

CO-CREATING SUSTAINABLE FASHION

A PARTICIPATORY APPROACH FOR INVOLVING USERS IN THE DESIGN PROCESS

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Abstract

The fashion industry is dominated by the mass-market sector, characterised by extremely short production times, low manufacturing costs and high volumes of garments driven by short-lived trends. In this process, the profits are prioritised over users' needs, while the negative effects of overproduction are overlooked. Despite raising awareness of fashion production's detrimental consequences, the design process often remains a mystery and there has been little research on including co-design approaches into it. Can involving users in the design process contribute to a behaviour change towards more sustainable fashion consumption? This paper adopts a research-through-design approach to bridge the gap between co-design and fashion. Drawing from design for behaviour change, we strive to redefine the concept of prosperity from a profit- and trend-motivated to focusing on the needs of the users through inviting them to participate in the design process. We propose a five-step framework for a collaboration between fashion professionals and users. The framework elements - brand research, understanding the user, defining function, building identity, and user test - facilitate an exchange of perspectives and encourage participants to become researchers of their relationship with clothing. The findings of this research invite designers and researchers to further explore this emerging field.

Keywords: *Fashion design, Co-design, Participatory methods, Sustainability, Design for behaviour change*

INTRODUCTION

Can involving users and their needs in the design process contribute to a change in behaviour towards more sustainable fashion? The fashion industry prioritises short-lived trends and profits over the needs of the users, and the link between fashion and consumerism is tight.

Fashion has an impact on both environmental and social systems. In this context, sustainability presents numerous challenges for the fashion industry, many of which threaten the sector's roots and structures (Fletcher, 2016). Markard and colleagues (2012 cited in Maier and Cash, 2020, p. 21) claim that: 'Sustainability transitions refer to long-term, multi-dimensional and fundamental transformation processes through which

established sociotechnical systems shift to more sustainable modes of production and consumption.' Therefore, the issue of sustainability in fashion cannot be solved with a single intervention, and rather than focusing on product-level improvements, the focus should shift to systemic innovation (Clune and Lockton, 2017). Rather than developing and evaluating individual interventions, understanding the value of those interventions in relation to the overall system is required (Maier and Cash, 2020). Similarly, as prosperity thinking involves a shared, inclusive view of prosperity and a focus on a planet-centred growth (Vignoli et al., 2021), it suggests a systemic, multidimensional shift of perspectives and behaviours.

In order to contribute to the changing of systems, the most desirable approaches focus on solutions that impact consumption rather than improving recycling and waste management methods (Clune and Lockton, 2017). To remain relevant and develop long-term sustainable solutions that anticipate future needs, companies must enhance collaboration among stakeholders and integrate creativity into their design processes (Monestier et al., 2024). Cramer (2011) suggests that implementing elements of participatory design can lead to the implementation of more sustainable behaviours among fashion customers. As more engaged users, with the power to choose garments that better meet their needs, they can start taking more conscious, motivated decisions, therefore changing their consumption behaviours and contributing to the change in the industry (Cramer, 2011).

This paper explores the implementation of co-design approaches into the fashion design process and their potential to influence sustainable consumer behaviours. We propose a participatory framework for collaboration between fashion industry professionals and users, exploring its role in shifting consumption habits towards sustainability.

THE MEANING OF FASHION IN SOCIETY

Fashion can be understood as clothing, the material covering the human body, but its significance goes beyond that, allowing people to express their personality, status, cultural associations, and political statements. Dressing style is seen as a language that allows others to connect and relate (Chon, 2014). According to Fletcher (2016), all users are fashion practitioners because the act of wearing garments qualifies one as a fashion practitioner. Fashion objects have meanings assigned to them by designers, and users consume those meanings through the consumption of clothing (Chon, 2014). Clothing that is worn and kept frequently adds value to the process of constructing identity (Connor-Crabb and Rigby, 2019). As the users' identity, values, and self-perception evolve over time, so does their fashion sense. Rather than being motivated by visible technological changes in the development of new products, purchasing new clothing is seen as a way of refreshing identity. New trends emerge as a result of users' desire to reinterpret clothing, giving them the freedom to develop a personal style that reflects

their identity (Fletcher, 2016). As a person's identity evolves, so does their clothing.

MASS MARKET FASHION AND CONSUMERISM

The perception of fashion is linked to cycles of change: invention, acceptance, and discard (Fletcher, 2016), and the availability of fast, mass-produced clothing has only increased individualised consumption of fashion, driven by fast-lived trends (Munasinghe et al., 2021). Moving production to low-labour-cost countries allowed producers to lower prices, letting users to buy more. It also caused the *quality fade* (Connor-Crabb and Rigby, 2019). Because the quality has decreased, clothing degrades faster, forcing people to buy it more frequently. Today's fashion is linked to economic growth due to excessive production and consumption, and retailers compete in newness (Fletcher, 2016).

The mass-market segment of the fashion industry is the largest, offering large quantities of clothing at low prices. It is profit-driven and fiercely competitive (Munasinghe et al., 2021). Due to time constraints, designers rarely have the opportunity to fully explore and develop completely new concepts, which has a negative impact on creative innovation within the design process. Instead, they look for inspiration in current fashion trends, and clothing is mass-produced by replicating others' work but using lower-quality materials.

Munasinghe et al. (2021) identify five major steps in the mass-market fashion design process: trend research, trend pack development, design development, prototype development, range finalisation, and approval. The process is being worked on by multiple teams at various levels, including design teams, creative directors, technologists, buying and merchandising teams, and management teams. Significant decisions are frequently made based on profit rather than design potential, limiting the role and innovation of designers.

RESEARCH GAP: CO-DESIGN APPROACHES IN FASHION

Before the mass-production of garments was introduced on a large scale, dressmaking and tailoring were highly participatory, engaging the customers in the process of making garments (Cramer, 2011). Collaborative-participatory design entails designing with the user as an active contributor to each step of the design development process

and co-creator of the project with the designer. Instead of simply benefiting from the project, the user becomes an expert in their experience and plays an important role in extending knowledge, generating ideas, and concept development (Scariot et al., 2012).

The co-creative approach is based on collective creativity, which allows for more insights and connections due to the collaboration of participants with different ways of thinking. Team diversity has the potential to boost creativity (Sanders and Stappers, 2012). The emphasis of design work shifts towards seeing creativity and innovation through multiple perspectives; however, designers' roles are still considered necessary due to their highly developed skills (Scariot et al., 2012).

Ericson and colleagues (2016, p. 972) mention that 'it is not straightforward to involve common people in the creative stages of idea generation and concept development.' Appropriate approaches have to be adopted in order to allow for exchange of ideas and thoughts within the teams. Because of their different backgrounds, both users and designers have different ways of approaching the issue, with the users often more responding to everyday aspects, and designers being interested in the tangible aspects (Lee et al., 2006).

According to the user-centred approach, the greater the user involvement and the more insights can be gathered, the better the product design will be, as it will be suitable for its purpose (Scariot et al., 2012). Allowing the user to participate in the design process lets them invest something of themselves in it, establishing a bond between the user and the product that is likely to result in keeping it for a longer period of time (Cramer, 2011).

The limited innovation in the fashion design process, as well as the negative impact on consumerism, provide an opportunity to investigate collaborative-participatory approaches to shifting customer behaviour in a more sustainable direction. However, little research has been done on co-design specifically in fashion, leaving a gap for investigating how it can be integrated into the design process, and what effect it would have on users' habits.

To address these gaps, this paper will address the following research questions: How can participatory approaches be implemented into the fashion design process, in order to centre the industry around the real needs of the users?

How can the implementation of participatory approach into the fashion design process lead towards developing sustainable behaviours?

FRAMEWORK FOR THE IMPLEMENTATION OF PARTICIPATORY APPROACH INTO FASHION DESIGN PROCESS

In order to facilitate introducing a participatory approach to the fashion design process, we propose a five-step framework (Fig. 01). The framework was developed based on user research, as well as adaptation of design methods and tools, and is intended to be applied as a workshop session with designers and users.

Systemic innovation in fashion requires not only new design approaches but also actionable steps that can be realistically integrated into current professional practices. Therefore, the framework was structured around a recognisable design process to ensure its feasibility and ease of adoption within existing industry contexts, increasing its potential for real-life implementation. It involves users in the early stages of the design process, and puts focus on exploring their needs and an exchange of perspectives. The direct result of the framework is not necessarily ready designs, but rather it serves as a set of inspirations and suggestions that can be later used to create a new collection. The framework aims to balance user participation with the expertise of designers, ensuring that users contribute meaningfully to the process while designers retain their specialised skills in translating insights into feasible designs. In the following sections we provide a summary of each component of the framework.

STEP ONE: RESEARCH AND BRAND DNA

The goal of this stage is to prepare diverse visual materials that can serve as an inspiration in the participatory session, and reflect the core of the fashion brand. This task is assigned to designers, as it allows them to use their skills and experience to conduct research, find the direction and choose materials. The visual materials that can be prepared in this stage include: silhouettes, shapes, prints and patterns, examples of garment details and finishings, and imagery conveying specific mood they want to evoke. This can be achieved through collecting images, fabric and colour swatches, examples of trims or any other finishings they find

relevant.

STEP TWO: UNDERSTANDING THE USER

The aim of this stage is to allow for an exchange of users' needs and values, and the values and niche on the market represented by the designers. This can be facilitated through creating a user profile, which allows all participants to engage in working together and bring in multiple perspectives into creating a target user persona. This step encourages discussions on users' fashion consumption habits, emotional connection to clothing, and sustainability concerns, integrating these perspectives early in the design process. The user profile will also be used in the following stage.

STEP THREE: DEFINING FUNCTION THROUGH STORYTELLING

This part reverses the traditional fashion design process, which firstly focuses on the visual aspects of a collection, and instead concentrates on outlining the function of the designed clothing through a storytelling approach. Prioritising function over aesthetics shifts the focus from trend-driven consumption to purposeful design, promoting versatility, durability, and more conscious fashion choices. The participants build a short story using the user profile from the previous stage. While visualising the activities the user encounters in daily life, they are able to match them with specific clothing needed for such occasions. Adding prompts here can direct the participants to discuss and define specific garments, fabrics or other elements, in order to keep their focus on the fashion aspect of the activity.

STEP FOUR: BUILDING IDENTITY THROUGH AESTHETICS

The goal of this stage is to create a visual representation of previously defined clothing in a form of a mood-board, that can later serve the designers to develop a collection and balance the visual brand identity to the users' style. By aligning aesthetics with user needs this stage can reinforce longevity and mindful material selection. It also allows the users to identify with the brand through visual representation. Through creating a moodboard, participants can build up on the ideas from the previous exercise but make them visual, and match functions to specific styles, colours, prints and fabrics. In this stage, they can use the materials prepared by the brand in the pre-workshop stage, as



Fig. 01

well as their own notes and sketches.

STEP FIVE: USER-TESTING

The final step is an element of user-testing, which is not traditionally conducted within the fashion industry. The garment test probes evaluate the garments against user needs and expectations and allow them to interact with finished prototypes. By incorporating user feedback on quality, functionality, and aesthetics, this step can help brands refine designs to better align with sustainable user preferences. The users who participated in the session, receive a garment from the developed collection, together with a questionnaire about their insights referring to the functionality, quality and aesthetic aspects. This step can allow the brand to gather feedback and further improve their prototypes before the release.

METHODOLOGY

GATHERING USER DATA

A survey was conducted to gather sample insights about the users and their unmet needs in the context of fashion. The survey's questions ranged from yes/no to multiple choice to open-ended to

opinion scale, collecting both quantitative and qualitative data.

The questions were shaped to first observe general shopping behaviour, and consequently dive into experience with materials, sizing, quality and overall satisfaction with the clothing available on the market. The survey was concluded with questions about potential interest in participatory design.

The analysis of quantitative data allowed us to observe trends and patterns on fashion behaviours, satisfaction and the opinions of the users. The data used for the qualitative analysis was collected from the open-ended questions of the survey. The answers were clustered using the bottom-up approach and grouped into four main themes: user satisfaction, user needs, fabrics and user involvement. Some of the repeating patterns in this section included users who believe that they do not possess enough knowledge on fashion; those concerned with the relationship between price and quality; looking for functionality, quality and comfort; looking for diversity on the market; emphasising the importance of sustainability in fashion and users concerned with the fabric choices.

ADAPTING FASHION DESIGN METHODS

The traditional fashion design process begins with research and design development. In order to replicate trends for the upcoming collection, trend research is conducted to identify leading fashion brands and designers. Design teams conduct desk research by analysing design shows, forecasting services and social media. Shopping trips to major fashion cities or trade shows can be used for primary research (Munasinghe et al., 2022). Trends are later used to establish main themes of new collections. Moodboards with silhouettes, colours, fabric swatches, inspiration images and keywords are created for each theme. Fabrics play a crucial role in the process, as they require time to produce (Munasinghe et al., 2022). In further stages of the design process, more technical aspects such as specific shapes, finishes and sizing are defined. After designs are finalised, garment technical documentation is prepared with all necessary details about each design.

Recognising the key steps of the fashion design process was necessary to establish the opportunities for including the users in the process, and to find methods and tools that can be adapted

for the use of both design professionals and the users. The comparison of conventional elements of the fashion design process with the user needs highlighted by the survey allowed us to recognise the gaps that can be filled through the framework contribution.

SCHEME FOR ESTABLISHING THE FRAMEWORK

Drawing from the fashion design methods and the co-design approaches, the scheme of the framework for a participatory approach for fashion design has emerged (Fig. 02). The scheme is built around the participation of designers, users and facilitators, where a designer can also serve as a facilitator. While designers bring in their expertise on traditional design techniques and methods, the users, as *experts of their experience* (Scariot et al., 2012) contribute by expressing their needs, habits and expectations. The role of facilitator is to enable better communication between the two groups.

We applied a generative design approach to the process of designing garments in order to help create a framework that will facilitate participatory approach through accessing collective creativity. It enables recognising more insights because of collaboration of participants with various ways of thinking.

The proposed framework has to fit the unique aspects of the fashion industry - the nature of materials used (fabrics), the goal of applicability on the human body and the physical aspects of the final products: garments. The aim is to inspire designers to later create final garment designs, help discover users' needs in the process, raise their awareness about the fashion industry and foster sustainable behaviours.

TESTING THE FRAMEWORK

As the next step in framework development, two workshops were held to investigate how the participatory approach can be incorporated into the fashion design process, test the framework developed, and gather insights from the participants. The first session was held in person, with integrated design students and a designer-facilitator representing a fictitious brand. The second one was held online, with a fashion brand - a small business focused on size- and gender-inclusive clothing and accessories, incorporating sustainable practices such as the use of ethically sourced fabrics and repurposing of reclaimed textiles. A designer, a group of customers, and a facilitator-ob-

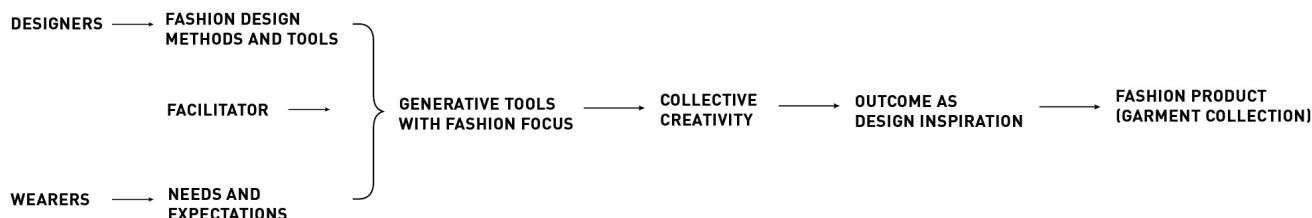


Fig. 02

server joined the second workshop. Participants in each workshop were introduced to the framework's steps and given access to materials prepared before the session. At the end participants filled out an anonymous feedback form. Workshop overview is summarised in Table 01.

WORKSHOP RESULTS

Through observation of participant interactions, analysis of workshop outcomes, and feedback forms, the workshops enabled us to gain additional insights into the research field and framework. Each workshop created a set of inspiration boards, including a user profile, storyboards, and moodboards (Fig. 03).

Through the duration of the workshops, certain freedom of interpretation was allowed in order to observe how participants interact with prepared tasks. Both groups were introduced to the objectives of the workshop and the details of each stage.

The comparison of the workshops revealed that the framework itself is adaptable and can be tailored to the specific needs of a project. While in workshop one, participants created three separate story-lines related to their character, which could

be interpreted into three separate product groups, in workshop two, participants developed a story with three consecutive steps, which could be further turned into one product with versatile aspects. Depending on the desired outcome, the workshop facilitators could either allow for flexibility of interpretation or guide the participants in a specific direction.

The brand presence was crucial to the course of the workshop. Knowing the brand brought the participants together, as they not only recognised its style and visual language, but also identified themselves with its values. This allowed for a smoother collaboration.

The users' limited previous experience with design tools and methods was beneficial to gathering information on their needs. While completing the steps of the workshop, the users focused on bringing their real-life experiences into the process, which allowed the teams to address specific issues. In contrast, design students, despite having no previous fashion background, continued to detach themselves from their own personal experiences and focus on creating a specific persona and their story.

Based on participants' engagement in the

Participatory workshops	Format	Participants	Duration	Outcome	Focus
Workshop 1	In person	6 design students Designer-facilitator	2h	User profile, 3 situation story boards, Moodboard	What mechanisms allow the users to be integrated into the fashion design process through active participation?
Workshop 2	Online	Designer, Facilitator-observer, 3 users	1,5h	User profile, 3 consecutive story boards, Digital moodboard	How to facilitate a dialogue between a fashion brand and the users through the proposed framework?

Tab. 01

workshop, as well as their feedback, we observed their interest in learning about the fashion design process. Interest in the end product was also expressed by participants of the workshop with users.

DISCUSSION
OPPORTUNITIES AND IMPLICATIONS
FOR FURTHER RESEARCH

This paper contributes to the development of the co-design approach to fashion design by introducing a participatory framework to explore its impact on the development of sustainable behaviour change. Combining theoretical exploration and user-research enabled us to recognise how co-design, specifically a participatory approach, can be applied to the process of fashion design. The framework was created using a research-through-design approach, with the goal of encouraging designer-user collaboration.

The framework intends to engage participants in investigating user needs through a fashion lens. Users and designers who take part in a participatory decision become researchers of themselves, their needs, and their relationship with clothing. After the session, the designers are left to create

garment designs, giving them creative freedom, though limited by the use of resources created during the workshop. At the same time, they can apply their field-specific knowledge, skills, and experience.

While this framework integrates participatory design within existing industry structures, its long-term potential lies in evolving beyond conventional business models. By shifting the role of users from passive consumers to active contributors, it challenges the conventional designer-user dynamic and aligns with broader discussions on systemic change. From a Transition Design perspective, systemic change in fashion requires interventions at multiple levels, from individual behaviour to industry-wide practices (Odabasi et al., 2023). The framework currently focuses on integrating users into the design process within existing structures, yet its potential lies in contributing to a broader paradigm shift that challenges dominant production-consumption habits and redefines user engagement beyond conventional industry standards.

CHALLENGES, LIMITATIONS AND

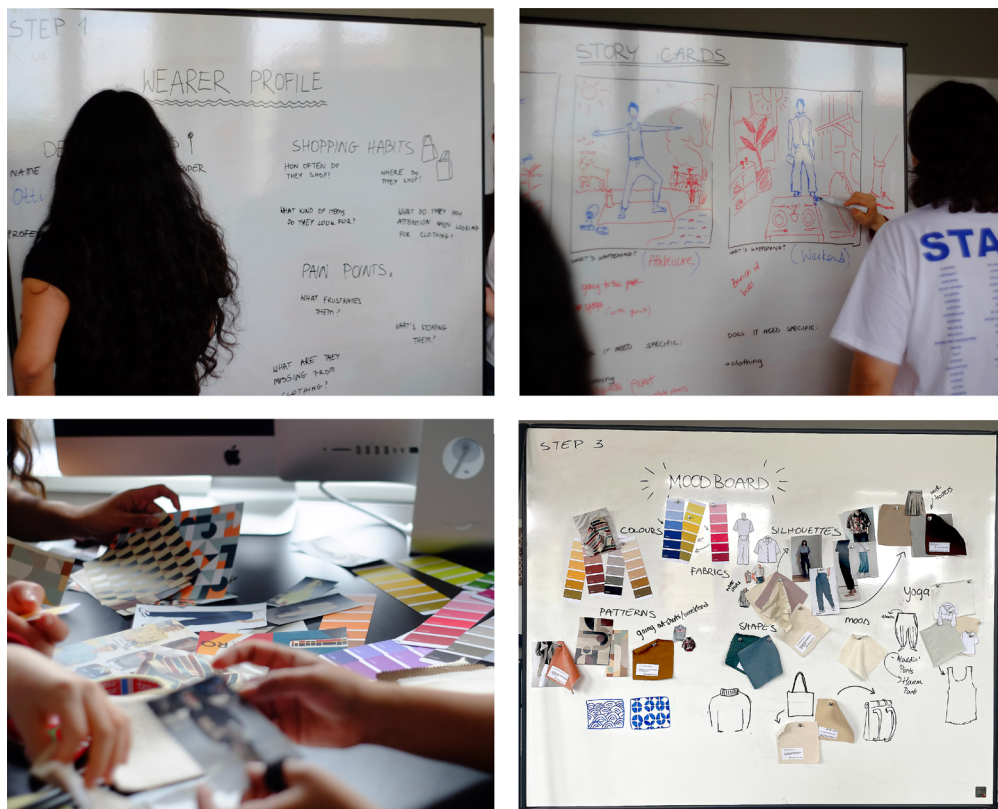


Fig. 03

FURTHER RESEARCH

However, this study is only one approach to the topic of co-design in fashion, and its findings have several limitations.

First, the framework has been developed and tested on a small scale. Exploring its long-term impact would require further development and industry collaboration with a diverse range of fashion companies. Second, due to the time-limitations of this study, the user-test stage was not included in the workshops. It would require further development and testing in order to fit it within the prototyping and manufacturing process, and development of user feedback forms. Workshop participants showed interest in the fashion design process, suggesting its educational value and potential to shape consumer perceptions and sustainable behaviours. Furthermore, future research could explore how participatory frameworks like this can evolve in alignment with transition strategies that emphasise long-term systemic transformation.

It would be beneficial to conduct a long-term study collaborating with brands willing to introduce the framework, develop and test products based on it, as well as the observing

customers-participants, their interactions with products and the impact on their behaviours. Engaging a more diverse group of stakeholders, for example technologists, managers, strategic planners or external partners could be tested in order to sensitise organisations to user-needs, encourage a broader exchange of perspectives and drive creation of new ideas.

Finally, we regard the framework as an initial state in theory developing process (Redström, 2017). We hope to inspire future researchers and design practitioners to adapt and expand this co-design fashion framework to match their needs. Nevertheless, the findings of this study suggest that the implementation of co-design approaches into the fashion design process is possible and has the potential to influence users' behaviour.

CAPTIONS

[Fig. 01] Participatory framework for fashion design.

[Fig. 02] Scheme for framework development.

[Fig. 03] Process and outcomes of workshop one.

[Tab. 01] Summary of Participatory Workshops Conducted.

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