge and is not intended here.

Waste in the Apparel Industry

The Issue

The apparel industry, spanning from fast fashion to Haute Couture, is a major contributor to global environmental waste.[4] While often conflated with textile waste, apparel waste specifically refers to garments and clothing-related materials discarded before, during, or after use.[5] While I acknowledge that textile waste is a significant issue in contemporary society, due to the limitations of the project timeframe and scope, this project will focus specifically on apparel waste. It aims to highlight the industry's challenges around overproduction, short consumption cycles, and inefficient end-of-life solutions.

1 Fletcher, Kate. Sustainable Fashion and Textiles: Design Journeys. London: Earthscan, 2008.
Gwilt, Alison. A Practical Guide to Sustainable Fashion. London: Bloomsbury Publishing, 2014.
Alastair Fuad-Luke, Design Activism, 2013, https://doi.org/10.4324/9781849770941.

2 Julian Kirchherr, Denise Reike, and Marko Hekkert, "Conceptualizing the Circular Economy: An Analysis of 114 Definitions," *Resources, Conservation and Recycling* 127, no. 1 (December 2017): 221–32, https://doi.org/10.1016/j.resconrec.2017.09.005.

3 Martin Geissdoerfer et al., "The Circular Economy - a New Sustainability Paradigm?," Journal of Cleaner Production 143, no. 1 (February 1, 2017): 757–68, https://doi.org/10.1016/j.jclepro.2016.12.048.

4 Fletcher, K., & Tham, M. (2019). *Fashion and Sustainability: Design for Change*. Laurence King Publishing.
Rissanen, T. (2012). *Fashion and Waste: Recycling in Fashion Design*. Journal of Fashion Design.
Kirsi Niinimäki et al., "The Environmental Price of Fast Fashion," *Nature Reviews Earth & Environment* 1, no. 4 (April 23, 2020): 189–200, https://www.nature.com/articles/s43017-020-0039-9.

5 Gwozdz, W., et al. (2017). *Consumer Behavior and Sustainability in the Apparel Industry*. Springer.

The global scale of apparel waste is alarming. The Ellen MacArthur Foundation[6] reports that over 85% of used and discarded clothing ends up in landfills, while less than 1% is recycled into new garments, despite most fibres being recyclable.[7] These figures reflect a linear system where production vastly outpaces sustainable consumption or disposal.[8]

Apparel waste occurs at multiple stages:

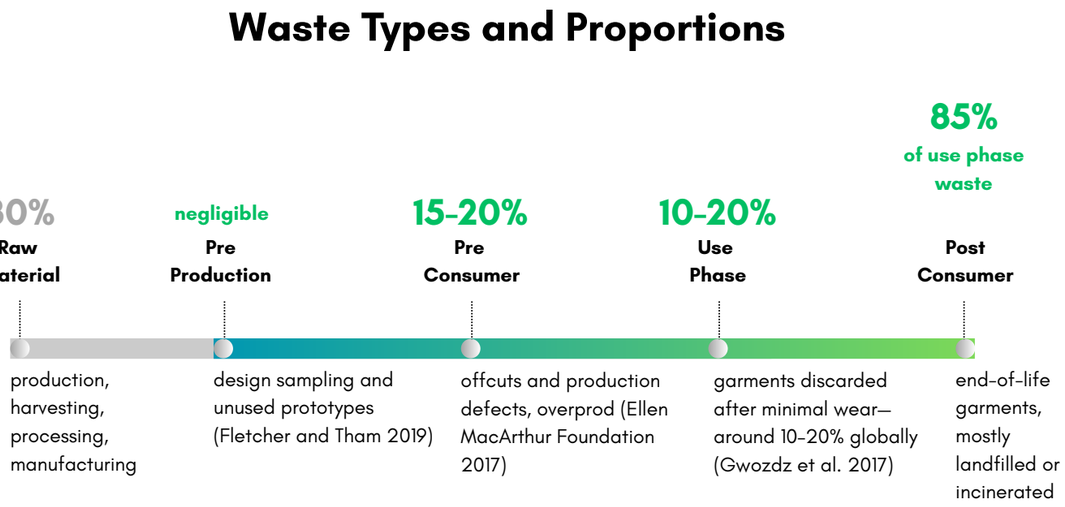


Figure 1. Chronological Graph of Waste Types & Proportions through Apparel Life Cycle, (Alix Vital, 2025).[9]

6 Ellen MacArthur Foundation. A New Textiles Economy: Redesigning Fashion's Future, 2017.

7 Payne, Alice. "Open and Closed Loop Recycling of Textile and Apparel Products." Textiles and Clothing Sustainability 1, no. 1 (2015).

8 Mindful Fashion. State of the Industry Report, Aotearoa New Zealand, 2024.

9 Ellen MacArthur Foundation. A New Textiles Economy: Redesigning Fashion's Future, 2017.
Fletcher, Kate, and Mathilda Tham. Earth Logic: Fashion Action Research Plan. London: The JJF Studio, 2019.
Gwozdz, Wencke, et al. "Environmental Impact of Online vs. In-Store Shopping in Fashion." Journal of Retailing and Consumer Services, 2017.

Apparel waste also differs in scale regarding the quality category.[10] The rise of fast-fashion accelerates the entirety of these patterns through low-cost, trend-driven, high-turnover production. While even luxurious and high-quality haute couture—less concerned by short end-of-life post-consumer discharge, generates some pre-production and pre-consumer waste (in sampling, defective production and exclusive runs), they often find collaborations with other organisations to process most of them.[11]

Additionally, the workwear apparel category—usually produced at scale for specific industries—presents its own challenges due to uniform design, material durability, and safety requirements, which complicate reuse or recycling—sometimes premature post-use. Large volumes are discarded annually, often with minimal recovery infrastructure.[12] Although technologies now allow fibre recovery and sorting,[13] uptake remains limited. Industry critiques emphasize the urgent need for circular models, aligning with the waste minimization hierarchy,[14] that incorporate reuse (repurposing components without breaking them down), recycling (processing materials into new products),[15] and closed-loop systems (materials returned to the same quality and function).[16]

10 Low End, High End, Workwear

11 Rissanen, Timo. "No Waste: Fashion Design for Zero Waste Fabrication." *Fashion Practice* 5, no. 1 (2013): 99–119.
"INSIDE LVMH," Insidelvmh.com (INSIDE LVMH, 2021), https://www.insidelvmh.com/. and LVMH to Alix Vital, "Introduction to Life 360 and Internal Ecological Programs," Presentation of the Company, HR and Content Confidential Communication, Internship context, 2024.

12 Atiq Zaman, Dora Marinova, and Anne Farren, "The Circular Economy and Mining Workwear Waste Management in Australia: A Case Study," *International Journal of Sustainable Fashion & Textiles* 2, no. 1 (April 1, 2023): 101–13, https://doi.org/10.1386/sft_00023_1.
Nadia Malinverno et al., "Identifying the Needs for a Circular Workwear Textile Management – a Material Flow Analysis of Workwear Textile Waste within Swiss Companies," *Resources, Conservation and Recycling* 189 (February 1, 2023): 106728, https://doi.org/10.1016/j.resconrec.2022.106728.

13 Baloyi, Nombulelo, et al. "Advancements in Textile Recycling Technologies." *Journal of Cleaner Production*, 2023.
Muhammad, Imran. "Sorting Waste Textiles for Circular Economy Solutions." *Waste Management Review*, 2022.

14 Authority, Environmental Protection, and Cloisters Square. "The Waste Hierarchy." Australia: EPA. Retrieved March 12 (2017): 2018.
Prevention being the best option, companies like YKK are trying to develop recyclable (fastening) solutions, following a "design for recycling" approach [BASF]. It is a good game changer for future production but does not solve the present issue of dealing with existing waste.

YKK, "YKK Announces New Collection of Recycled Zippers Made with ECONYL® Regenerated Nylon in Europe," YKK Americas, February 22, 2022, https://ykkamericas.com/ykk-announces-new-collection-of-recycled-zippers-made-with-econyl-regenerated-nylon-in-europe/.
"BASF and Inditex Make a Breakthrough in Textile-To-Textile Recycling with Loopamid, the First Circular Nylon 6 Entirely Based on Textile Waste," Basf.com, 2024, https://www.basf.com/global/en/media/news-releases/2024/01/p-24-109.

15 Gwozdz, W., et al. (2017). *Consumer Behavior and Sustainability in the Apparel Industry*. Springer.

16 Fletcher, Kate, and Mathilda Tham. *Earth Logic: Fashion Action Research Plan*. London: The JJF Studio, 2019.
Pammi Sinha, "Shaping Sustainable Fashion: Changing the Way We Make and Use Clothes Edited by Alison Gwilt and Timo Rissanen," *The Design Journal* 16, no. 1 (March 2013): 125–27, https://doi.org/10.2752/175630613x13512595147078.
Martin Geissdoerfer et al., "The Circular Economy - a New Sustainability Paradigm?," *Journal of Cleaner Production* 143, no. 1 (February 1, 2017): 757–68, https://doi.org/10.1016/j.jclepro.2016.12.048.

Design responses to apparel waste increasingly draw from circular economy principles, aiming to extend the life cycle of products and materials.[17] Emerging solutions and initiatives such as local recycling by Little Yellow Bird in Wellington, Space Between or The Oversew Fashion Awards demonstrate potential for regional impact.[18] However, despite their promise, these circular strategies face limitations. Policy supports and systemic change are required, including consumer participation.

Limitations of Apparel Recycling

Although often promoted as a solution to fashion waste, apparel recycling faces significant technical, economic, social, and logistical challenges, particularly in relation to post-consumer and post-recovery garments.[19]

The complexity of recycling garments composed of diverse components and mixed materials highlights the need for innovative design strategies that enable disassembly and material separation, thereby improving the viability of textile recycling and advancing circularity goals.[20] Apparel often combines textiles, synthetics, and hardware, increasing the labour and time costs of sorting and disassembly.[21] Although technologies for fibre recovery and sorting are progressing, significant challenges remain due to limited infrastructure, low scalability, and high processing costs.[22]

17 Julian Kirchherr, Denise Reike, and Marko Hekkert, "Conceptualizing the Circular Economy: An Analysis of 114 Definitions," *Resources, Conservation and Recycling* 127, no. 1 (December 2017): 221–32, https://doi.org/10.1016/j.resconrec.2017.09.005.
Lucia Rigamonti and Eliana Mancini, "Life Cycle Assessment and Circularity Indicators," *The International Journal of Life Cycle Assessment* 26 (September 7, 2021), https://doi.org/10.1007/s11367-021-01966-2.

18 Little Yellow Bird, "Little Yellow Bird," Little Yellow Bird, 2023, https://www.littleyellowbird.com/.
"Fundamentals Range," Space Between, 2021, https://spacebetween.ac.nz/archive/fundamentals-range/.
"Stuff," Stuff.co.nz, 2025, https://www.stuff.co.nz/life-style/fashion/94963538/cartertons-oversew-recycled-fashion-show-taking-on-a-global-problem.

19 Nidhi, A. (2023). Textile Recycling: Techniques and Challenges. Fibre2Fashion. Retrieved from https://www.fibre2fashion.com/industry-article/9777/textile-recycling-techniques-and-challenges
Ludes, A. (2023). The challenge of sorting and recycling textiles. Recycling Product News. Retrieved from https://www.recyclingproductnews.com/article/40106/the-challenge-of-sorting-and-recycling-textiles
Online Clothing Study. (2020). Why is it Difficult to Recycle Your Clothes. Retrieved from https://www.onlineclothingstudy.com/2020/10/why-is-it-difficult-to-recycle-your.html

20 Kirchherr, J., et al. (2017). Barriers to the Circular Economy: Evidence from the European Union. Journal of Cleaner Production.

21 Fletcher, Kate, and Mathilda Tham. 2019. Earth Logic: Fashion Action Research Plan. London: The JJF Studio.
Nadia Malinverno et al., "Identifying the Needs for a Circular Workwear Textile Management – a Material Flow Analysis of Workwear Textile Waste within Swiss Companies," Resources, Conservation and Recycling 189 (February 1, 2023): 106728, https://doi.org/10.1016/j.resconrec.2022.106728.
Rachael Davis, "Fiber-To-Fiber Textile Recycling | Textile World," September 29, 2023, https://www.textileworld.com/textile-world/features/2023/09/fiber-to-fiber-textile-recycling/.

22 Baloyi, Nombulelo, et al. 2023. "Advancements in Textile Recycling Technologies." Journal of Cleaner Production.
Muhammad, Imran. 2022. "Sorting Waste Textiles for Circular Economy Solutions." Waste Management Review.

Most clothing—especially workwear, includes metallic hardware such as rivets, zippers, and snap fasteners designed for durability. While essential for the functionality and aesthetics of garments,[23] these components significantly complicate the recycling process. These embedded components, though small in volume, require high effort and offer little material value. They represent a form of "waste-from-waste": secondary by-products rarely reintegrated into circular systems—that are largely excluded from mainstream recovery[24] due to inefficiencies in design and end-of-life processing. To date, no studies appear to explicitly address this topic, and existing literature on recycling solutions consistently overlooks the fate of garment hardware—suggesting a tendency to disregard the issue rather than engage with it directly. The lack of comprehensive data on the fate of sorted hardware components highlights a significant gap in current recycling practices and research.[25] Managing these gaps requires general change in how apparel is designed, valued, and recovered.[26] Moreover, greenwashing obscures the actual effectiveness of these systems, with brands often overstating their sustainability claims without confronting the systemic inefficiencies of current recycling models.[27]

23 Richard H. Moyer and Susan A. Everett, "Everyday Engineering: Keeping It Together—Fascinating Fasteners," *Science Scope*, 2015, https://doi.org/10.2505//4//ss15_039_01_12.

24 Moyer, Hilary, and Anna Everett. 2019. "Designing Garment Closures: Historical Functions and Contemporary Issues." *Textile: The Journal of Cloth and Culture*.
Khöler, Raphael. 2021. "Recycling Challenges in Multi-Material Consumer Goods." *Circular Economy Studies*.

25 Manjiri Paranjape and Ashok Athalye, "Curr Trends Fashion Technol Textile Eng Textile Waste Management-Innovative Separation Techniques," *Curr Trends Fashion Technol Textile Eng* 9, no. 2 (2024), https://doi.org/10.19080/CTFTTE.2024.09.555757.

26 Moyer, Hilary, and Anna Everett. 2019. "Designing Garment Closures: Historical Functions and Contemporary Issues." *Textile: The Journal of Cloth and Culture*.
Khöler, Raphael. 2021. "Recycling Challenges in Multi-Material Consumer Goods." *Circular Economy Studies*.

27 Leila Alizadeh, Marco Ciro Liscio, and Paolo Sospiro, "The Phenomenon of Greenwashing in the Fashion Industry: A Conceptual Framework," *Sustainable Chemistry and Pharmacy* 37, no. 101416 (February 1, 2024): 101416, https://doi.org/10.1016/j.scp.2023.101416.
Darya Badiei Khorsand et al., "Greenwashing in the Fashion Industry: Definitions, Consequences, and the Role of Digital Technologies in Enabling Consumers to Spot Greenwashing," *Springer Texts in Business and Economics*, January 1, 2023, 81–107, https://doi.org/10.1007/978-3-031-33302-6_6.

Gaps in Ethical Consumption

While consumer awareness of sustainability has increased in recent years, particularly regarding fashion waste and overproduction, a significant gap remains between attitudes and behaviours.[28] The rise of fast and ultra-fast fashion has normalized disposability and overconsumption, reinforcing a throwaway culture where clothing is perceived as low-value and easily replaceable.[29] Despite good intentions, many consumers rationalise unsustainable purchases through neutralization techniques, such as assuming donated or recycled clothing will be properly handled, thus preserving a positive self-image.[30]

However, knowledge about sustainable supply chains, materials, and recycling systems remains limited. Many consumers overestimate the efficacy of clothing collection schemes, unaware that complex garments—particularly those with alloy hardware or mixed fibres, often fall outside recycling capabilities.[31] This disconnection stems from insufficient communication and transparency about post-consumer garment fate, especially during the end-of-life phase.[32]
Moreover, here again, the industry's varying degrees of greenwashing—from vague eco-labelling to misleading recycling claims—further obscure the reality of sustainability practices, making it difficult for consumers to engage meaningfully.[33] This disconnect reinforces structural inaction across the fashion value chain.

28 Simon-Kucher & Partners. 2022. *Green Is the New Black: Sustainability and Consumer Choices*.
Deloitte, "The Sustainable Consumer 2023," Deloitte (Deloitte, 2023), https://www2.deloitte.com/uk/en/pages/consumer-business/articles/sustainable-consumer.html.

29 Despotović, Milica, and Christoph Huber. 2022. "Sustainable Fashion Perception Gap." *Fashion and Sustainability Studies*.

30 Teerakapibal, Sireethorn, et al. 2022. "Attitude-Behaviour Gaps in Fashion Consumption." Journal of Consumer Behaviour.

31 Despotović, Milica, and Christoph Huber. 2022. "Sustainable Fashion Perception Gap." *Fashion and Sustainability Studies*.

32 Teerakapibal, Sireethorn, et al. 2022. "Attitude-Behaviour Gaps in Fashion Consumption." *Journal of Consumer Behaviour*.

33 Nicholas Eng et al., "'I Had No Idea That Greenwashing Was Even a Thing': Identifying the Cognitive Mechanisms of Exemplars in Greenwashing Literacy Interventions," *Environmental Education Research* 27, no. 11 (September 17, 2021): 1599–1617, https://doi.org/10.1080/13504622.2021.1976732.

Wearable Art & Activist Medium

Fashion & Provocation

Prior to fast fashion, which emerged as a result of global financial deregulation in the 1980s, a slower model of fashion manufacturing and purchasing existed.[34] However, even this was challenged by certain sectors of society. The punk movement, which emerged in the 1970s in New York, was a direct response to poor living conditions and political dissatisfaction, using fashion as a means of protest.[35] Punks repurposed everyday items, creating 'deranging' looks that challenged societal norms and attracted attention. This practice was a powerful tool for communication and disapproval.[36] Vivienne Westwood, a key figure in the UK punk scene, rejected consumerism and promoted a 'do-it-yourself' approach to fashion.[37] She encouraged the use of repurposed items, such as safety pins and dog collars, as fashion political statements.[38] According to Cunningham and Nixon,[39] this was a form of 'anti-fashion.' The 1970s also marked a turning point in Critical Fashion Practice, as protest and upheaval began to influence clothing.[40] In response to decades of conservatism/uniformity, the new generation sought to express individual identities through fashion that defied the past. While McLaren and Westwood are often credited with creating punk style, their work also contributed to the broader movement of Critical Fashion Practices,[41] which focused on subverting traditional norms and empowering personal expression through clothing.[42]

34 Nebahat Tokatli and Ömür Kızılgün, "From Manufacturing Garments for Ready-to-Wear to Designing Collections for Fast Fashion: Evidence from Turkey," Environment and Planning A 41, no. 1 (2009): 146–162, https://doi.org/10.1068/a4030.

35 Matthew Worley, "Punk - Museum of Youth Culture," Museum of Youth Culture (Museum of Youth Culture, December 3, 2019), https://www.museumofyouthculture.com/punk/.

36 Srinidhi Madurai K, "The Punk Movement: Rebellion and Subversion in Fashion - Fashion Law Journal," fashionlawjournal.com, September 7, 2023, https://fashionlawjournal.com/the-punk-movement-rebellion-and-subversion-in-fashion/.

37 Fletcher, K. (2008). "Sustainable Fashion and Textiles: Design Journeys."
Joy, A., Sherry, J. F., Venkatesh, A., Wang, J., & Chan, R. (2012). "Fast Fashion, Sustainability, and the Ethical Appeal of Luxury Brands." *Fashion Theory, 16*(3), 273-295.
"ICONS: Vivienne Westwood 'Punk, Fashion, Music & DIY' (Part II) | Yolancris," Yolancris, December 14, 2018, https://yolancris.com/icons-vivienne-westwood-part-ii/.

38 Rivett, D. (2011). "Punk Rock and the Politics of Fashion." In *Fashion and Politics*, ed. by D. B. Crang, L. Kroes, 77-91.

39 Nixon, S. (2012). "Fashion as a Means of Resistance: Punk, Anti-Fashion, and Critical Fashion." In *Fashion and Anti-Fashion: An Anthropology of Fashion* (pp. 57-72).
Cunningham, P. (2010). "Fashion, Protest, and Identity: Punk, Anti-Fashion, and Critical Fashion." *Textile: The Journal of Cloth and Culture, 8*(3), 348-367.

40 Kate Fletcher, *Craft of Use: Post-Growth Fashion* (Routledge, 2016).
Breen, P. (2015). "The Politics of Fashion: Punk and the Emergence of Critical Fashion." *Fashion Theory: The Journal of Dress, Body & Culture, 19*(4), 443-465.

41 "What Is Critical Fashion Practice? · Critical Fashion Project," Criticalfashionproject.org, 2017, https://www.criticalfashionproject.org/text/what-is-critical-fashion-practice/#1.

42 Geczy, Adam and Karaminas, Vicky. Critical Fashion Practice: From Westwood to van Beirendonck. London: Bloomsbury Academic, 2017. https://www.bloomsbury.com/au/critical-fashion-practice-9781474265546/

Art, Fashion & the Question of Value

Fashion has long occupied a contested space between function and expression, raising debate over its status as 'art'—a term traditionally associated with objects created primarily for aesthetic and contemplative purposes.[43] Karaminas and Geczy explore intersections between fashion and art, including performance and conceptual practice.[44] Critics argue that fashion's commercial and temporal nature undermines its artistic value.[45] Jewellery, however, exists in a liminal zone between fashion and art. While it shares fashion's bodily intimacy, it also embodies sculptural qualities and conceptual depth, positioning it firmly within the art discourse. Its scale and personal engagement demand close contemplation, and thoughtful curation elevates its capacity to communicate meaning beyond adornment.

Jewellery as a Critical Medium

This research draws on the intimate relationship between jewellery and the body, particularly in its talismanic role. Jewellery is approached as a relational object—one that gathers meaning through wear, touch, and repetition.[46] In this context, the jewellery becomes an active participant in the research, shaped by bodily engagement and individual narrative.[47]

Jewellery holds a unique position in design as both personal ornament and cultural artefact. Its capacity to be worn, displayed, and passed between bodies and generations enables it to function simultaneously as intimate possession and public statement.[48] This duality makes it a powerful medium for material critique,

43 Danto, Arthur C. *The Transfiguration of the Commonplace: A Philosophy of Art*. Cambridge, MA: Harvard University Press, 1981.

44 Adam Geczy and Vicki Karaminas, *Fashion and Art* (London ; New York: Berg, 2013).
Geczy, A., & Karaminas, V. (2019). *Fashion installation: Body, space and performance*. Bloomsbury Visual Arts.

45 Kawamura, Yuniya. *Fashion-ology: An Introduction to Fashion Studies*. Oxford: Berg, 2005.

46 Sara Ahmed, The Cultural Politics of Emotion (Edinburgh: Edinburgh University Press, 2014).
Daniel Miller, The Comfort of Things (John Wiley & Sons, 2013).

47 Alfred Gell, Art and Agency (Clarendon Press, 1998).

48 GUZIN DIDEM TOKER, "Jewelry and Memories," Handle.net, September 28, 2023, http://hdl.handle.net/10589/150222.
Petra Ahde-Deal, Heidi Paavilainen, and Ilpo Koskinen, "'It's from My Grandma.' How Jewellery Becomes Singular," The Design Journal 20, no. 1 (November 18, 2016): 29–43, https://doi.org/10.1080/14606925.2017.1252564.
Tiffin, S. (2010). "Adornment and Identity: The Role of Jewelry in the Construction of Meaning." Journal of Material Culture, 15(3), 329-347.

sustainability discourse, and narrative communication.[49] As a site of critical design, artisanal jewellery can interrogate ideas of value, waste, and authorship, allowing a duality between preciousness and wastage. In a waste-led[50] design context, the transformation of discarded, marginal materials into hand-crafted pieces of adornment challenges aesthetic and material norms while inviting new forms of engagement.[51] In this way, jewellery becomes a wearable act of storytelling and provocation.

Designers like Vivienne Westwood[52] have long used jewellery and accessories to disrupt conventions—using symbols of rebellion to critique the very systems of fashion they operate within,[53] especially during the punk movement as a form of activism.[54] Her work offers an important precedent for understanding how adornment can serve as meaningful political statement as much as personal decoration.

Crafting Slowness: Artisanal Values in Jewellery

While not all jewellery is artisanal, Pippa Small's approach exemplifies how handcrafted jewellery supports intentionality and ethical practices.[55] This artisanal nature of jewellery prioritises slowness, care, and quality over automated production. This mode of making not only supports the ethical values embedded in sustainability discourses but also strengthens the relationship between maker, material, and wearer. In contrast to garments, which are often short-lived in fast

49 Dodd, L. (2007). "Jewellery and the Body: Art, Metaphor, and Meaning." *Journal of Contemporary Ethnography, 36*(5), 597-617.
Hughes, M. (2018). "The Meaning of Jewelry: Emotional Connections and Symbolic Significance." *International Journal of Sociology of Fashion, 15*(2), 45-62.

50 Steffen Lehmann and Robert Crocker, *Designing for Zero Waste : Consumption, Technologies and the Built Environment* (London: Routledge, 2012).
Waste-led design focuses on repurposing discarded materials, extending product life cycles, and reducing environmental impact through creative practice.

51 Alastair Fuad-Luke, *Design Activism*, 2013, https://doi.org/10.4324/9781849770941.
Anthony Dunne and Fiona Raby, *Speculative Everything* (MIT Press, 2024).

52 While exerting a fashion design profession that inevitably cause to produce waste, she still promotes and encourages a better fashion consumption through sustainable discourse.

53 Perry, P. (2013). "Jewelry and the Social Significance of Wealth and Status." Fashion Theory, 17(3), 211-232.
Nixon, S. (2012). "Fashion as a Means of Resistance: Punk, Anti-Fashion, and Critical Fashion." In Fashion and Anti-Fashion: An Anthropology of Fashion (pp. 57-72).
Cunningham, P. (2010). "Fashion, Protest, and Identity: Punk, Anti-Fashion, and Critical Fashion." Textile: The Journal of Cloth and Culture, 8(3), 348-367.

54 Rivett, D. (2011). "Punk Rock and the Politics of Fashion." In Fashion and Politics, ed. by D. B. Crang, L. Kroes, 77-91.
Srinidhi Madurai K, "The Punk Movement: Rebellion and Subversion in Fashion - Fashion Law Journal," fashionlawjournal.com, September 7, 2023, https://fashionlawjournal.com/the-punk-movement-rebellion-and-subversion-in-fashion/.

55 Pippa Small, a renowned jewellery designer, has dedicated over 20 years to supporting traditional communities globally with sustainable and ethical practices.

fashion cycles—average lifetime is about 3-4 years according to W. Gwozdz et al. study,[56] jewellery typically maintains longer lifespans, stronger emotional attachments, and greater material durability, reflecting symbolic investment.[57] Pippa Small's work underscores the value of artisanal jewellery in fostering emotional connections and supporting sustainable practices. This property makes it an object that can be worn significantly more than any other kind of body covering.

These critical dimensions of jewellery practice including recovery and re-contextualisation of industrial remnants aim to question what we discard, why we discard it, and how we might reassign worth or meaning. This makes it particularly suited for engaging with issues of disposability and value in the fashion industry. As the next section explores, these concerns resonate across the practices of a growing number of contemporary waste-led designers and brands who are using artisanal jewellery—and related rigid media—as a wearable site of experimentation, storytelling, and sustainability.

Waste-led Design in Contemporary Jewellery Practice

Upcycled Narratives: Commercial Case Studies

ARTICLE22

ARTICLE22 exemplifies the transformative and narrative potential of non-virgin materials in impactful contemporary jewellery design. Founded in 2010, the brand collaborates with Laotian artisans to repurpose unexploded bombs remnants from the Vietnam War into handcrafted pieces, notably the Peace Bombs collection. These designs fuse materiality, identity, and strong storytelling, transforming fragments of war into symbols of peace and resilience. By embedding historical and socio-political narratives into each object, ARTICLE22 positions jewellery as

56 Wencke Gwozdz, Kristian Steensen Nielsen, and Tina Müller, "An Environmental Perspective on Clothing Consumption: Consumer Segments and Their Behavioral Patterns," *Sustainability* 9, no. 5 (May 6, 2017): 762, https://doi.org/10.3390/su9050762.
Gwozdz, Wencke, et al. "Environmental Impact of Online vs. In-Store Shopping in Fashion." *Journal of Retailing and Consumer Services*, 2017.
57 Guzin Didem Toker, "Jewelry and Memories," *Handle.net*, September 28, 2023, http://hdl.handle.net/10589/150222.
Petra Ahde-Deal, Heidi Paavilainen, and Ilpo Koskinen, "'It's from My Grandma.' How Jewellery Becomes Singular," *The Design Journal* 20, no. 1 (November 18, 2016): 29–43, https://doi.org/10.1080/14606925.2017.1252564.
Perry, P. (2013). "Jewelry and the Social Significance of Wealth and Status." *Fashion Theory, 17*(3), 211-232.

both artefact and activism, aligning with principles of Design Activism,[58] where design becomes a medium for social and environmental change. The initiative not only highlights the brutal legacy of conflict but also contributes to land demining efforts and community empowerment in Laos. Their name, drawn from the UN Universal Declaration of Human Rights, reinforces a commitment to human dignity. Through this model, ARTICLE22 demonstrates how sourcing and recontextualizing waste can generate powerful cultural meaning and reframe the societal role of adornment.[59]

Figure 2. Article22 Website Visual Communication and Products, (Screenshots from website, 2025).

58 Alastair Fuad-Luke, *Design Activism*, 2013, https://doi.org/10.4324/9781849770941.

59 "Peacebomb Story," Article22.com, n.d., https://article22.com/pages/peacebomb-story.
So far, they have contributed to clearing over 13 000m^2 of contaminated land from explosive device/chemical weapon presence.

Clara Besnard

Clara Besnard's jewellery practice operates at the intersection of speculative design and Critical Fashion Practice, challenging dominant and traditional narratives around waste and sustainability. By transforming discarded eyewear frames into gender-neutral jewellery, Besnard critiques the often-invisible processes behind material reuse, drawing attention to the overlooked complexities of recycling systems. Her work maintains the narrative integrity of recycled materials, preserving their visual identity while reimagining their function and value. This approach echoes the principles of upcycling and modularity, which prioritise the extended lifecycle and adaptability of materials within a design context. Through innovative and wearable forms that merge aesthetic refinement with material transparency, Besnard's jewellery communicates a deeper understanding of waste and its embedded potential as a cultural and material construct. Her practice ultimately questions the fashion system's linear logic and offers an alternative where non-virgin materials are not only viable but also desirable, demonstrating how sustainability can be embedded in both form and narrative.[60]

60 Clara Besnard, "Clara Besnard," Clara Besnard, 2019, https://www.clarabesnard.com/.

Figure 3. Clara Besnard Jewellery Work and Designs with Eyewear Waste, (Screenshots from website, 2025).

Curated Platforms for Sustainable Jewellery

Museum of Art & Design (MAD), NYC

Museum of Arts and Design (MAD, NYC) regularly hosts exhibitions showcasing designers who use sustainable materials. Through these public engagements, such as the "LOOT: MAD About Jewelry" exhibitions, MAD not only displays cutting-edge jewellery that employs upcycled materials but also educates the public on the complexities of the recycling system. This kind of exhibition works as an extension of Design Activism, using jewellery to provoke awareness and inspire change on a larger scale, while also advocating for modular design strategies and circularity. Contemporary artists like Deirdre Maine, who repurposes wine bottles, and Ann Cox, who transforms recycled glass—from lightbulb company waste she is collaborating with, demonstrate the innovative use of reclaimed/non-virgin materials in jewellery design.[61]

61 "MAD about Jewelry 2024," Madmuseum.org, 2024, https://madmuseum.org/jewelry/mad-about-jewelry-2024.
"MAD about Jewelry 2023," Madmuseum.org, 2023, https://madmuseum.org/jewelry/mad-about-jewelry-2023.
Other interesting mentions: Jianhui (uses recycled and upcycled materials), Anna Bonino (uses books waste), Isabelle Azais (uses plastic collected in city), Deborah Beck (uses single used plastic litter).

Figures 4 & 5. Ann Cox and Deirdre Maine Upcycled Product Examples, (Screenshots from websites, 2025).[62]

Research Through Practice: Academic Contributions

Alongside commercial initiatives, upcycling and material reuse have become significant themes in academic design research. Scholars such as Luciana Souza Penaforte and Zoe Zi Yi Yin use jewellery to explore the potential of non-virgin materials, offering diverse responses to sustainability challenges. Reet Aus's doctoral work further expands this discourse by focusing on industrial upcycling and supply chain traceability. Together, these practitioners show how research through creative practice can challenge dominant models of waste and promote circular approaches in fashion.

62 "Ann Cox," Anncox.be, 2025, https://www.anncox.be/.
"Deirdre Maine," deirdre maine, 2025, https://www.deirdremaine.com/.

Reet Aus & Industrial Upcycling

Reet Aus is a leading figure in industrial upcycling, with a practice centred on material traceability and the integration of sustainable processes within large-scale supply chains. Although her work operates on a different scale from the artisanal focus of this research, it underscores the value of circularity and systemic intervention in the fashion industry. Aus's initiatives illustrate how industrial models can support sustainability at scale and offer a useful counterpoint to small-scale practices. However, this thesis is primarily concerned with individual, craft-based approaches, which allow for more direct material engagement and narrative exploration—characteristics that define the works of designers featured in this study.[63]

Zoe Zi Yi Yin

Zoe Zi Yi Yin's practice and research take a holistic approach to sustainability within the jewellery industry, addressing both environmental and social concerns. Working primarily with upcycled plastics and aluminium, Yin reimagines these non-virgin materials as viable alternatives to conventionally mined metals. Her practice not only explores the aesthetic and structural possibilities of these materials but also critiques the lack of transparency and clarity surrounding sustainability in independent jewellery design. Through this work, Yin contributes to the discourse of Critical Fashion Practice, advocating for greater accountability and innovation in material sourcing. Her emphasis on upcycling and material modularity aligns with broader calls for sustainable design strategies and offers an important perspective on how jewellery can evolve as both a craft and a communication tool.[64]

63 Trash to Trend : using upcycling in fashion design : doctoral thesis, Reet Aus, PhD, 2011.

64 Harriet Zoe Yin, "Sustainable Jewellery Practice: A Creative Approach to Communicate Sustainability," June 15, 2023, https://doi.org/10.32920/23503821.v1. J OCAD University, 2016.

Figure 6. Zoe Zi Yi Yin Brooches, (Screenshot from thesis, 2025).

Luciana Souza Penaforte

Luciana Souza Penaforte explores the creative potential of electronic waste—such as used CDs, computer hardware, and cables—through her Ecouture project, which transforms discarded technology into contemporary jewellery collections. Her practice highlights the aesthetic and functional possibilities of upcycling, positioning waste as a smart, desirable resource rather than a by-product of obsolescence. By converting overlooked materials into high-value wearable objects, Penaforte challenges dominant narratives around disposability and luxury, advocating for sustainable design rooted in circularity and material longevity. Her work contributes to a broader discourse on how non-virgin materials can be reimagined within fashion and jewellery to support environmentally responsible innovation.[65]

65 Souza Penaforte Luciana, "E-Couture. Renewable Jewelry : An Alternative Perspective for Handcraft Accessories," *Handle.net*, September 28, 2023, http://hdl.handle.net/10589/142354.

Figure 7. Luciana Souza Penaforte Resources and Final Product, (Screenshot from thesis, 2025).

Conclusion

This Contextual Review has grounded the project by examining the systemic challenges posed by apparel waste and setting the landscape and limitations of the current apparel recycling system—especially the underexplored fate of post-consumer hardware which are often excluded from circular recovery due to design inefficiencies and lack of data. It has explored potential sustainable design practices such as upcycling, and the room for artisanal jewellery as a tool in critical fashion discourse, highlighting key examples like ARTICLE22 and Clara Besnard who use waste materials to challenge conventional aesthetics and values.

The initial research question emerges from this contextual grounding: How might artisanal jewellery serve as a critical platform for material recovery and narrative reclamation, particularly in relation to overlooked post-consumer hardware? This study aims to explore that potential, contributing to sustainable fashion discourse through a focus on emotional durability, upcycling, and critical design. The following chapter outlines the methodology through which this investigation will unfold.

Methodology

Overview

This chapter outlines the methodological framework underpinning this research, which investigates how creative practice—particularly in jewellery and fashion design—can critically engage with underexplored waste streams in the apparel industry. The study adopts a hybrid methodological approach that integrates elements of both practice-led and practice-based research, framed within a constructivist paradigm.[66]

Creative making is positioned as both a method of inquiry and a generator of knowledge, with material experimentation and embodied engagement at the core of the process. This approach is supported by theories of design activism,[67] upcycling, and critical making,[68] which inform a waste-led practice aimed at exposing the limits of apparel recycling systems and challenging material hierarchies.

The methodology also draws on Donald Schön's theory of reflection-in-action,[69] recognising the design process as a site for real-time learning and problem-solving. Elements of Action Research[70] provide a flexible, cyclical structure for iterative development, enabling the research to evolve responsively through making, observing, and reflecting. This chapter is organised into key sections covering the research framework, design activism and waste-led methods, and the iterative action cycles that structure the practice.

66 Candy, L. (2006). *Practice-based research: A guide*. University of Technology, Sydney.
Graeme Sullivan, *Art Practice as Research* (SAGE, 2005).
Bolt, B. (2006). A Non Standard Deviation: Handlability, praxical knowledge and practice led research. *Speculation and Innovation: Applying practice led research in the creative industries*.

67 Fuad-Luke, A. (2009). *Design activism: Beautiful strangeness for a sustainable world*. Earthscan. https://doi.org/10.4324/9781849770941.

68 Kyungeun Sung, Jagdeep Singh, and Ben Bridgens, *State-of-The-Art Upcycling Research and Practice Proceedings of the International Upcycling Symposium 2020* (Cham: Springer International Publishing : Imprint: Springer, 2021).
Trash to Trend : using upcycling in fashion design : doctoral thesis, Reet Aus, PhD, 2011
Anthony Dunne and Fiona Raby, *Speculative Everything* (MIT Press, 2024).
Ratto, M. (2009). Critical making: Conceptual and material studies in technology and social life. *The Information Society, 27*(4), 252–260. https://doi.org/10.1080/01972240903187064

69 McNiff, J., & Whitehead, J. (2006). All you need to know about action research. Sage.
Donald A. Schon, "The Reflective Practitioner: How Professionals Think in Action.," Administrative Science Quarterly 32, no. 4 (December 1983): 614, https://doi.org/10.2307/2392894.
If Schon's works were meant in a more organisational context (and could be considered outdated), author Isabelle M.M.J. Reymen in RESEARCH ON DESIGN REFLECTION: OVERVIEW AND DIRECTIONS, 2003, mentions his name as being the first contributor, followed by others like Stumph & McDonnel, or Valkenburg, to the increase of interest for design reflection in a context of design research

70 Chris Argyris, Robert Putman, and Diana McLain Smith, *Action Science* (Jossey-Bass, 1985).

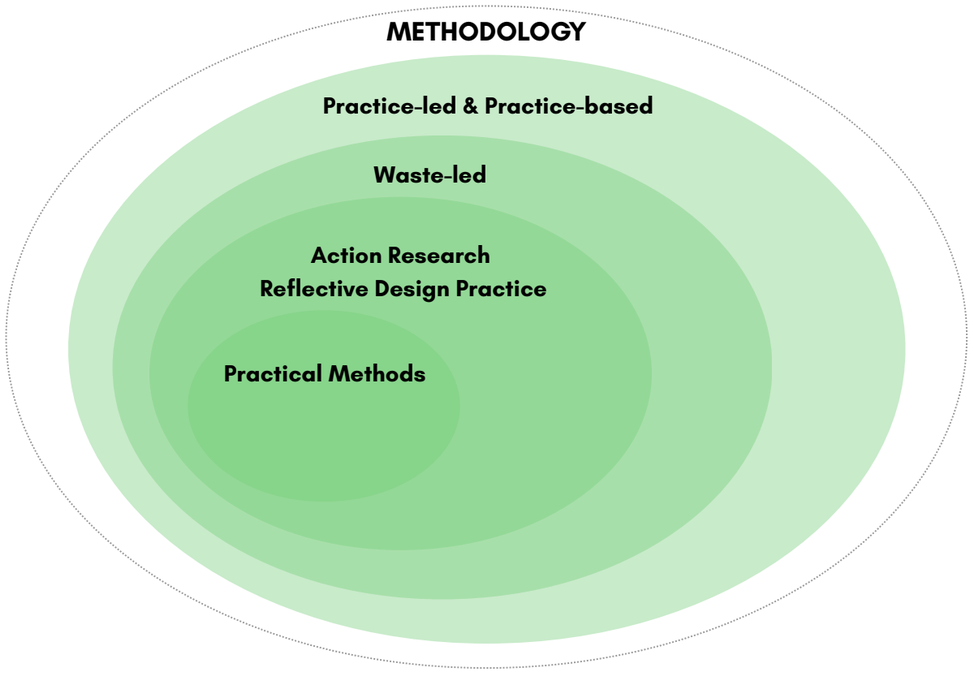


Figure 8. Methodology Layers (Alix Vital, 2025).

Research Framework

Practice-led & Practice-based

This project integrates both practice-based and practice-led research approaches to explore the recontextualization of post-consumer hardware waste into modular, wearable artefacts. Following Candy's definition,[71] the practice-based component positions the creative work—the jewellery pieces themselves—as central to the production of knowledge. These artefacts function not merely as illustrations of a process but as research outputs, embodying insights about waste, material agency (possibility that things can act), and design potential. The material experimentation, prototyping and resulting forms are thus a key part of the thesis' contribution to knowledge. Simultaneously, the research is practice-led, using the act of making to interrogate broader questions surrounding sustainability, consumption, waste and value hierarchies in fashion. This form of inquiry supports that knowledge emerges not only from outcomes but from the reflective process of designing and doing.[72] Journals, sketches, video documentation, and material tests form a critical framework for capturing the evolution of the research and the shifts in conceptual and material focus—initially through accessories, then refined into hardware and body adornment.

The intention is to use creative practice to explore how apparel discarded materials—particularly rigid hardware—can be repositioned as meaningful, adaptable, and wearable objects. These artefacts aim to challenge conventional material hierarchies: what is considered valuable, usable, or desirable in fashion and jewellery design. This includes questioning the privileging of 'virgin'[73] materials over waste, and fashion systems that devalue items due to changing trends or bodily norms.

By combining these two approaches, the project ensures that both creative output and critical reflection are recognised as modes of research. The artefacts become sites of inquiry, while the iterative design process produces theoretical and practical knowledge. This hybrid model allows the research to contribute to the fields of waste-led design, critical fashion, and sustainable material futures through both tangible and discursive outcomes.

71 Candy, L. (2006). Practice-based research: A guide. University of Technology, Sydney.
Linda Candy is a researcher with an enduring interest in how practitioners think and create works, principal area of expertise is in creative work, computer support and practice based research in the arts and sciences.

72 Bolt, B. (2006). A Non Standard Deviation: Handlability, praxical knowledge and practice led research. *Speculation and Innovation: Applying practice led research in the creative industries*.
Barbara Bolt, "The Magic Is in Handling," in *Practice as Research: Approaches to Creative Arts Enquiry*, eds. Estelle Barrett and Barbara Bolt (London: I.B. Tauris, 2007), 27–34.
Graeme Sullivan, *Art Practice as Research* (SAGE, 2005).

73 Brand new, remained unused material.

Waste-led Design & Circularity

The primary focus and main condition of this study is a waste-led design methodology,[74] which employs future material speculation by treating discarded and unconventional materials not only as a resource, but also as a medium and a message—echoing McLuhan's[75] assertion that the medium itself shapes and defines meaning. Through practice-based experimentation, post-consumer hardware is reimagined as primary resources for new artefacts, where waste becomes not a constraint but a creative catalyst, leading the artisanal practice and building a storytelling through waste.

Circular Economy in Practice

Aligned with circular economy principles, the project embraces reuse and transformation as tools to maintain material value over time.[76] Transformation techniques involve reshaping industrial materials into customisable wearable elements, often redefining their original use. Through this lens, the alteration of post-recovery workwear waste into wearable pieces informs on recycling limitations and possibilities, while questioning material hierarchies, waste value and politics.[77]

Upcycling as Critical & Speculative Practice

Upcycling functions here as both a material and critical method, challenging value hierarchies that define what is worth preserving. Through narrative-based design,[78] signs of previous use—scratches, marks, or irregularities—are retained and embraced, reflecting the material's past life while being repurposed. In the speculative dimension of critical making,[79] the work imagines alternative material futures, saving it from a landfill fate.[80]

Modularity & Design for Longevity

Modularity is a foundational concept in this research. Modular design system approaches emerge as a strategy to deal with obsolescence of frozen pieces.[81] Developing adaptable systems allows parts to be combined, rearranged, and transformed—both aesthetically and functionally, welcoming custom for human complexity and uniqueness.[82] The integration of modularity and object evolution aligns with Simondon's theory of the open object[83]—one whose relevance is extended through adaptability and transformation. This contributes to a design for longevity ethos,[84] prioritising emotional durability[85] and reconfiguration over trend-driven disposability. This slowness, care and intentionality of the process align with craftmanship values, giving more significance to the pieces.

74 Steffen Lehmann and Robert Crocker, Designing for Zero Waste : Consumption, Technologies and the Built Environment (London: Routledge, 2012).

75 Marshall Mcluhan, Understanding Media: The Extensions of Man (Createspace Independent Publishing Platform, 1964, Republised, 2013).

76 McDonough, W. and Braungart, M. (2002) Cradle to Cradle: Remarking the Way We Make Things. North Point Press, New York.
Ellen MacArthur Foundation. (2017). A New Textiles Economy: Redesigning Fashion's Future.

77 This waste-led process draws on my professional experience in industrial prototyping within a luxury fashion house, where I first became attentive to the overlooked value of hardware waste in the manufacturing cycle.

78 M. Carolyn Clark and Marsha Rossiter, "Narrative Learning in Adulthood," New Directions for Adult and Continuing Education 2008, no. 119 (June 2008): 61–70, https://doi.org/10.1002/ace.306.

79 Kyungeun Sung, Jagdeep Singh, and Ben Bridgens, State-of-The-Art Upcycling Research and Practice Proceedings of the International Upcycling Symposium 2020 (Cham: Springer International Publishing : Imprint: Springer, 2021).
Matt Ratto, "Critical Making: Conceptual and Material Studies in Technology and Social Life," *The Information Society* 27, no. 4 (July 2011): 252–60, https://doi.org/10.1080/01972243.2011.583819.

80 Trash to Trend : using upcycling in fashion design : doctoral thesis, Reet Aus, PhD, 2011.

81 Thackara, J. (2011) 'Into the Open'. In van Abel, B., Klaassen, R., Evers, L. and Troxler, P. (eds) Open Design Now: How Design Can No Longer Be Exclusive. Book Industry Services, Amsterdam, pp42–45.
Elisabeth Jayot, "A Designer Contribution to the Use of CNC Machines within the Supply Chain in Order to Extend Clothing Life Span," Technology-Driven Sustainability, August 14, 2019, 27–55, https://doi.org/10.1007/978-3-030-15483-7_3.

82 Costume history is full of examples of ingenious uses of removable, reversible and modular systems allowing easy replacement of used parts or changes of appearance at will.

83 Gilbert Simondon, On the Mode of Existence of Technical Objects, 1980.

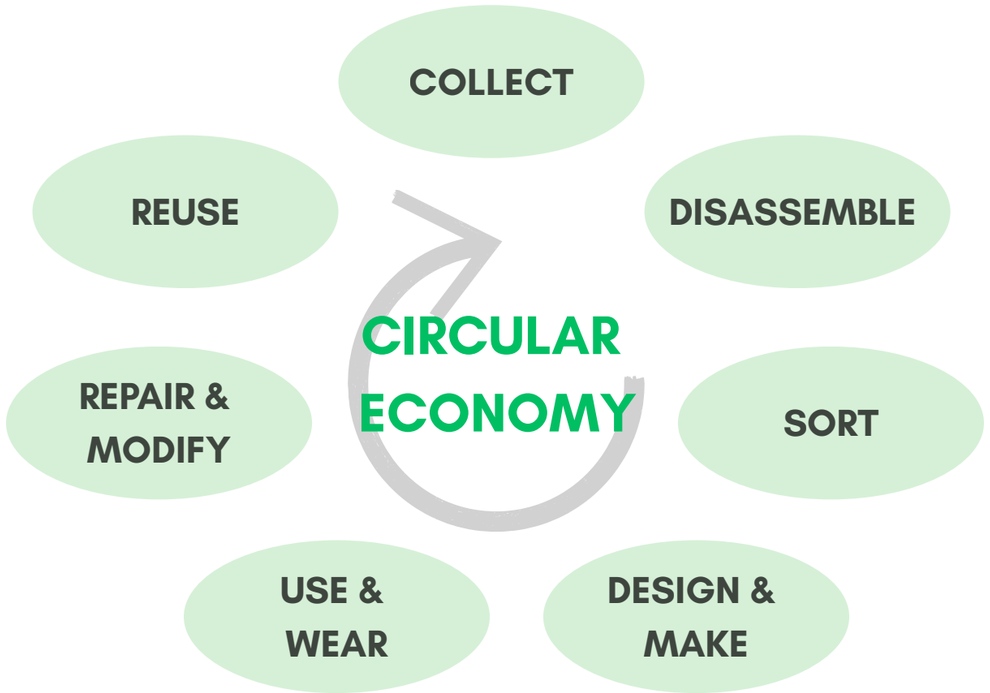
84 Aligning with Bakker et al. (2019) out of six specific design strategies, mine will be; Design for Attachment and Trust, Design for Durability, Design for Adaptability and Upgradability, and Design for Dis- and Reassembly.
Bakker, C., Wang, F., Huisman, J., Den Hollander, M. (2014), "Products that go round: exploring product life extension through design", Journal of Cleaner Production, vol. 69, pp. 10–16. https://doi.org/10.1016/j.jclepro.2014.01.028
van den Berg, Maarten R., and Conny A. Bakker. 2015. "A Product Design Framework for a Circular Economy." Proceedings of the PLATE Conference.
Carlsson, S., Pal, R., Hakkarainen, E., & Gylling, A. C. (2021). Design for longevity – A framework to support the designing of a product's optimal lifetime. Proceedings of the Design Society, 1, 1003–1012. https://doi.org/10.1017/pds.2021.100
Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning Fashion's Future.
WRAP (Waste and Resources Action Programme) (2013). Designing Products for a Circular Economy.

85 Chapman, J. (2005). Emotionally durable design: Objects, experiences and empathy. Earthscan.

Extended Producer Responsibility (EPR)

As part of a practice-based approach, this study engages with an Extended Producer Responsibility (EPR) framework with materials such as discarded textiles and post-industrial clothing waste to develop upcycled body adornment. Key research methods include testing EPR-designated waste materials for aesthetic and structural transformation in jewellery and fashion design and collaborating with textile recyclers and second-hand retailers to assess material flows.

While full circularity remains difficult to achieve particularly when working with mixed-material, post-consumer waste, and small-scale resources, the research exposes infrastructural limits and offers wearable, critical interventions that reframe waste as both valuable and communicative, empathizing the tension between ideal circular systems and real-world design limitations.



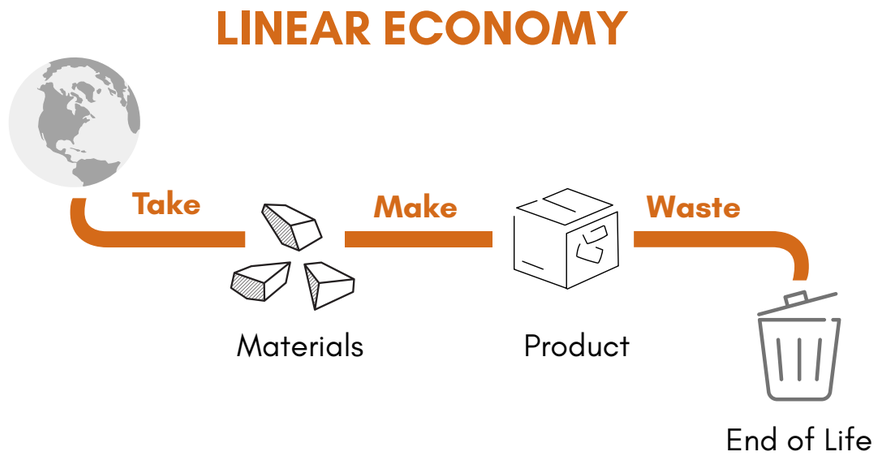


Figure 9 & 10. Simplified (Ideal) Circular Design Loop in Waste-led Practice in Comparison & Simplified Linear Economy; the 'Take, Make and Waste' Approach, (Alix Vital, 2025 and Alix Vital, adapted from Gotzone Barandika et al., 2025).[86]

86 Gotzone Barandika et al., "THE CIRCULAR ECONOMY CONCEPT in the FORMATION of EIDOS DOCTORATES (UPV/EHU)," EDULEARN17 Proceedings, March 2017, https://doi.org/10.21125/edulearn.2017.0523.

Design Activism & Critical Fashion & Art Practices

Design Activism[87] (DA), Critical Fashion Practice[88] (CFP), and art-fashion are central aspects to this research methodology, each providing a means to engage with systems of waste and material value. Rather than focusing solely on aesthetics or utility, the creative work critiques existing apparel recycling systems and reveals overlooked complexities within industrial waste cycles. Drawing from art-fashion as a methodological approach,[89] the study situates fashion as a form of critical design and artistic inquiry, where garments and adornment become mediums for cultural intervention. As such, design functions not only as a tool for making, but as a vehicle for speculation, critical reflection, and public engagement.[90]

In line with DA, this research uses material artefacts to communicate unseen, difficult-to-recycle waste—as evidence of the disconnection between circularity ideals and the realities of apparel hardware recycling. The body-worn format of the jewellery plays a key role, allowing the artefacts to enter social space and provoke reflection through their form, materials, and tactility. This approach draws from art-fashion's emphasis on performativity and disruption,[91] where fashion operates in public space as both symbolic and material critique. The use of waste as material aligns with performative practices in art-fashion that challenge traditional narratives of luxury, value, and perfection.[92] The activism coded position of the work into practice, relies on subtle but intentional interventions to challenge consumer awareness, habits and assumptions about waste.

This methodology is also informed by practitioners such as Vivienne Westwood, whose work exemplifies art-fashion and anti-fashion and the spirit of punk as artistic and political performance—blending material reuse, subcultural aesthetics, and provocation to challenge dominant systems of production and

87 Fuad-Luke, A. (2009). *Design activism: Beautiful strangeness for a sustainable world*. Earthscan.
88 “Critical Fashion Project. (2017). What is critical fashion practice? https://www.criticalfashionproject.org/text/what-is-critical-fashion-practice/
89 Geczy, A., & Karaminas, V. (2019). *Fashion installation: Body, space and performance*. Bloomsbury Visual Arts.
90 Alastair Fuad-Luke, Design Activism, 2013, https://doi.org/10.4324/9781849770941.
Thomas Markussen, “The Disruptive Aesthetics of Design Activism: Enacting Design between Art and Politics,” Design Issues 29, no. 1 (2013): 38–50, https://www.jstor.org/stable/24267101.

91 Geczy, A., & Karaminas, V. (2019). Fashion installation: Body, space and performance. Bloomsbury Visual Arts.
Adam Geczy and Vicki Karaminas, Fashion and Art (London ; New York: Berg, 2013).

92 Alison Gwilt and Timo Rissanen, Shaping Sustainable Fashion : Changing the Way We Make and Use Clothes (London: Earthscan, 2011).

consumption.[93] Similarly, designers like Maison Martin Margiela and Rei Kawakubo have employed deconstruction and unconventional materials to reframe fashion as an ongoing critique of aesthetic norms and consumer culture. Within this lineage, the current research uses art-fashion not merely as inspiration but as a critical framework for making, one that embraces ambiguity, contradiction, and visual tension to expose deeper environmental and social issues.

Through a CFP and art-fashion lens, the jewellery produced in this research resists normative ideals of fashion and adornment. The designs intentionally retain traces of their origin—visible wear, industrial hardware, non-virgin condition—not to aestheticise waste, but to disrupt conventional beauty narratives and prompt critical questioning. As Karaminas argues,[94] art-fashion allows for fashion to operate outside commercial logic, instead privileging conceptual depth, cultural commentary, and artistic process. This methodological approach relies on speculative making to explore new material futures and position design as a mode of research and resistance.[95]

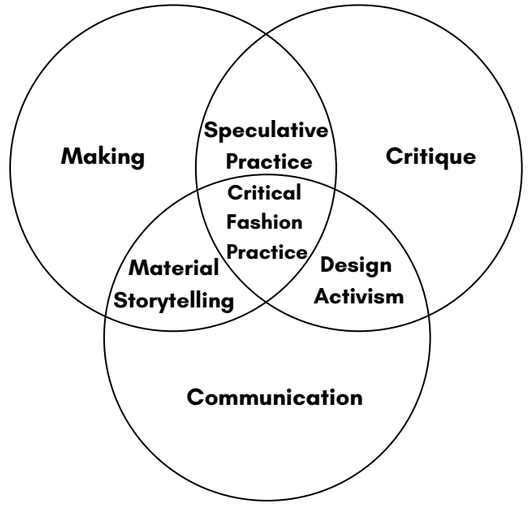


Figure 11. Venn Diagram of CFP, (Alix Vital, 2025).

93 Nixon, S. (2012). "Fashion as a Means of Resistance: Punk, Anti-Fashion, and Critical Fashion." In Fashion and Anti-Fashion: An Anthropology of Fashion (pp. 57-72).
Cunningham, P. (2010). "Fashion, Protest, and Identity: Punk, Anti-Fashion, and Critical Fashion." Textile: The Journal of Cloth and Culture, 8(3), 348-367.
Geczy, Adam and Karaminas, Vicky. Critical Fashion Practice: From Westwood to van Beirendonck. London: Bloomsbury Academic, 2017.

94 Adam Geczy and Vicki Karaminas, *Fashion and Art* (London ; New York: Berg, 2013).

95 Dunne, A., & Raby, F. (2013). *Speculative Everything: Design, Fiction, and Social Dreaming*. MIT Press.
Maria Laura Parisi et al., “Life Cycle Inventories Datasets for Future European Electricity Mix Scenarios,” Data in Brief 30 (June 2020): 105499, https://doi.org/10.1016/j.dib.2020.105499.

Action Research & Reflective Design Practice

This research also combines Action Research (AR) with Reflective Design Practice (RDP), supporting a responsive, iterative approach to material experimentation and critical making. Originally rooted in the social sciences,[96] Action Research is characterised by its cyclical structure of planning, acting, observing, and reflecting, which enables researchers to intervene in real-world contexts while simultaneously generating knowledge and allows a design critical evolution.[97]

In design research, AR has been increasingly applied to facilitate practical experimentation, theory development, and systemic critique.[98] Its strength lies in enabling designers to adapt to emergent discoveries, allowing changes in directions, and to view 'failures' (unsuccessful results) as productive steps toward better-informed outcomes.[99] In this context, the Action step is the Making. For this project, AR supports a non-linear and adaptive methodology, particularly suited to the complexities of working with waste as a design resource.

Each cycle of the research involves identifying challenges in material recovery and transformation, designing interventions through prototyping and making, and reflecting on outcomes via journaling, sketching, exhibiting, and wearing. This process allows for iterative improvement while remaining grounded in critical engagement with the broader systems of apparel waste, fashion sustainability, and material value. The rhythm of AR supports a critical, flexible, and creative approach to waste-led design.[100]

96 Kurt Lewin, "Action Research and Minority Problems," Journal of Social Issues 2, no. 4 (November 1946): 34–46, https://doi.org/10.1111/j.1540-4560.1946.tb02295.x.
Since its origins in the social sciences in the mid-20th century, Action Research has evolved into a widely adopted methodology within design disciplines. Its iterative, participatory structure aligns with the creative and exploratory nature of design processes, making it especially relevant for contemporary research that addresses complex, real-world challenges and a valuable framework in design contexts focused on sustainability, user-centred innovation, and critical material practices (Swann, 2002; Muratovski, 2016).

97 Gjoko Muratovski, Research for Designers (SAGE, 2021).
Christopher Crouch and Jane Pearce, Doing Research in Design (London: Berg Publishers, 2013).
Cal Swann, "Action Research and the Practice of Design," Design Issues 18, no. 1 (2002): 49–61, https://www.jstor.org/stable/1512029.
Tegan George, "What Is Action Research?," Scribbr, January 27, 2023, https://www.scribbr.com/methodology/action-research/.
Chris Argyris, Robert Putman, and Diana McLain Smith, Action Science (Jossey-Bass, 1985).

98 Cal Swann, "Action Research and the Practice of Design," Design Issues 18, no. 1 (2002): 49–61, https://www.jstor.org/stable/1512029.
99 Gjoko Muratovski, Research for Designers (SAGE, 2021).

100 The benefit of multiple iterations is to gradually develop an understanding of both problem and solution space. This space and time related method also develops and evaluates design knowledge.
Venable, J.: The role of theory and theorising in design science research. In: First International Conference on Design Science Research in Information Systems and Technology (2006).

To further articulate the evolving and responsive nature of the methodology, the AR cycle is paired with a RDP framework, influenced by Schön's concept of "reflection-in-action", critically tying the different AR steps. Swann discusses the use of reflection-in-action as a design method. This dimension acknowledges the embedded, intuitive, and often tacit knowledge that emerges through making and responding to materials in context. It foregrounds critical awareness within the process and positions the designer not only as a maker, but as a reflective agent.

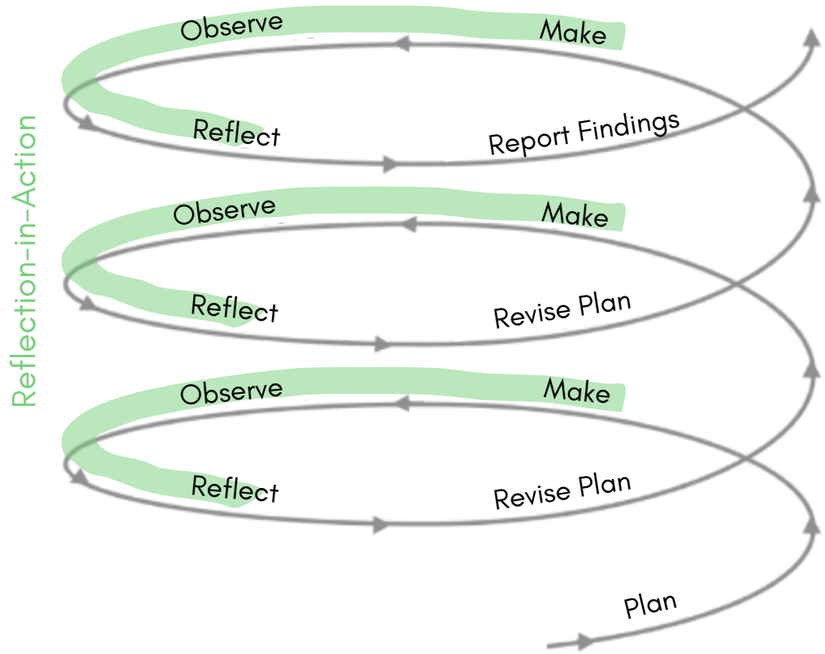


Figure 12. Action Research Cycles, (Alix Vital, Adapted from Lisa McEwan's model, 2025).[101]

Each phase of the cycle is addressed using specific tools, here called Design Methods.

101 Based on AR model: Lisa McEwan, "Trade Secrets: The Design, Implementation and Analysis of a Prototype Workshop, Aimed at Facilitating Knowledge Transfer within the Emerging-Designer Sector of the New Zealand Fashion Industry," Auckland University of Technology Master of Design (2011).

Design Phases and Methods

This section outlines the practical methods used to support the iterative development of the project within the framework of Action Research (AR) and practice-led design. These methods facilitated creative exploration, critical reflection, and responsive adaptation throughout the research process. Tools such as sketching, brainstorming, mood boards, and material testing were employed to externalise ideas, guide aesthetic direction, and evaluate conceptual and functional outcomes. Together, these methods enabled a continuous dialogue between making and thinking, grounding the work in both material inquiry and reflective practice.

Discovery

The discovery phase occurred prior to the planning stage and laid the critical grounding for the design process. A foundational step in this methodology, consistent with both AR and Research through Design Practice, is the problem discovery phase. This phase establishes the contextual and theoretical grounding for the study by identifying relevant challenges, gaps, and opportunities within current design and recycling systems. A contextual review of existing literature and design precedents was undertaken to map current approaches to apparel waste, particularly focusing on hardware components. This included a comparative analysis of existing products, systems, and scholarly research to evaluate limitations and areas for innovation. As Vaughan notes, reviewing precedents is not merely about identifying what exists, but also about stimulating new possibilities through critical reflection and comparison.[102] Academic databases such as Google Scholar and institutional library search platforms were used to search for key terms including “recycling systems,” “apparel hardware,” and “circular fashion.” This phase ensured the identified problem is both timely and underexplored, validating the need for design intervention and guiding the subsequent stages of material experimentation and prototyping.

102 Vaughan, L. (2017). *Practice-based design research*. Bloomsbury Academic.

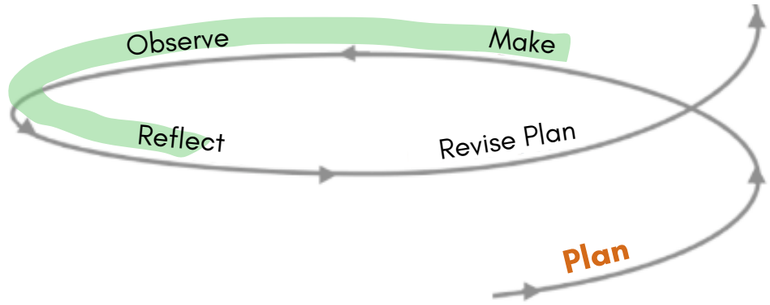


Figure 13. Action Research Iteration; Plan, (Alix Vital, 2025).

Plan

The first stage of the Action Research (AR) cycle involves setting direction through exploratory tools and intention-setting activities. This phase initiates the process of aligning conceptual objectives with visual and material inquiry, helping to define the scope and potential of the design intervention. Early-stage planning in this project used a variety of practical design methods to articulate the problem space, surface underlying assumptions, and begin shaping the aesthetic and functional parameters of the work.

TOOL	PURPOSE	OUTPUT TYPE
Brainstorming	Expand possible paths and concepts	Word clusters
Mind Mapping	Connect themes and concepts	Visual map
Mood Boards	Aesthetic tone & material direction	Visual collage
Sketching	Explore and externalise ideas	Freehand visuals
Position Graph	Contextualise within design landscape	Comparative matrix

Figure 14. Creative Thinking Tool Table, (Alix Vital, 2025).

Sketching & Brainstorming

Sketching can be used as a primary tool to generate, iterate, and externalise ideas.[103] It will support visual decision-making and will document transitions between concept and form. Brainstorming sessions will parallel this by allowing unfiltered idea capture, stimulating expansive thinking at the early stages of development.[104]

Mind Mapping

Mind mapping will help structure abstract themes such as waste value, circularity, and fashion critique. It will offer a dynamic and flexible visual overview of connections between ideas.[105]

Mood Boards

Mood boards will be employed to define the aesthetic and material tone of the research. By assembling textures, colours, and reference images, the boards will serve as an intuitive ideation tool, guiding early visual and conceptual directions.[106]

Position Graphs

Position graphs will be to compare and position this research relative to other critical fashion and practitioners, helping to identify gaps and affinities.[107]

103 Brock Craft and Paul Cairns, “Sketching Sketching: Outlines of a Collaborative Design Method,” September 1, 2009, 65–72, https://doi.org/10.5555/1671011.1671019.
Martina Schütze, Pierre Sachse, and Anne Römer, “Support Value of Sketching in the Design Process,” Research in Engineering Design 14, no. 2 (February 15, 2003): 89–97, https://doi.org/10.1007/s00163-002-0028-7.

104 Paul B Paulus and Huei-Chuan Yang, “Idea Generation in Groups: A Basis for Creativity in Organizations,” Organizational Behavior and Human Decision Processes 82, no. 1 (May 2000): 76–87, https://doi.org/10.1006/obhd.2000.2888.
Laura R. Murphy, Shanna R. Daly, and Colleen M. Seifert, “Idea Characteristics Arising from Individual Brainstorming and Design Heuristics Ideation Methods,” International Journal of Technology and Design Education, February 8, 2022, https://doi.org/10.1007/s10798-021-09723-0.

105 Mary Crowe and Liz Sheppard, Mind Mapping for Creative Design Thinking, Design Studies 31, no. 5 (2012): 471–87.

106 Diane McDonagh and Tim Storer, Mood Boards in Design Practice, Design Journal 7, no. 1 (2004): 16–30.

107 Cross, N. (2001). Designerly Ways of Knowing.
Cross, N. (2001). Designing Design. Design Issues, 17(2), 35-51

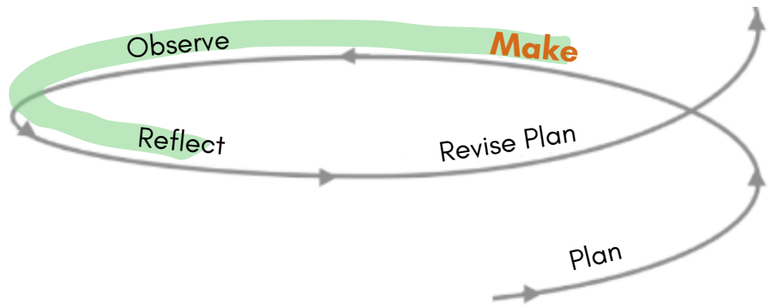


Figure 15. Action Research Iteration; Make, (Alix Vital, 2025).

Make

This crucial phase in practice-led research marks the transition from ideation to action, physical and material engagement. It corresponds to reflective practice through experimenting—where ideas are tested, challenged, and evolve through iterative processes.

Prototyping & Iterative Making

Prototyping will serve as a method to explore feasibility, material behaviour, and potential assembly strategies.[108] As Hallgrimsson notes,[109] it is “a thinking-through-making” process that helps test ideas in three dimensions. Early design prototypes and material experimentation will help assess which materials are workable, prompting the evolution of iterative cycles of adaptation and reflection. In the context of this research, given the unfamiliarity and irregularity of the waste components, prototyping will be crucial to develop a practical and intuitive understanding of their affordances. As an iterative making, prototyping will be used until the final artefacts are realised.

106 Diane McDonagh and Tim Storer, Mood Boards in Design Practice, Design Journal 7, no. 1 (2004): 16–30.

107 Cross, N. (2001). Designerly Ways of Knowing.
Cross, N. (2001). Designing Design. Design Issues, 17(2), 35-51

108 Bradley Camburn et al., “Design Prototyping Methods: State of the Art in Strategies, Techniques, and Guidelines,” Design Science 3, no. 13 (2017), https://doi.org/10.1017/dsj.2017.10.

109 Bjarki Hallgrimssom, Prototyping and Modelmaking for Product Design (HACHETTE UK, 2012).

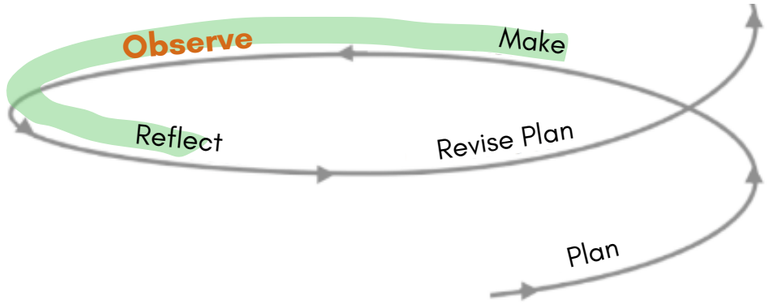


Figure 16. Action Research Iteration; Observe, (Alix Vital, 2025).

Observe

Observation acts as both documentation and reflection-in-action. It is indeed, closely followed and linked with the reflection phase, allowing the researcher to step back, record, and critically analyse the work as it develops. It also makes the process visible—to both future self and stakeholders (supervision and peers), bridging practice and communication. These reflections will be active tools rather than final judgements—prompting further iteration, material exploration, and clarity. The loop between making, observing, and reflecting will ensure that the work remains critical, intentional, and purpose driven.

Importantly, these reflective observations are not treated as conclusive assessments but as dynamic tools for prompting further experimentation, material refinement, and conceptual clarity. The iterative loop of making, observing, and reflecting ensures the work remains critically engaged, responsive, and purpose-driven throughout its development.

Journaling

Journaling will be a great method to record process notes, material experiments, and iterative outcomes. It will serve as an essential tool for tracking the evolution of prototypes,[110] combining visual records—such as photographs, sketches, videos, with written annotations. This method will offer transparency[111] and traceability across the project—ensuring that insights, successes, failures, and shifts in direction will be captured, documented and available for later analysis.[112] This journaling practice helped frame future reflection and supported consistent critical engagement throughout the making phases.

Curation & Display

Situated at the intersection of art and fashion, this research engages with adornment not only as a wearable object but as a vehicle for activism and public discourse. While the pieces are designed for bodily interaction, their critical potential also depends on visibility beyond the wearer. In line with the project's emphasis on design activism and critical fashion practice, the curated display of the work becomes a key methodological tool elevating the project's communicative capacity. A final public exhibition will serve as both an observational and reflective device, offering a platform to construct and present a visual narrative that extends the meaning of the work beyond function or aesthetics. Displaying the artefacts in a curated setting allows for broader engagement—enabling the viewer to encounter and interpret the work in relation to the material, social, and environmental contexts from which it emerged. As Fuad-Luke argues, critical design practice must be made publicly visible to foster dialogue and to challenge entrenched socio-material systems.[113] The exhibition thus forms an essential part of the research, contributing to its aim of provoking reflection, raising awareness, and questioning dominant fashion and waste paradigms through a multisensory, narrative-led experience.

110 Jepsen, L.O., et al.: Back to thinking mode: diaries for the management of information systems development projects. Behav. Inf. Technol. 8(3), 207–217 (1989). https://doi.org/10.1080/01449298908914552
Jan vom Brocke, Michael Gau, and Alexander Mädche, "Journaling the Design Science Research Process. Transparency about the Making of Design Knowledge," Lecture Notes in Computer Science, January 1, 2021, 131–36, https://doi.org/10.1007/978-3-030-82405-1_15.

111 Brocke, Jan vom, Alexander Simons, Bernd Niehaves, Kai Reimer, Ralf Plattfaut, and Alfred Roßnagel. "Bridging the Gap Between Enterprise Architecture and Legal Compliance: A Method and Model for Structuring and Analysing the Legal Domain." Information Systems Frontiers 11, no. 2 (2009): 139–165.

112 Messenger, Hazel. "Drawing out ideas: Visual journaling as a knowledge creating medium during doctoral research." Creative Approaches to Research 9.1 (2016): 129.
Messenger, Hazel. "The Use of Journals in Design Research as a Tool for Reflexivity." In The Routledge Companion to Design Research, edited by Paul A. Rodgers and Joyce Yee, 184–195. London: Routledge, 2015.

113 Fuad-Luke, Alastair. 2009. Design Activism: Beautiful Strangeness for a Sustainable World. London: Earthscan.

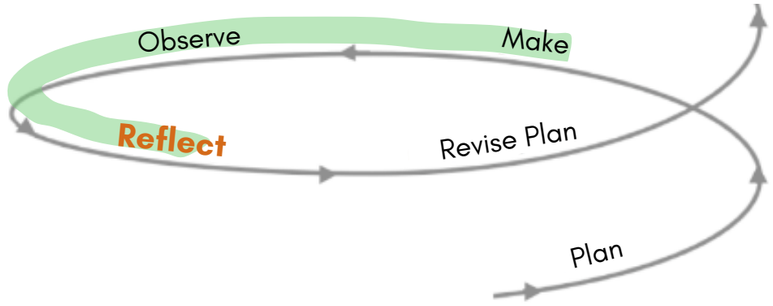


Figure 17. Action Research Iteration; Reflect, (Alix Vital, 2025).

Reflect

Reflection is central to my methodology as a mechanism to evaluate, redirect, and deepen the inquiry. Through this AR cycle context, and empathised by reflective practice, it identifies gaps, challenges assumptions, builds a storytelling and informs the next iteration of development.[114] Supported by structured and critical reflection-in-action, the work remains aligned with its original aims while evolving responsively. Importantly, these reflective observations are not treated as conclusive assessments but as dynamic tools for prompting further experimentation, material refinement, and conceptual clarity. The iterative loop of making, observing, and reflecting ensures the work remains critically engaged, responsive, and purpose-driven throughout its development.

Supervision Discussion

Reflection will be both individual and dialogic. While self-reflection is integral to the making process, regular discussions with my supervision will provide critical distance and alternative perspectives. This external feedback will help test the clarity and communicative strength of the work, while also sustaining momentum and reinforcing the project's core values.[115]

114 McKenney, Susan, and Thomas C. Reeves. Conducting Educational Design Research. London: Routledge, 2012.
Gregor, Shirley, and Alan R. Hevner. "Positioning and Presenting Design Science Research for Maximum Impact." MIS Quarterly 37, no. 2 (2013): 337–355.
Shirley Gregor, Oliver Müller, and Stefan Seidel, "Reflection, Abstraction and Theorizing in Design and Development Research," AIS Electronic Library (AISeL), 2025, http://aisel.aisnet.org/ecis2013_cr/74.
Dalsgaard, Peter. "Reflective Design Documentation." In Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems, 5149–5160. ACM, 2017.

115 Currano, Rebecca M., and Martin Steinert. "The Reflective Practitioner in Design Research: A Review of Reflexivity and Design." Design Studies 75 (2021): 100967

Evaluation Criteria

To systematically assess each prototype, tailored evaluation criteria will be developed to make visible what succeeded and where refinement was needed. These criteria will be based on key research priorities, including functionality, comfort and safety, aesthetic resolution, and communicative potential.

Conclusion

This chapter has outlined the methodological framework and practical methods underpinning the research, which adopts an iterative, practice-led approach grounded in Action Research. Anchored in cycles of discovery, prototyping, material experimentation, and reflection-in-action, the methodology supports an inquiry into material reuse and modularity, situated within the context of waste-led design and critical fashion practice.

A total of four action cycles structure the research, with each phase contributing uniquely to the development of both theoretical insight and practical output. The varying pace and focus of each cycle allow for an adaptive process, responsive to the complexities of post-consumer hardware waste and the evolving direction of the research.

The findings, artefacts, and insights emerging from each cycle will be presented in the following chapters, illustrating how the iterative design process informed the project's outcomes and its contribution to sustainable fashion discourse.

Project Inception

Resource Collection

I have always had a longstanding sensitivity to discarded objects and an intuitive recognition of the residual value embedded in waste. Before discarding damaged garments, I would often salvage hardware components—zippers, buttons, and metal fastenings—that retained a functional and aesthetic presence despite the obsolescence of the textile. This inclination extended into thrift shopping and was further shaped by experiences within the fashion industry, where I became increasingly aware of the hard, often overlooked waste generated.

Resource Collection - France

Prior to embarking on this project, I had undertaken an internship with a luxury leather-goods brand in France. During that internship I salvaged a collection of zipper teeth that were prototyping waste, created during the zipper shortening process at the bag sampling stage.[116]

Figure 18. Zipper Teeth Collection from former internship, (Alix Vital, 2023).

116 During the bag prototyping process, existing zippers are shortened to the correct length by manually removing excess zipper teeth with pliers, separating them from the the zipper tape fabric.

I initially anticipated that I would utilise this waste in my research. In early experiments, I explored potential redeployment of the zipper teeth into jewellery through ornamental composition onto transparent tape and soldering.

Figure 19. Initial explorations: zipper teeth prototypes, (Alix Vital, 2024).

These experiments were yet to be fully resolved when I began criticality reflecting on the origin of the waste material I was using. Although these zipper teeth were a waste product generated during sampling, I realised that once the bags were being made on the production line, the correct length zippers would be sourced, thereby eliminating this resource as a large scale waste stream. However, using them had deepened my awareness of industrial waste, and sparked further curiosity about the recycling and repurposing of these and other metal components from a range apparel industry sources.

Resource Collection - Tāmaki Makaurau Auckland

Given the location of the project in Aotearoa New Zealand, I elected to use entirely local apparel waste resources rather than waste from France. However much of New Zealand's apparel manufacturing occurs offshore, meaning that it would be difficult to source manufacturing waste. I decided to approach two local recycling organisations—ImpacTex, an apparel recycling company, and the Phoenix Recycling Group, nation-wide metal and e-waste recycling specialists. Phoenix offered to support my research with a variety of metal waste donations, however, all of the metal waste in their plant has the potential to be re-processed and resold,[117] so using these resources would have defeated the waste-led purpose of my work.

Collaboration - ImpacTex

ImpacTex is a commercial textile recovery and upcycling company based in Tāmaki Makaurau Auckland, in Aotearoa New Zealand. Specialising in post-use textiles, they extend the lifespan of discarded apparel and uniforms by converting them into 100% recycled and recyclable materials, including acoustic panels, signage, and corporate packaging.[118] By offering an alternative to single-use PVC and virgin plastics, ImpacTex plays a key role in advancing local circular material systems.

117 This reflects a broader issue highlighted in the Methodology, where Extended Producer Responsibility frameworks expose the tension between theoretical circularity and real-world material constraints.

118 "Textile Recycling | Retex | ImpacTex," impactex.nz, accessed June 5, 2024, https://impactex.nz/.

For streamlining purposes, ImpacTex presently recycles mainly denim clothing and workwear. A visit to the plant and discussions with staff highlighted the difficulty of managing embedded hardware such as rivets, buttons, and zippers. To ensure that that no hardware enters their soft-textile recycling process, ImpacTex workers remove zippers and plackets with snap fasteners by loosely cutting them out of garments. The company is constantly exploring options to recycle, reujse or recover, they had hoped to have these parts recycled through a partnership with Phoenix Recycling, however the metal being firmly attached to fabric also posed a difficulty for Phoenix—the presence of residual textiles rendering the waste incompatible with their post-recovery processes (which rely on clean inputs for magnetic separation), and separating the metal hardware from the fabric proving too labour intensive to be economically viable.[119]

These difficult to recycle, post-recovery metal elements became the primary resource in my practical research. By providing me with these materials, ImpacTex became a key partner in my project, enabling exploration of under-addressed waste streams and the material challenges that lie within textile recycling systems. This partnership, and the identification of a critical gap in the recycling chain, introduced real-world constraints that shaped design decisions and processes in my research.

Resource Selection

The resource collection phase of this project formed the foundation of my experimental work and was guided by a principle of material responsiveness rather than predetermined specifications. ImpacTex emerged as an ideal collaboration, providing access to discarded hardware (both metallic and plastic)—an exact yet initially undefined resource I was seeking. Rather than beginning with a fixed material or formal outcome in mind, the project was deliberately structured to evolve in response to the available materials. This openness enabled an adaptive approach to resource integration, with serendipitous discovery playing a critical role in material selection.

119 Ella Martin to, in person conversations and e-mails, 2024-2025

While unable to give a precise figure of how much metal they remove from textile, they have a 6% waste rate for all the textile they receive or for 100kg of garment. This includes hardware materials, but also contaminated fabric with foreign substances that cannot safely be recovered.
They also operate with the viable options available in New Zealand as they do not send materials overseas. This exploration work is ongoing and in the meantime, they love to connect with many local designers, repairers and upcyclers to utilise their hardware. This includes participants in the Circular Design Awards, university students and local fashion design brands.

Initial experimentation involved a wide range of hardware components. Through iterative prototyping and hands-on exploration, my attention was drawn to robust metal hardware, particularly elements that exhibited mechanical functionalities such as locking and unlocking. This marked a shift in focus from a broad material inquiry to a more refined interest in specific components. As a result, I began selectively incorporating metal snap fastener plates and metal fly zippers into the work, consciously excluding materials such as plastic hardware, buttons, denim, and elastic. The variety in finishes—especially the availability of both silver and gold tones—enriched the aesthetic possibilities of the project.

Figure 20. Given Primary Resources, ImpacTex, (Alix Vital, 2024).

Figure 20bis. Given Primary Resources, ImpacTex, (Alix Vital, 2024).

Early Prototyping & Reflection

After deciding to focus on the metal waste provided by ImpacTex, my practice went through a series of initial cycles before revealing the final direction of the research.

Cycle 1: Stitched Accessories

My initial approach involved repurposing the entirety of the materials received, specifically utilising the placket fabric surrounding metal snap fasteners. I connected the plackets through patchwork-style sewing, effectively creating new patterned surfaces. This approach was implemented in handbag and corsetry, with integrated snap fasteners not only serving as decorative accents, but also as active mechanisms to expand or compress the artifact, or to attach additional components, for example, handbags could be layered onto corsets, enabling modular, hands-free use.

Figure 21. Sewed Corset, (Alix Vital, 2024).

Figure 22. Sewed Handbag, (Alix Vital, 2024).

While these outcomes offered a strong visual identity and initial satisfaction, I realised that the work required the introduction of new sewing thread, and reflected that the hardware's functional capacities were only partially activated because using the unplanned fabric was dictating the outcomes. I also questioned the desirability of the outcomes, deciding, upon reflection, that they were not sufficiently compelling pieces. This prompted a shift toward deeper engagement with the functionality of the mechanical componentry.

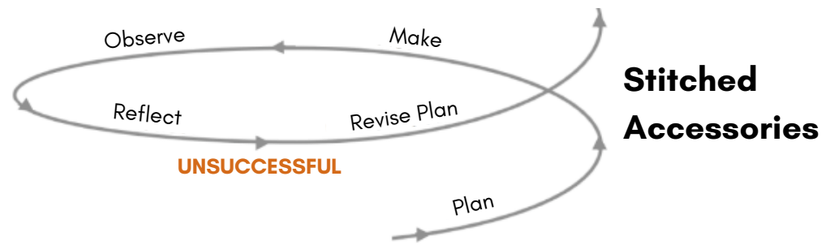


Figure 23. Cycle 1, (Graph, Alix Vital, 2025).

Cycle 2: Woven and Fastened Accessories

In the second phase of material exploration, I shifted away from constructing new textiles and instead focused solely on the functional properties of the snap fasteners to assemble the components. While still including the residual fabric, this approach emphasized direct fastening, engaging in a process that resembled both weaving and structural linking, using only the existing material. The absence of additional materials such as thread highlighted the potential for minimal-intervention making, where modularity was achieved through the simple addition or removal of plackets. This allowed for adaptable, reconfigurable designs that could evolve alongside bodily or stylistic changes over time.

Figure 24. Snapped Corset, (Alix Vital, 2024).

While conceptually promising, this method revealed structural limitations. The fixed arrangement and quantity of snaps on each placket constrained the range of possible configurations, often resulting in repetitive or predictable patterns, which began to feel creatively restrictive.

This cycle of experimentation also brought attention to the unintended prominence of the surrounding fabric. Though not initially central to the project, this residual textile—left attached for reasons of time and cost efficiencies in the industrial donation processes – began to dominate both the making process and the visual outcome. While recyclable, it diverted focus from the hardware itself, which had been the component I was originally most drawn to.

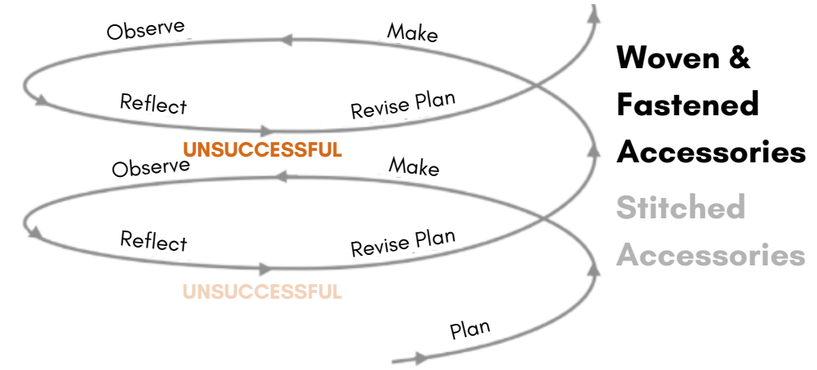


Figure25. Cycle 2, (Graph, Alix Vital, 2025).

Insights

As my material investigations progressed, I became increasingly drawn to working with hardware in isolation, rather than attached to fabric. This shift was driven by a desire to explore the tactile and structural qualities and constraints of metal components, which offered a different kind of aesthetic and conceptual potential —one that felt more enduring, raw, and materially honest. Hardware, particularly metallic fasteners, carried a sense of desirability due to their visual weight, mechanical function, and symbolic associations with durability and strength. Concluding these cycles, I chose to eliminate the textile component in future iterations, redirecting attention to the underexplored mechanical complexity of the hardware itself. This led me to the final direction of this project—exploring the expressive potential of jewellery. Overall, the evolving direction of this project—from raw hardware to wearable expression—reflects both the conceptual grounding provided by the Contextual Review and the adaptive, practice-led framework outlined in the Methodology.

Project Definition

The Design Proposal

Jewellery & Modularity

The decision to centre my practice-led research on jewellery design evolved through both material exploration and conceptual alignment with the themes of circularity, design activism[120] and post-consumer waste. I was also drawn to the expressive potential of jewellery.

My early design work had focused on corsetry and handbags, items that inherently explore the interplay between rigidity, three-dimensional form, and function. These early experiments sparked a growing interest in modularity, specifically through the functionality of snap fasteners, which signalled indefinite possibilities for customisation once they were removed from the limiting backing fabric. This orientation toward structured, durable forms with high creative potential led naturally towards jewellery, a discipline long recognised for its capacity to condense significance, symbolic meaning and material experimentation into small-scale, highly tactile objects.[121] The smaller scale of jewellery made it ideal for showcasing the traces and marks of past use, highlighting the afterlife of garments through patina, assemblage, and visible repair. Unlike larger fashion items, jewellery allows for intimate, concentrated storytelling through material composition, scale, and longevity.[122] It offered a site for precision and experimentation that aligned with the nature of the small, rigid metal components I was salvaging and reworking.

120 Fuad-Luke, A. (2009). Design activism: Beautiful strangeness for a sustainable world. Earthscan.

121 Tiffin, S. (2010). "Adornment and Identity: The Role of Jewelry in the Construction of Meaning." Journal of Material Culture, 15(3), 329-347.
Van der Meulen, S. (2016). "Adornment, Identity, and Belonging: Jewellery and the Personal Narrative." Journal of Visual Anthropology, 29(1), 83-101.
Hughes, M. (2018). "The Meaning of Jewelry: Emotional Connections and Symbolic Significance." International Journal of Sociology of Fashion, 15(2), 45-62.

122 Basilea Catherine, J., & Rajalingam, N. Why do people go for jewellery? An insight into consumers' motivation. Anand Bihari, 223.
Dodd, L. (2007). "Jewellery and the Body: Art, Metaphor, and Meaning." Journal of Contemporary Ethnography, 36(5), 597-617.
Patterson, S. (2009). "Preciousness and the Representation of Jewelry: How Material Objects Reflect Personal Significance." Cultural Anthropology Review, 30(4), 532-550.

Jewellery also lends itself to the craft-based and artisanal approaches gradually re-emerging within the broader fashion sector as discussed in the previous chapter.[123] This corresponds with my desire for more hands-on, materially engaged processes that prioritise slowness and intentionality. The uniqueness of hand-made over mass-produced jewellery can offer longevity through both product durability and emotional attachment. These qualities offer compelling ground for investigating the narrative and functional potential of post-consumer waste, especially in relation to overlooked rigid materials such as hardware and closures.

Aesthetic Analogy – Punk

My practice draws from the mindset of broader Critical Fashion Practices[124] movement and acknowledges particular inspiration from punk culture. My acknowledgment of the punk ethos in the context of this project is in the use of found or salvaged materials, in being visually impactful, and in having disruptive intent. I want my work to enable a way of wearing jewellery that disrupt people's perception of current recycling systems by showing the waste identity, to be seen and worn as a statement. More than being purely aesthetic, I want the work to send a visual message and to be questioned by those seeing it as part of the critical fashion context it lies in.[125] This is how I define and use the punk ethos in a contemporary practice, as a non-mainstream aesthetic, made to be openly discussed and subject to receiving mixed reactions - as a denunciative and communicative movement through its visuals. It begs to be intentional and reflected on in relation to the issues it raises, simply by the way it looks or is being worn.

123 Pippa Small, a renowned jewellery designer, has dedicated over 20 years to supporting traditional communities globally with sustainable and ethical practices.
Harriet Zoe Yin, "Sustainable Jewellery Practice: A Creative Approach to Communicate Sustainability," June 15, 2023, https://doi.org/10.32920/23503821.v1. J OCAD University, 2016.

124 Critical Fashion Project. (2017). What is critical fashion practice? https://www.criticalfashionproject.org/text/what-is-critical-fashion-practice/

125 Audience here: gallery public, photography/image public (potentially displayed on social media), but also potential owners/stakeholders and their own public (people noticing the artworks on owners), in an extended vision of the project.

Inviting Response – Public Exhibition

By transforming discarded hardware into wearable precious objects, I aim to reframe waste not as detritus, but as a material with narrative and functional potential. Furthermore, jewellery's capacity to move between personal and public spaces will allow the work to operate as both personal adornment and public provocation—supporting the aims of design activism embedded in this research.[126] This aligns with the methodology, where exhibition is framed as both a method of inquiry and a tool for public engagement. Thus, jewellery emerged not only as a practical outcome, but as a strategic medium for communicating the complexities of post-consumer waste and critical fashion practices.

In the context of this research project, I am creating modular jewellery pieces intended for public exhibition. These works aim to reveal the often-unseen complexities of apparel recycling by engaging audiences through their visual identity, exposed components, and the curated space in which they are presented. Exhibiting is a powerful observational and reflective method, offering an opportunity to organize a visual narrative, generate external feedback, and initiate dialogue. The setup of a final public display serves not only as a communication tool but also as an observational device—testing how viewers respond to the artworks and their presentation.

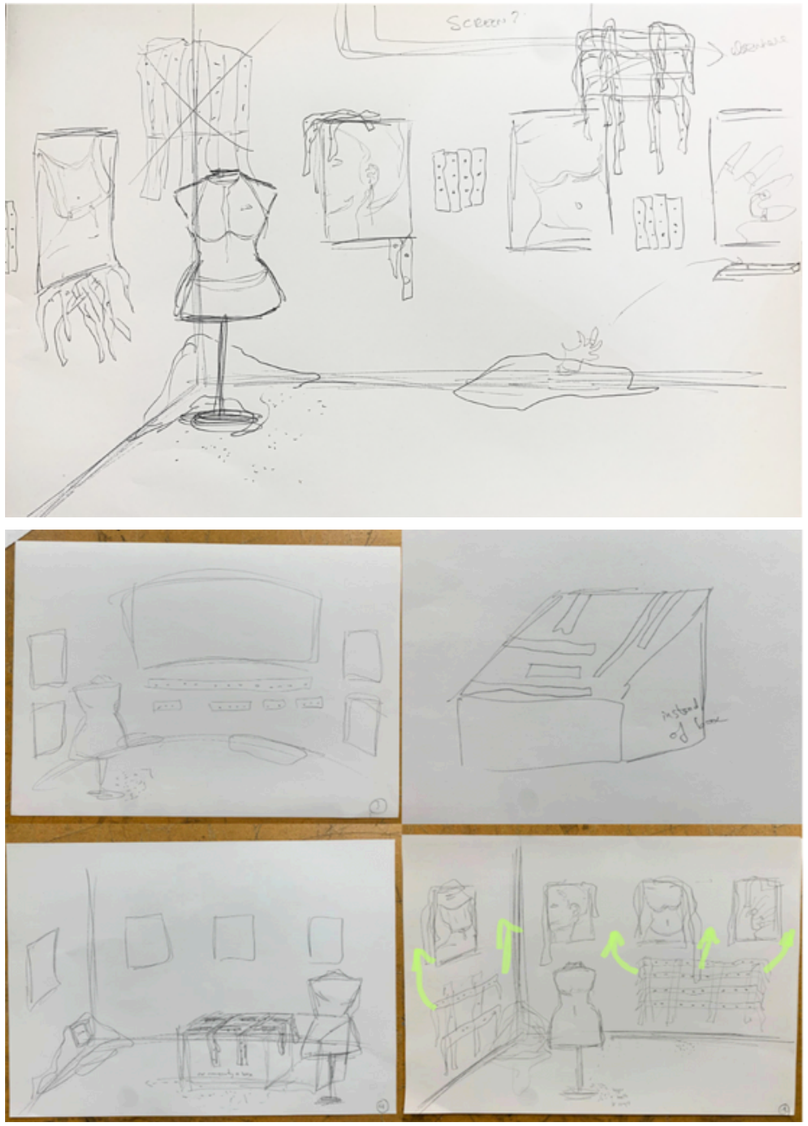
Careful curation of display elements, including the spatial arrangement of designed artifacts, photographic prints, and contextual props, invites interaction and supports the overall storytelling. This approach offers valuable insight into how the work is perceived beyond the studio, prompting awareness, sparking curiosity, and encouraging questioning around established systems of waste and reuse. Rooted in critical fashion practices, this project aligns with design activism principles, as Dunne and Raby suggest, requiring public engagement to challenge norms and stimulate discourse.[127] Fuad-Luke agrees, noting that such work must be publicly visible to catalyse dialogue and challenge dominant socio-material systems. [128]

126 Perry, P. (2013). "Jewelry and the Social Significance of Wealth and Status." Fashion Theory, 17(3), 211-232.

127 Dunne, Anthony, and Fiona Raby. 2013. Speculative Everything: Design, Fiction, and Social Dreaming. Cambridge, MA: MIT Press.

128 Fuad-Luke, Alastair. 2009. Design Activism: Beautiful Strangeness for a Sustainable World. London: Earthscan.

Without public exhibition, this work would remain a private creative exercise rather than an active intervention, making the exhibition a vital site for communication, reflection, and potentially inspiring more informed decision-making and future initiatives.[129]



Figures 26. Exhibition Display Unit Sketches, (Sketches & Photographs, Alix Vital, 2025).

129 Clarke, Alison J. 2011. Design Anthropology: Object Culture in the 21st Century. Vienna: Springer.

Limitations

Scope

While this project is grounded in modularity as a core design strategy—a concept widely recognised for extending product lifespans[130]—it does not achieve full circularity. As previously discussed, circularity involves a highly complex and systemic rethinking of design, production, and end-of-life processes.[131] Attaining a model of 100% circularity would require the complete elimination of waste, including secondary waste generated during the repurposing process itself. In this case, fabric remnants attached to the salvaged hardware are removed during fabrication, but due to their minimal volume and material inconsistency, they are not viable for further recycling.[132] More importantly, the volume of snap fastener and zipper waste from clothing recycling plants would likely outweigh opportunities for redeployment into jewellery, so only a portion of the waste stream could be reutilised in this manner.

Furthermore, although modularity allows for adaptability and prolongs usability in response to users' evolving preferences, it does not entirely prevent product disposal. True circularity would require the capacity for full disassembly and material recovery, enabling future transformation into new, desirable forms. While the materials selected for this project are robust and, to some extent, repairable, they are not immune to damage. Additionally, the current assembly methods do not ensure easy separation of different materials, which poses a barrier to effective recycling. As such, this project acknowledges a key limitation: it offers a contribution toward circular thinking but stops short of achieving fully closed-loop sustainability.

130 van den Berg, Maarten R., and Conny A. Bakker. 2015. "A Product Design Framework for a Circular Economy." Proceedings of the PLATE Conference.

131 Ellen MacArthur Foundation. 2013. Towards the Circular Economy: Economic and Business Rationale for an Accelerated Transition. Cowes: Ellen MacArthur Foundation.
Bocken, Nancy M. P., Ingrid de Pauw, Conny Bakker, and Bram van der Grinten. 2016. "Product Design and Business Model Strategies for a Circular Economy." Journal of Industrial and Production Engineering 33 (5): 308–320. https://doi.org/10.1080/21681015.2016.1172124.

132 I could theoretically send this textile back to ImpacTex achieving a zero-waste scenario, however, this is very unlikely to happen in commercial recycling practices and is only made possible in this practice-led research through the labour-intensive metal and fabric separation.

Materiality

Working with materials intended for bodily adornment—specifically jewellery—introduced important considerations around health and safety. Any element in direct contact with the skin, especially in intradermal applications such as earrings, needed to be composed of sterile, virgin material. This led to hybrid constructions, combining new, medical-grade components with salvaged metallic elements to balance ethical reuse with user safety.

Final Research Question

Discoveries around the complexities within material systems, reflections on design activism, and explorations with materiality, dimensionality and modularity, have all led to the final direction of my project, summarised in my final research question:

How can modular jewellery design, using repurposed post-recovery hardware waste from workwear, be employed as a critical fashion practice to reveal the unseen complexities of apparel recycling?

Documentation of Process

Metal Jewellery

This marked the beginning of my third and final product direction—eliminating fabric entirely and working exclusively with metallic components in an exploration of jewellery, a medium I had been drawn to from the outset.

Cycle 3: Modular Earrings

I used the inherent modularity potential of snap fasteners to develop interchangeable elements, conceptualised as a principle of bases (‘shells’) and decorative modules (‘charms’).[133] I initiated this exploration with earrings, attaching the male component of a snap to sterile earring pins to comply with health and safety standards.

Figures 27. Metal Fabric Separation Process, (Alix Vital, 2025).

133 Working on this principle of shells and charms, the former would serve as a functional base, attached to the earlobe, while the latter would be more aesthetic and interchangeable on the bases.

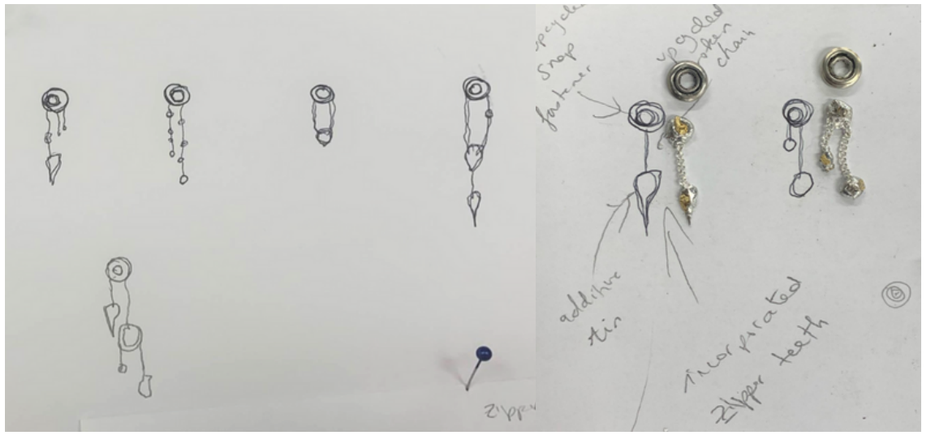



Figures 28. Snap Fastener Embedded Earrings , (Alix Vital, 2025).

Once the intricate and time-consuming process of metal/fabric separation was completed, I was able to focus on the aesthetic and material possibilities of the charms. The creative process combined sketching with intuitive, material-led experimentation, incorporating found elements such as second-hand chains to enrich texture and narrative.

Because showing the identity and provenance of my resources is a key aspect the communication aspect of my project, I also elected to incorporated the zipper teeth (sourced from donated ImpacTex zippers) as these provided interesting patterns and details. To combine and connect pieces together, I used a soldering process requiring using additive tin matter.[134]

While the earrings created in Cycle 3 were aesthetically pleasing and provided a strong, valuable contribution towards answering my research question, I felt that I could still take the project further through exploring a broader variety of more complex body adornment pieces.



Figures 29. First Designs Sketches & Prototypes , (Alix Vital, 2025).

134 While this was introducing new material, like the sterile earring pins, this was a considered decision, and a necessary requirement.

Figures 30. First Results, (Alix Vital, 2025).

Cycle 4: Modular Jewellery

Cycles 3 and 4 occurred in close succession and the outcomes were complementary in nature, marking a progression from using pre-made bases for earrings only, to creating more complex, handmade bases out of a variety of salvaged componentry, designed to be worn on different parts of the body. This process required approximately a month of experimentation. While both cycles follow the same foundational approach, expanding the variety of bases also broadened the possibilities for charms. Notably, components developed in Cycle 3 continue to be compatible with those from Cycle 4 and will be included in the final prototype collection.

The following sections document the process undertaken for both cycles.

Design Process

Planning

During the ideation phase, zippers emerged as another key metallic resource available in my waste collection from which to make bases. Drawing inspiration from their inherent flexibility, I decided to explore the potential of using the zippers in their entirety rather than dismantling them to isolate the individual teeth. The length and texture of the zippers introduced new possibilities, with potential for being constructed into necklaces, rings, headbands, torso ornaments, and bracelets. Prior to development, I conducted tactile assessments to ensure the material's suitability for direct contact with skin, considering both comfort and safety. As with previous design phases, the planning stage of the process began with preliminary sketches to visualize and refine my concepts.

Having already explored modularity, my focus now shifted toward investigating connectivity. Here, I began experimenting with the idea of using charms not only as decorative features but also as functional connectors between bases, thereby enabling new configurations and combinations within the modular jewellery set.

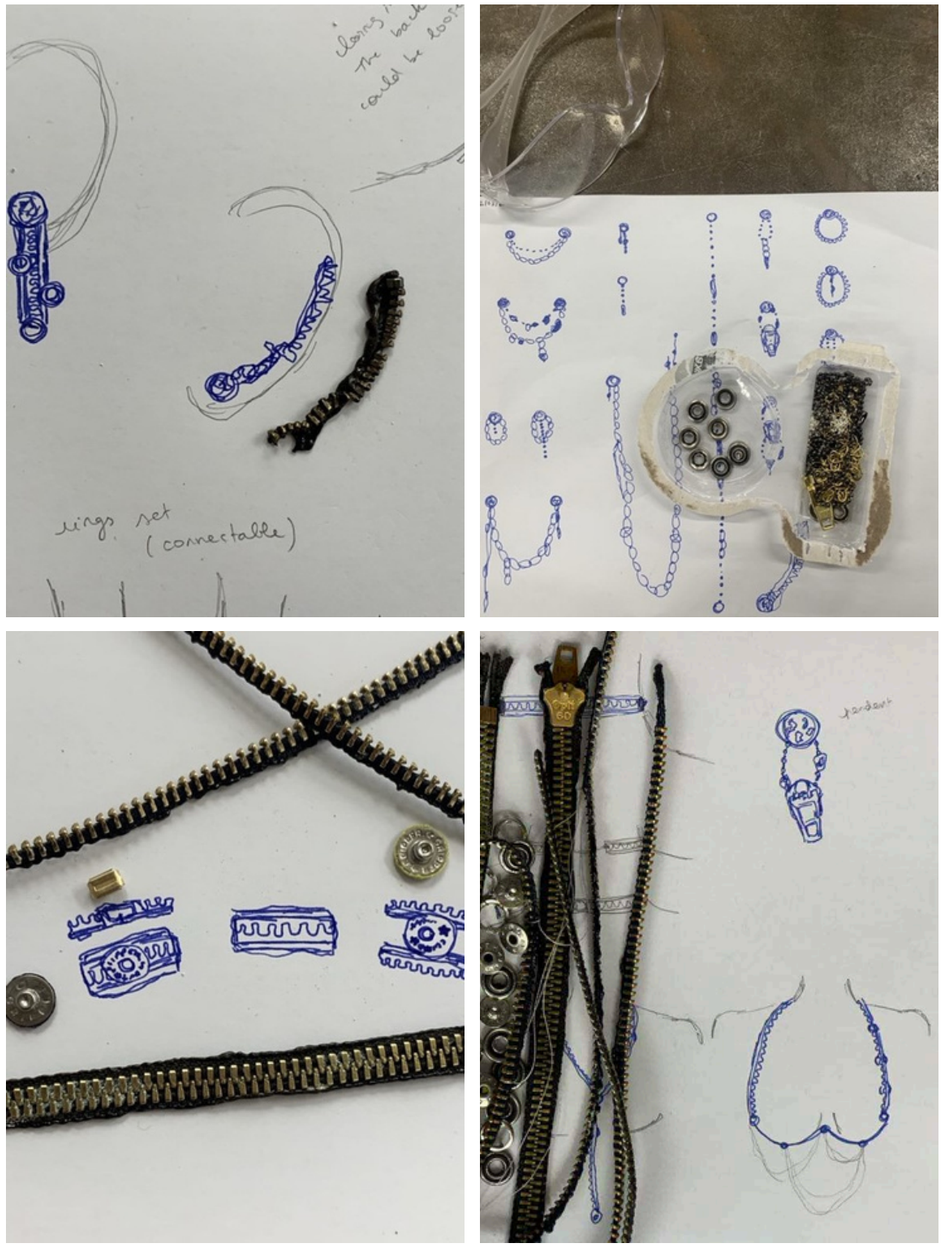


Figure 31. Bases & Connecting Charms Sketches, (Alix Vital, 2025).

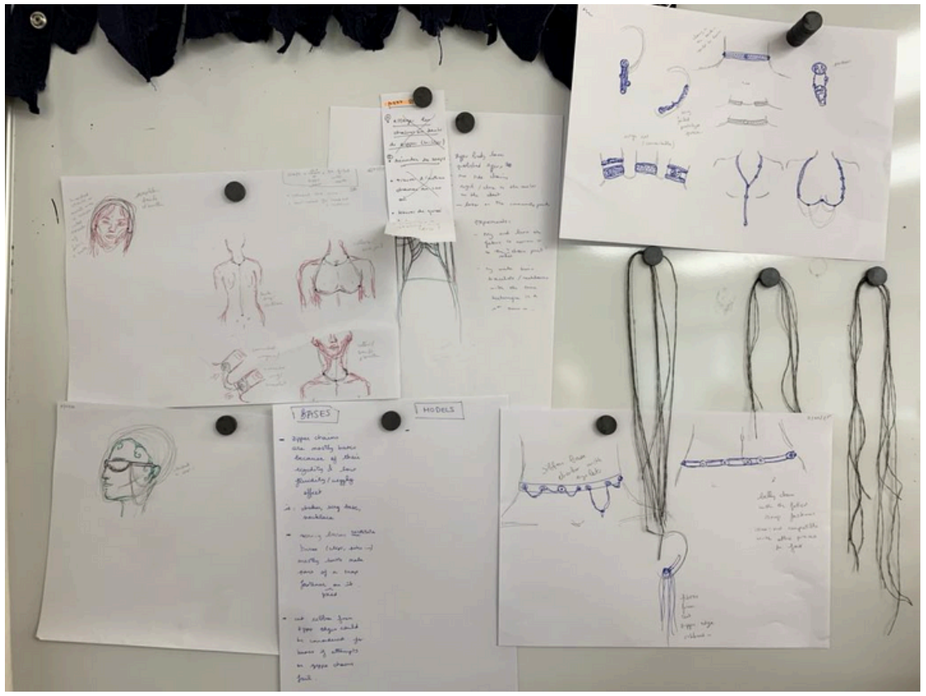


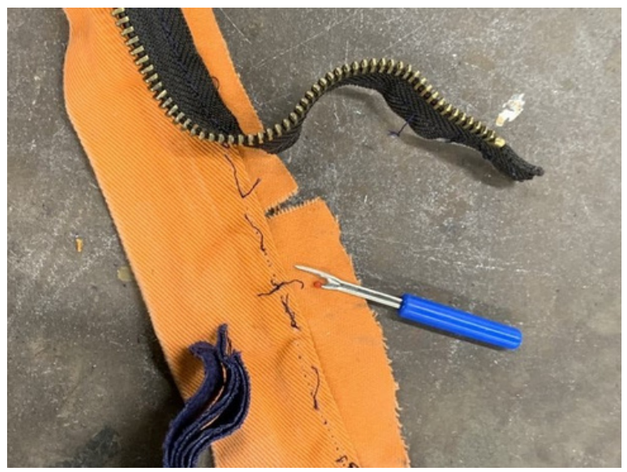
Figure 32. Studio Wall, (Alix Vital, 2025).

Making

As detailed in the Methodology section on practice-led approaches and reflection-in-action, making is a critical part of this research, with challenges not unexpected.

BASES & CHARMS

The new zipper explorations ran concurrently with further snap fastener trials, as these remained an essential component for the modularity function, which would also feature within the zipper-based pieces. Zippers were relatively easily unpicked from the residual garment fabric. The separation of the metal snap fasteners from the cloth plackets was a much more labour-intensive process, involving the use of a seam ripper, scissors, and tweezers to carefully prise the hardware from the fabric. As I repeated these procedures, I developed a deeper understanding of the structural weak points within the materials, which gradually increased the ease and efficiency of extraction.



Figures 33. Hardware Extraction Process, (Alix Vital, 2025).

BASES

To enhance the suitability of zippers for use as structural bases—referred to here as ‘zipper chains’—I sought to increase the metal-to-fabric ratio by removing excess textile (zipper tape) without compromising the integrity of the chains. Initial experimentation involved burning the surrounding fabric while attempting to control it using magnets; however, this method proved ineffective, as the synthetic fabric hardened after melting, reducing the desired flexibility. The most effective approach involved cutting the tape close to the teeth, and then carefully sealing the edge with a small flame (e.g., a lighter), which preserved both structure and pliability. This process resulted in zipper chains that proved highly effective as base elements.

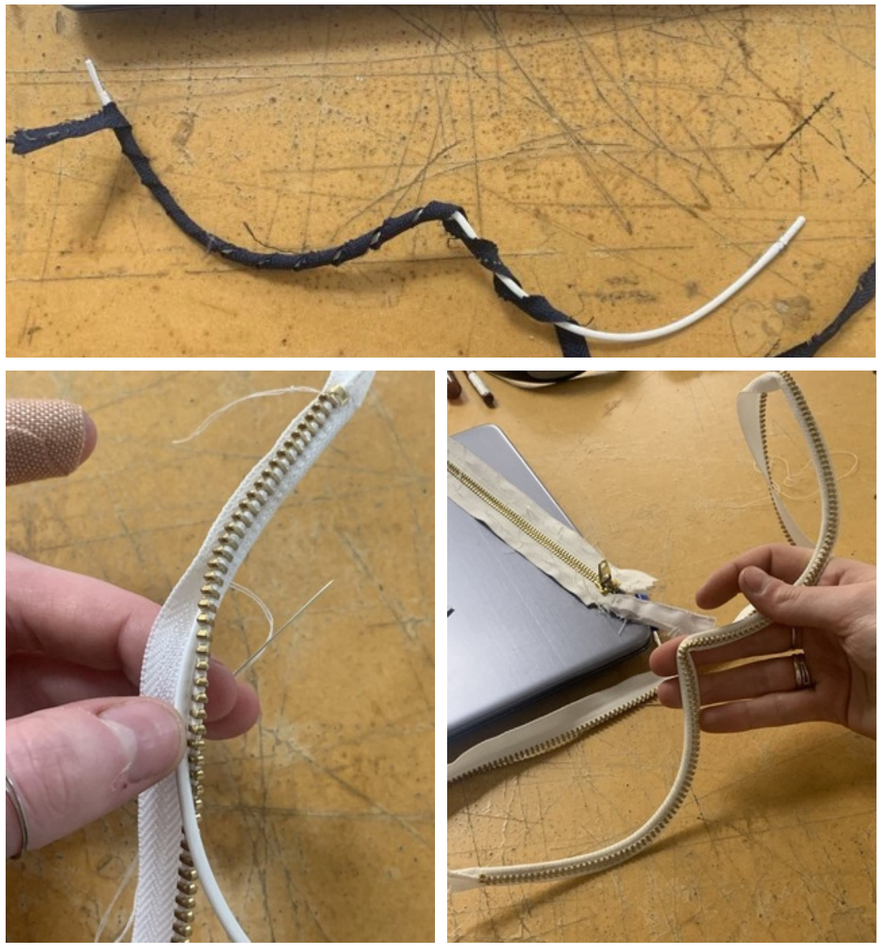
Figures 34. Zipper Chains & Hands after Polishing Process, (Alix Vital, 2025).

Figures 35. Cutting & Melting Zipper Edges, (Alix Vital, 2025).

To integrate the male components of snap fasteners onto the zipper chains—intended as connectors for interchangeable charms—I initially followed a technician's advice to resin-glue and press the fasteners into place on top of the zipper teeth surface. However, this method failed to withstand the mechanical stress caused by repeated snapping and unsnapping, even after full curing of the resin-glue. A more effective solution was found, utilizing the snap fasteners as connectors (but also retaining the modularity potential) . To do this, I removed selected zipper teeth to make space for the snaps, and used the snap fasteners' embedding mechanism to securely clamp the two parts of the male snap directly onto the zipper chain.

Figures 36. Glue Failure & Process Reconsideration, (Alix Vital, 2025).

For a specific torso ornament, I repurposed an underwire salvaged from an old swimsuit, which I had deliberately set aside for potential reuse. Initially, I experimented with wrapping zipper ribbon scraps around the wire, but securing them would have required adhesive, which by then, I wanted to avoid. Ultimately, I developed a more refined method by delicately sewing a halved zipper around the wire, allowing the metal teeth to remain visible. This technique was subsequently applied across a series of body ornaments (without underwire), offering both aesthetic value and structural integrity.



Figures 37. Bra Ornament Exploration, (Alix Vital, 2025).

By the end of this prototyping phase, I had developed a range of zipper-chain bases, including necklaces, earrings, brooches, rings, bracelets, headbands, belly chains and torso ornaments.

Figures 38. Range of Deployed Body Ornaments, (Alix Vital, 2025).

CHARMS

For the creation of charms, I applied the same assembly methods developed in Cycle 3. This involved combining various elements—such as the female parts of snap fasteners, metal hardware sourced from workwear (including individually collected zipper teeth, eyelets, and larger components like sliders), as well as second-hand chains acquired through thrifting. Design decisions were guided alternately by preliminary sketches and spontaneous creative intuition. Again, the fabrication process was painstaking, due to the composition, scale and intricacy of the components. Components had to be held in place using small clips and pliers, tin additive was required for soldering, and the soldered material had to cool and solidify correctly within the snap mechanism to provide a secure hold without impairing the functionality of the fastening system.

Early trials lacked precision, however, given the punk DIY ethos, some level of imperfection was deemed acceptable.

Figures 39. Charms Prototyping, (Alix Vital, 2025).

Figures 40. Gathering of Second Hand Chains, (Alix Vital, 2025).

Observing

Visual Outcomes

During the observation phase, I noted strong similarity between my initial sketches and the final prototype outcomes for both my bases and charms, which was both affirming and encouraging. The results were not only consistent with my expectations but were also enriched by serendipitous decisions that emerged during the making process. The visual of the pieces showed the desired narrative by exposing the identity of the resources and evoking their provenance.

I was particularly pleased with the interplay of contrasting metal tones and textures, which created a visually compelling balance across the designs. This sense of balance extended beyond the individual charms to the relationships formed between bases and charms. The combination of light and heavy elements, nuanced colour contrasts, and intricate detailing contributed to what I consider a refined yet industrial aesthetic—one that stands out against various skin tones. I also valued the modularity and dynamic connectivity that defined the structure and function of the pieces.

Figures 41. Visual Documentation of Fresh Prototypes, (Alix Vital, 2025).

Wearing & Interaction

As the work developed into wearable artefacts, self-styling and real-life application became an informal yet valuable observational method. Testing pieces on the body helped evaluate comfort, assembly logic, and aesthetics in context.[135] Wearing the work allowed me to intuitively assess how components interacted when in motion or layered—especially with the introduction of connections as shown in Figure 42, turning user experience into a design feedback loop. Observing the pieces worn on the body further validated their aesthetic and functional success.[136]

Figures 42. Prototypes Try-On & Interaction, (Alix Vital, 2025).

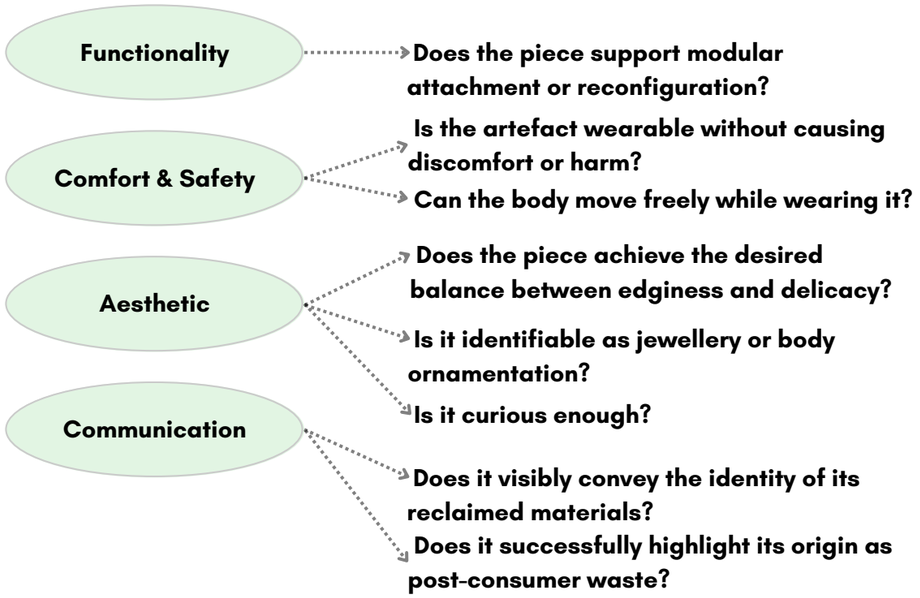
135 Appendix : Self Analysis of Ornaments Assembly Logic and Styling: an informal guide.

136 For instance, one elongated earpiece effectively framed and drew attention to the jawline.

Reflecting

Evaluation

To systematically assess each prototype and identify both successes and areas for refinement, I developed a set of evaluation criteria grounded in the core objectives of the project. These criteria guided the reflection phase of my process, allowing for a critical review of material choices, construction methods, aesthetics, functionality, and alignment with the project's conceptual aims.



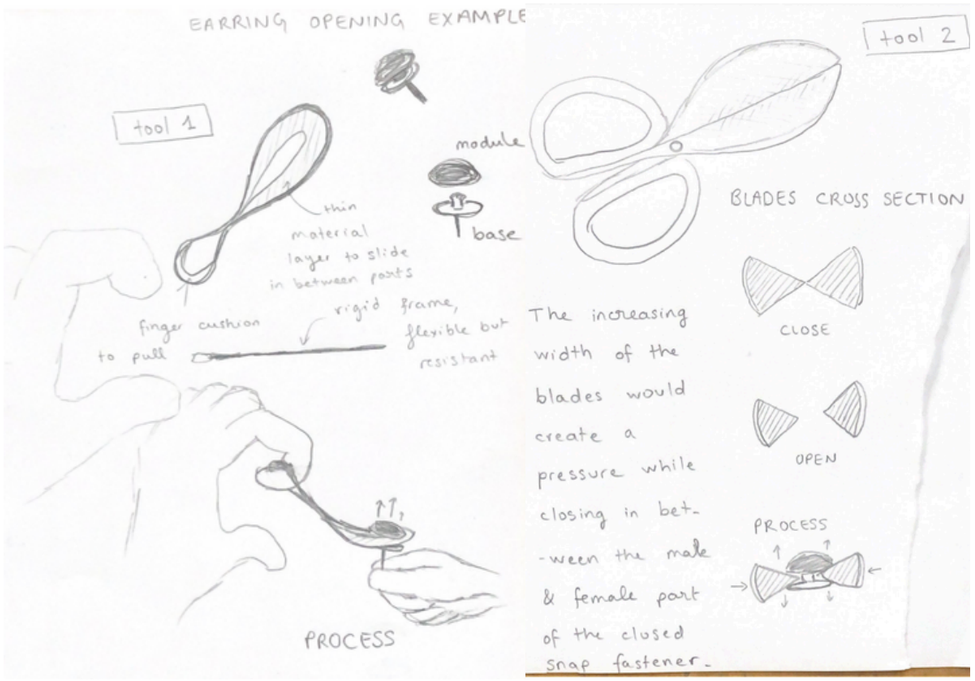
Figures 43. Developped Evaluation Criteria, (Alix Vital, 2025).

Materials

As part of this reflective inquiry, I also began reconsidering sourcing and production strategies. For instance, rather than relying solely on second-hand chains from thrift shops, future collaborations could involve manufacturers who sort and discard defective pieces, or systems that collect and repurpose non-precious metal jewellery considered 'worthless' by conventional standards. An additional opportunity lies in engaging customers by incorporating their broken or unused jewellery into bespoke commissions. Furthermore, I am exploring alternative joining techniques—such as using conductivity-based methods or melting down collected metals—as potential substitutes for traditional additive soldering and welding processes.

Mechanical Functionality

During the manipulation of my prototypes, I encountered a difficulty related to the use of snap fasteners—a central component of my modular system. While snap fasteners are designed for ease of use in garments, this functionality typically relies on the flexibility of fabric supports, which enable the user to generate the necessary tension to release the mechanism. In contrast, when these fasteners are mounted on rigid, isolated metal components—as in my designs—detaching them becomes more challenging. The process often requires inserting a fingernail or thin object between the two parts to separate them. This difficulty highlighted the need for a dedicated tool to facilitate regular use and improve accessibility. Figure 44 shows sketches of the types of devices—small clip or miniature 'crowbar'—that might assist in the separation of modular elements.



Figures 44. Sketches of Potential Tools to Solve the Mechanical Matter, (Alix Vital, 2025).

Findings

Reflections

The reflection process highlighted both the achievements and limitations of using waste-led modular jewellery design as a critical fashion practice. Repurposing hardware waste from workwear—such as zippers and snap fasteners—allowed me to utilise the technicality of the materials and preserve their visible identity, subtly revealing their provenance and inviting reflection on the often-invisible layers of apparel recycling. Modularity was successfully integrated into all prototypes, enabling flexibility, user interaction, and prolonged use, which together support more sustainable consumption practices. This reflection confirmed the importance of adaptability—not only within the objects themselves but also within the design process—highlighting that critical and sustainable design is as much about responsiveness and openness as it is about materials and form.

Through this artisanal approach, I also encountered limitations and challenges, particularly around ergonomics, technical issues, and structural constraints. These mirror the complexities of real-world recycling systems, which are frequently incomplete, labour-intensive, and unevenly distributed. These tensions became part of the narrative, reinforcing the project's intention to expose, rather than resolve, systemic issues with current apparel recycling practices. The exhibition period will play a key role in framing the work, enhancing its communicative potential through storytelling and display.

What began as a material interest in waste evolved into the recognition that waste is part of a broader system—shaped by resource flows, policies, mindsets, and deeply held assumptions about value and disposability. Addressing it meaningfully requires engaging not just with materials, but with the systemic conditions that allow ongoing waste generation and problematic disposal practices.

Insights Drawn

Engaging with the unseen complexities in apparel recycling systems, requires a focused approach and considered communication. In an environment saturated with sustainability discourse—and often diluted by greenwashing—fostering awareness or even curiosity about overlooked issues requires both visual and conceptual nuance. (Contextual Review on greenwashing and consumer perception). These pieces serve as active carriers of meaning, with materiality, modularity, and form collectively shaping a narrative of transformation and the challenges of circularity. Rather than relying on didactic messaging, the project engages the audience through tactile and aesthetic qualities of the pieces. Modularity becomes not only a technical device but also a symbolic one—offering adaptability, longevity, and a critique of overconsumption. (in line with circularity principles in Methodology). The exhibition format further supported this by providing a context where objects communicate both their purpose and the systemic conditions that prompted the work.

Review of Exhibition

The work presented in the exhibition consisted of a series of modular jewellery pieces—mainly charms but also some bases—hanging using their original functional properties. The pieces were suspended vertically from the gallery wall clipped to male parts of snap fasteners, creating a visual tension between their weight and gravity, while drawing attention to their mechanical articulation and material origin. Positioned vertically within the display was a 65-inch screen that looped a series of short video segments. These videos, developed through a directed shoot, demonstrated the adaptability and interactivity of the modular system: pieces were shown being connected and disconnected on models, highlighting the modular mechanics and the embodied wearability of the pieces. This video display was also meant to create movement and bring attention to the space.

This installation was conceived not only as a material showcase but as a critical site of communication, in line with the research objective to interrogate and expose the often invisible complexities of apparel recycling systems—particularly the systemic failure to reclaim small-scale hardware waste. The work engages modular jewellery design as a form of critical fashion practice, encouraging reflection on value, transformation, and reuse through a wearable medium. The spatial strategy positioned the jewellery pieces around the screen in a loosely scattered, cloud-like arrangement, inviting the audience to move in closely and inspect the individual components, which, while small in scale, carried the conceptual weight of industrial waste transformed into intimate artefact.

The audience's engagement was integral to the operation of the work. While the pieces themselves remained static, the looping video performance provided a sense of motion and transformation, underscoring the designed potential for physical interaction and reinterpretation. The visual language of the video—a hybrid of backstage documentation and stylised demonstration—served as both instruction and critique, positioning the jewellery not just as adornment but as communicative device. By staging the exhibition as both an aesthetic encounter and a discursive space, the installation invited viewers to consider their own proximity to issues of labour, waste, and sustainability, encouraging awareness and dialogue around material systems often overlooked in mainstream fashion discourse.[137]

137 Appendix : MDes Exhibition - practice display

Discussion

While the initial idea for the project was an idealistic vision of establishing systemic collaboration between companies and designers – where various hard-to-recycle industrial waste would be redistributed for creative responses on a case-by-case basis, in practice it took the form of a more focused, practice-oriented initiative. While the broader systemic model remains ambitious, this project marks an initial step, with potential for sharing through exhibitions, strategic design competitions and sustainability-focused events. These platforms might offer opportunities for further development of the work, as informed by the contexts and networks encountered.

As noted in the Limitations section of the Project Definition chapter, this work does not achieve circularity of materials within a closed loop system. However, the work has laid the foundation for ongoing research on upcycling as both a method and a message. Future directions could include expanding this jewellery system, exploring new material flows, or applying similar principles to the design and manufacture of different types of artefact. The goal remains the same—to use waste-based making as a critical form of communication.

Outside the scope of this thesis, the jewellery could be made commercial available, along the lines of the jewellery sold by Article 22. This would require a focused marketing strategy, with a clever brand identity and thoughtful narrative to allow the pieces to function as tools to raise awareness. In doing so, the jewellery would be able to operate on both personal and collective levels, integrating critique about consumption patterns and waste management into everyday use, expanding the communicative scope of the project beyond exhibition contexts.

Conclusion

This project focuses specifically on post-consumer clothing waste, specifically, post-recovery hardware sourced through a collaboration with a local apparel recycling company, ImpacTex. These ‘waste-from-waste’ materials represent a nuanced layer of apparel recycling that remains largely unseen and unaddressed.

The recovered hardware elements, metal snap fasteners and zippers from workwear —typically considered non-recyclable due to their composite structure and attachment methods—posed a compelling material challenge. Drawn to their rigidity and structural potential, I embraced these components as a primary material. My background in accessory design—initially explored through handbags and corsetry—fostered an appreciation for rigid media, its constraints and its capacity to define form in three dimensions. Transitioning into jewellery design allowed for deeper exploration of modularity, material agency, and critical storytelling through waste.

Through iterative Action Research and Reflective Practice processes, a modular system of body adornment bases and interchangeable charms was developed. The choice of jewellery as a medium for this practice-led research comes from both personal attraction for this type of body adornment and the social significance that jewellery traditionally holds, connecting closely to the wearer in both the physical and emotional sense. The outcomes—wearable, modular, and materially communicative—successfully combine aesthetic appeal with embedded critique. They invite users and viewers to engage with waste not as something to hide and dispose of, but as something to reconsider and value. The exhibition format served to further amplify this message, enabling storytelling through contextual framing.

The modularity of the jewellery also encourages reduced consumption by allowing customisable wearing experiences with multiple configurations. This also fosters emotional longevity, as adaptable objects are more likely to evolve with the wearer and be retained over time.

After the identification of a gap in the apparel waste management processes, this research has explored how modular jewellery design, using repurposed post-recovery metal hardware waste from workwear, can function as a critical fashion practice to reveal and raise awareness of the unseen complexities of apparel recycling. By preserving visual identity, and embedding material provenance and adaptability into the design of jewellery and body adornment pieces, the research seeks to challenge linear consumption patterns and make visible the residual, often-overlooked aspects of apparel waste.

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Appendices

Self Analysis of Ornaments Assembly Logic and Styling - an informal guide

Extracted from a 15 pages presentation document, this appendix tries to explain my tacit logic while assembling jewellery. This internal reflection informs my thinking process and personal experience with wearing and interacting with body ornaments.

7- Colour, texture & shape

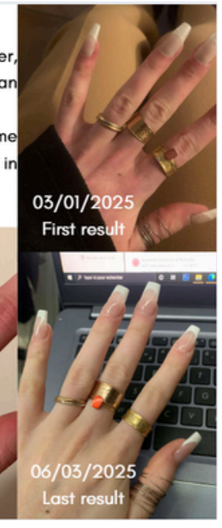
My base being harmonious enough in its tone, one other way to make a piece strong would be by playing with colour touches. For this, I had to determine my colours, again in a sense of it being an extension to my body. It has to be a colour you love/that speaks for you, and that also potentially suits your skin tone.
I love green but not all greens compliment mine, see below.
Brightness tends to fade with time and use but it is also something to consider, along with texture. Those would make a piece strong.
Last but not least, shape. A particular shape can catch attention on your hand. It can also elongate your hand, make it look 'heavy' or create a unbalance so it is, in my opinion, ery crucial so try and have a critical glance.
Sometimes, the same ring worn upside down would give a completely different look to your hand.

9- Balance & sizes

The size of the jewels play a significant role in the balance. You can choose a delicate combination only mixing thin elements, or a maximaliste one combining only big pieces. I personally love to blend everything together. It really is all about balance. For me, combining jewellery on a body is a critical and long process. It requires visual and haptic feedbacks. If I spend too much time on this reflection, I might stop for some time and come back to it with a fresh mind and vision. It has to feel right when you look at it, and it might exists coded and visual laws for this, as I am trying to explain, but it is overall very subjective and personal. The process can take a minute if it looks obvious, or months/years and evolve every new piece arrival or change of mind. The only criteria that is over-passing balance is personal satisfaction. Because of the meaning I give to jewellery, it can be unbalanced, if your are feeling aligned with your ornaments and it feels right to you, that is a very personal journey. Also, as stated previsouly, it has to be comfortable, unlike the first three top configurations.

11- Stacking

When stacking rings, especially strong pieces, the finger on the hand will look heavier, the order also have to be thoroughly considered. I mentioned previsouly, the stack can have a retaining role, or not.
When I got offered this (somptuous) ring a few months ago, I spent a lot of time wondering which finger it would embrace the most, but the matrix to solve was also in which order. It was a real puzzle with the other players/rings here.
The configuration I ended up choosing was in fact later reconsidered and changed.



12bis- Project context

I applied the same principle and thinking process while making my project practice. Trying it on in real-life (on my hands) to get concrete visual and haptic feedbacks. It unconsciously guides my practice and helps me determine if a piece work or not, is strong or not.

MDes Exhibition - practice display

11-14 June 2025
Te Wai Ngutu Kaka Gallery 2
40 St Paul Street, Auckland CBD, NZ

Screen dimension: 65-inch TV playing video shoot in a loop
Total loop duration: 8min 24
Photograph/videograph: Jina Shin
Models: Shony K. Devassy, Annie Kim, Léa Badarelli Daloia
Video link:
https://drive.google.com/file/d/1-4GP4ZKZmNT5iKP8b_a0M6cqVh2FgFuI/view?usp=sharing

Media/materials:
Salvaged post-recovery workwear plaquettes
Jewellery pieces made out of hardware from post recovery workwear (snap fasteners, zippers)
Second hand and salvaged chains
Additive soldering tin