

EXPLORATION OF USER INVOLVEMENT AND COLLABORATION  
IN A CO-DESIGN PROJECT:  
A CASE STUDY

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## Abbreviations

DfAW	Design for Ageing Well research project
ESRC	Economic and Social Research Council
NDA	The New Dynamics of Ageing programme
NGO	Non-governmental organisation
NHS	National Health Service
PPI	Public involvement
UAG	User Advisory Group
UCD	User-centred design
UOD	User oriented design
URG	User Reference Group
WP	Work package

## Terminology and key concepts

<b>Case study</b>	A well-established research strategy where the focus is on a case (which is interpreted very widely, to include the study of an individual person, a group, a setting, an organisation, etc.) in its own right, taking its context into account. Typically involves multiple methods of data collection. <sup>1</sup>
<b>Co-design</b>	This means designing together. Co-designers are professional designers, other professionals, amateurs and citizens who identify problems, needs and challenges, develop a design brief and then design the solution or outcome together. <sup>2</sup>
<b>Collaboration</b>	This is a way of working together to combine intellectual, practical and aesthetic capabilities to a greater effect than working alone. <sup>2</sup>
<b>Community</b>	A group or network of people tied together with social relations that are important for their social identity and social practice; with the advent of the internet, the term has been extended to virtual and online communities. <sup>2</sup>
<b>Design activist</b>	A ‘non-aligned social broker and catalyst; a facilitator; an author; a creator; a co-author; and a ‘happener’ (someone who makes things happen). <sup>2</sup>
<b>Design for sustainability</b>	Any design practice oriented towards development which balances environmental, social and economic impacts and concerns for sustaining the present and future.

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<sup>1</sup> (Robson, 2002, p. 135)

<sup>2</sup> (Fuad-Luke, Hirscher, & Moebus, 2015, pp. 24–26)

<b>Design probes</b>	A design method developed in the mid to late 1990s at the Royal College of Art, London, UK, by Bill Gaver, Antony Dunne and Elena Pacenti. Probes aim to explore the lives and habits of people as they interact with objects, products and spaces by giving them the means to record and reflect on their everyday practices. The means may be a diary, a camera, a set of questions, visual prompts or other devices, to enable the people to document their lives so that designers and design researchers may better understand the issues people face and their needs. <sup>3</sup>
<b>Design thinking</b>	Design-specific cognitive activities that designers apply during the process of designing: combining empathy with the context of a problem. <sup>3</sup>
<b>Do-it-together (DIT)</b>	An emerging movement originating from do-it-yourself (DIY), where activities are done together in a group, not alone, for mutual benefit. <sup>3</sup>
<b>Do-it-yourself (DIY)</b>	The method of building, repairing and modifying without the aid of professionals, taken up by environmental movements and ordinary citizens in the 1960s and 1970s, and continuing today. <sup>3</sup>
<b>Empower</b>	The process of encouraging and developing the skills to enable people to become self-sufficient and autonomous, with the goal of eliminating future need for charity or welfare. <sup>3</sup>
<b>Focus group</b>	A form of qualitative research in which a group are asked about their perceptions, opinions, beliefs, and attitudes towards a product, service, concept, advertisement, idea, or packaging. Questions are asked

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<sup>3</sup> (Fuad-Luke et al., 2015, p. 26)

in an interactive group setting where participants are free to talk with other group members.<sup>4</sup>

**Grassroots approach**

Grassroots refers to the origination of ideas and activities plus, potentially, community, social and political change, through initiatives led by local people or by an online network focused on specific issues, or by other social groups often outside traditional political power structures. It is a 'can-do' approach characterised by social and/or cultural actions.<sup>5</sup>

**Inclusive design**

The design of mainstream products and/or services that are accessible to, and usable by, as many people as reasonably possible without the need for special adaptation or specialised design.<sup>6</sup>

**Intellectual property**

Patents, copyrights and trademarks are all examples of intellectual property that is owned by the creators and can be exploited by them or anyone to whom they legally agree to give a licence, giving them the rights of exploitation.<sup>6</sup>

**Mutual learning**

A learning model based on mutual respect and dialogue between teacher and student, where roles are interchangeable and experiences on both sides enriching and transformative.<sup>6</sup>

**Online community**

A virtual community whose members interact with each other mostly via the internet.<sup>7</sup>

**Open brand**

A concept originated by Openwear: a platform for sharing open fashion designs, to demonstrate that the brand can be open and shared too.<sup>7</sup>

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<sup>4</sup> (Focus Group, Wikipedia 2016)

<sup>5</sup> (Fuad-Luke et al., 2015, pp. 27–30)

<sup>6</sup> (Inclusive design, Designing Buildings Wiki 2016)

<sup>7</sup> (Fuad-Luke et al., 2015, pp. 30–32)

<b>Open design</b>	Emerging in the 1990s, open design was defined in 2010 in the seminal book, <i>Open Design Now</i> , by Van Abel et al., as ‘design whose makers allowed its free distribution and documentation and permitted modifications and derivations of it’. Today, the open design movement embraces everything from 3D printing and digital fabrication technologies to basic ‘how-to’ blueprints, patterns and instructions for DIY and DIT designs. It frequently involves collaborative designs and designing within specialist and/or generalist communities, from FabLabs to Maker Fairs and vast online platforms like Etsy and Instructables. <sup>7</sup>
<b>Participant end-users</b>	People who participate in the ideation, testing, creating, and ultimately use of a designed product, service, space, building or experience. <sup>7</sup>
<b>Participatory</b>	This refers to a process or experience where people are individually encouraged, and feel able to, contribute to a collective act. <sup>7</sup>
<b>Participatory design (PD)</b>	An approach to design attempting to actively involve all stakeholders in the design process to help ensure the results meet their needs and are usable. It was first recognised as a design approach in the 1960s in Scandinavia to help with the transition to more automated work practices in factories, but has evolved over the years to bring in the expertise of professionals, users, customers and, more recently, citizens, to share their experiences and generate more efficient and meaningful solutions. PD crosses with other participatory design approaches and methods including user-centred design, co-design and open design. <sup>8</sup>

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<sup>8</sup> (Fuad-Luke et al., 2015, pp. 31–34)

<b>Participatory workshop</b>	An organised event which brings a group of people together to seek their opinions, extract their knowledge and to solve problems in a collaborative and creative environment. <sup>9</sup>
<b>Public involvement</b>	Doing research ‘with’ or ‘by’ the public, rather than ‘to’, ‘about’ or ‘for’ the public. This would include, for example, public involvement in advising on a research project, assisting in the design of a project, or in carrying out the research. <sup>10</sup>
<b>Re-design</b>	The reconfiguration of what already exists, possibly by bringing in new ingredients and smartly combining them to create something new. <sup>8</sup>
<b>Re-use</b>	Putting discarded things and materials back to use, by re-purposing or modifying them. <sup>8</sup>
<b>Reality</b>	The state of things as they actually exist, not as they seem or are imagined; everything that is, has been, or will be; also refers to worldviews and ways of perceiving reality differently. <sup>8</sup>
<b>Service design</b>	The activity of planning and organising people, infrastructure, communication and material components of a service in order to improve its quality and the interaction between service provider and customers. <sup>11</sup>
<b>Social design</b>	Also known as socially useful design, socially responsible design, social innovation design, or design for social innovation. It encourages grassroots and community creativity and focuses on the satisfaction of human needs, local services, economic development and livelihoods often framed within local/national

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<sup>9</sup> (Jisc, 2012)

<sup>10</sup> (Staley, 2009, p. 13)

<sup>11</sup> (Fuad-Luke et al., 2015, p. 34)



government agendas. It includes strategic design thinking, co-design and other processes aimed at participation, and it involves professional design thinking, co-design and other processes aimed at participation, and it also involves professional designers working with people who do not think of themselves as designers.<sup>11</sup>

**Stakeholders**

Any person, group, community or organisation that has a share or interest in a project, enterprise or specific contextual situation.<sup>11</sup>

**Transdisciplinary**

Refers to research, knowledge and ways of thinking and doing which cross and hybridise many disciplinary boundaries to create a holistic approach and a body of knowledge which transcends the original contributions.<sup>12</sup>

**User-involvement**

Refers to ways of applying the experience of the ‘user’ of a product , service or experience to improve the creative process and consequently, improve the final designs or outputs, for example, as in user-centred design (UCD).<sup>12</sup>

**User-centred design**

Design that focuses on the needs of the user.

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<sup>12</sup> (Fuad-Luke et al., 2015, pp. 36–37)

# Abstract

## Introduction

Collaborative design (co-design) is an approach that includes 'users' in the design process. This approach is growing in popularity amongst companies seeking to develop a competitive advantage in the field of outdoor clothing and equipment. Health research is steadily developing a substantial evidence base of the effectiveness of public involvement in research, however, in the co-design research field, there is a less developed evidence base concerning user involvement aspects. This qualitative case study presents an exploration of the factors that influence the experience of user involvement in a study utilising a co-design approach. The case concerned is the New Dynamics of Ageing-funded study 'Design for Ageing Well', which presented an opportunity to explore both the co-design mechanisms utilised along with the experiences of the individuals involved in the study. They included research team members, project partners (e.g., outdoor clothing manufacturers), User Reference Group members (members of the public) and User Advisory Group members (also members of the public).

## Methods

A single case study approach was utilised. Sampling was purposeful, taken from the above four groups of stakeholders. Data collection methods included one-to-one semi-structured interviews (35 people) and non-participant observations (44 total hours).

## Findings

This study demonstrated that strong project management, including leadership and change management, is crucial for a successful co-design experience. A clear vision, plus the aim and purpose of the co-design process, need to be communicated to all stakeholders.

The three main factors that impact public involvement in co-design are:

- The facilitator's knowledge and skills regarding co-design methods and moderation
- Multidisciplinary collaboration
- The management of the co-design setting.

## Conclusion

Effective public involvement in co-design research requires suitable leadership, project management, and a clear communication strategy, and attention should be paid to the facilitation and management of the co-design setting. These objectives are best achieved when user needs are heard and embedded in all aspects of the co-design approach.

# CHAPTER 1. INTRODUCTION

This study investigates the factors that facilitate and hamper co-design projects. The introductory chapter presents the problem statement, the purpose and the significance of this study. It begins with an overview of the UK's Economic and Social Research Council (ESRC) funded collaborative study Design for Ageing Well (DfAW), which provided the research setting for the case study. This is followed by the presentation of the context and an investigation of the nature of the research problem. The chapter continues with the research aim and objectives. The researcher's position is then considered. The chapter finishes with an overview of the structure of the thesis.

## **The Design for Ageing Well research project**

This thesis was developed during one of three PhD research studentships funded by the UK's Economic and Social Research Council (ESRC) and attached to the Design for Ageing Well (DfAW) collaborative research project. Utilising user-centred co-design methods, the DfAW project aimed to design and develop a functional clothing system with embedded technologies to promote the healthy ageing, autonomy and independence of older people. The DfAW project commenced in January 2009 and was completed in November 2012. The project was funded by the joint UK research councils and administered by the Economic and Social Research Council (ESRC) under the New Dynamics of Ageing (NDA) programme.

The DfAW project was conceived on the premise that the potential benefits of smart and functional textiles, new garment manufacturing techniques, wearables and smart mobile phone technologies were not widely recognised by the older population. A cross-disciplinary and participatory design approach was devised to address this relatively new notion of embedding technology into garments. The DfAW project

involved five university partners, who contributed with their efforts divided into three work packages.

WP 1 (Behaviour) was undertaken jointly by the University of Westminster and the University of Salford. The aim of WP 1 was to research user needs. I was asked to join WP 1 by the project lead. WP 2 (Clothing) was led by the University of Wales (Newport) with input from the University of Brighton. Developing the prototypes according to users' needs was the primary goal of WP 2. WP 3 (Technology) was run by the University of Ulster. The goal of WP 3 was to develop a smartphone app and wearable technology. The DfAW had two user groups: the User Reference Group, situated in Newport, Wales, and the User Advisory Group, in Salford.

## **Overview of the conduct of the DfAW project**

This section describes an overview of the undertaking of the DfAW project. Prior to it starting, a one-year preparatory network project was conducted to inform the development of the bid, which was then successful. The user population to be sampled during my own research was originally one group (the User Advisory Group), but the DfAW unexpectedly took a two-group approach (with an additional User Reference Group). This provided a more diverse sample for me and the opportunity for comparison between the two user groups, which took different approaches.

## **User Reference Group**

One objective of the DfAW project was to create better fitting outdoor clothing for older people. In January 2010, there was a piloting workshop in Wales led by the University of Salford, where moderator skills were taught to other team members in readiness for working with members of the public. In order to produce well-fitting garments, the project then set out to do body scanning of members of the public to identify the common shapes and sizes. The volunteers, aged between 60 and 75, were selected to match UK national measurements for older people's BMIs. This activity unexpectedly led to a User Reference Group being set up in May 2010 in Wales, where

the project lead was based, where the original plan had been to only have a single User Advisory Group operating out of Salford.

I officially started my PhD in July 2010 and joined the DfAW project, which centred around 15 workshops. Before I officially joined the project, I took part in two workshops in May 2010, which focused on clothing and technology and aimed to develop a new shared language between the participants from different study backgrounds. The three following workshops (in the autumn) focused on each layer of clothing, from the base layer to the outer layer.

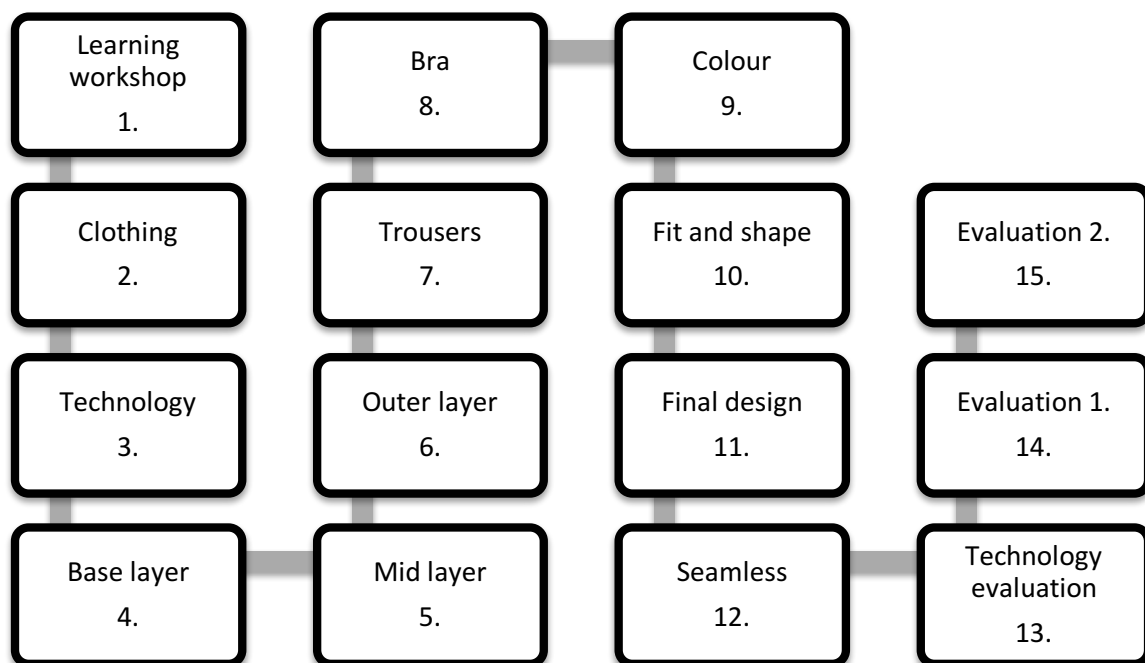


Figure 1. *The order of the 15 DfAW workshops*

These three workshops were all scheduled in the same way. In the morning, there was a 'show and tell' session, where the older participants presented their own walking clothing, and in the afternoon, new styles and materials were introduced by the industry, and participants commented on them. In the bra workshop, the participants were, naturally, only women. In these workshops, different options were presented, and stakeholders discussed their preferred choices. The colour workshop concentrated on preferred age-appropriate colours, colour families and combinations.

In the morning, there was a presentation to put into context the effects of the commercial cycle that normally influences colour selection within the fashion trade.

'The fit and shape workshop' focused on the size, fit and style of the garments. The older users contributed to the design selection, with styles illustrated by designers and collected onto collection boards in July 2011. From here, the project lead led the technical development of the initial designs. The prototypes were manufactured by several industrial partners. The resulting prototypes, as well as the wearable technology, were evaluated in two further workshops. The last evaluation workshop was held in May 2012. All these workshops were videotaped by the DfAW team members.

### **User Advisory Group**

Whilst there had been an agreement over the study design for the user groups, this evolved rapidly when the project lead set up the User Reference Group in Wales. The University of Salford partners still had a user group to set up with a meaningful purpose, as they had funding to do. Therefore, another group was established in Salford in November 2010, and named the User Advisory Group (UAG). This caused some challenges for the DfAW project as the roles of the two groups were carved out. The UAG ended up meeting for the first time six months after the URG was up and running. Some of these challenges are explored in this thesis, but what is important is that it presented me with two user groups to research and not one, as was initially expected.

In the first UAG meeting in Salford, the nature of the advisory group and the topic of the DfAW research project was introduced to advisors at the same time as they also introduced themselves. Because the group consisted only of women, the members of the group recruited some men from their walking group to balance the gender division. At the time of third advisory group meeting, there was still the idea of conducting a larger field study, observing walkers. The advisors consulted on the study recruitment poster and the information sheet. This discussion was a very good

example of the importance of the moderator in collaborative design meetings. The UAG also carried out three field trips. One was an organised walk, where recording equipment was tested.

The UAG made a trip to the showroom of the outdoor brand Sprayway, where the most 'real-life' co-design workshop was held. The designer gave a lecture about the design and development process of outdoor clothing. The advisors were given the task of picking up a combination of the clothes that they liked most, and then giving a critique of them. The third field trip was to downtown central Manchester. The method called 'Mystery shopping' was used to gain knowledge of how older people were treated in an outdoor shop, and to see if they got the information and advice they needed. In the last evaluation workshop, the project prototypes were presented to the advisors, and they could give a critique with 'fresh eyes', because they were not as immersed in the design processes of the URG co-design workshops in Wales. The lead of Work Package 1, who was responsible for the UAG, believed it never had a meaningful purpose in the project, as much of its intended purpose was taken over by the URG. Despite the advertised focus of my PhD studentship and the significantly different DfAW project design, I was able to determine a focus for my thesis that met my own needs and those of the DfAW project. The primary focus of my research was to broaden the understanding of what makes a 'good' co-design experience. The two user groups provided me with ample opportunity to explore which factors aid or hamper effective user involvement and collaboration in co-design projects.

### **Research team members**

As well as users providing an available sample, the team members were also available and included administrative staff. The team members were from multiple disciplines and included both junior and senior professionals.



## **Project partners**

The final group to be sampled was the project partners, who comprised an outdoor brand owner, a designer and senior advisors.

## **The context and purpose**

This section introduces the concept of co-design and provides an overview of its importance, but also serves as a rationale for why the quality of user involvement and collaboration in co-design is essential to its success.

Collaborative design (co-design) is an umbrella term for different approaches to participatory design and refers to designing 'with' the users, instead of only 'for' the users of the product (Fuad-Luke, 2009; Sanders, 2002). There are a wide variety of co-design methods that can be adopted when engaging users in the design process (Hanington & Martin, 2012). Fuad-Luke (2009) describes co-design as a design process which includes all stakeholders, from designers to possible future users, and facilitates the discussion of their views about design. Carroll (2006, p. 4) agrees with this suggestion:

*“The essence of co-design is founded on the principle that people who end up using a designed artefact are entitled to have a voice in determining how the artefact is designed.”*

A successful co-design process might have positive effects on the environmental, social and economic aspects of design, and Sanders (2001) suggests that the collective creativity of the design process can lead to useful and relevant innovations as well as increasing the quality or even the sustainability of products. The UK Design Council (2011) gives several rationales for implementing co-design. Firstly, it suggests that co-design can be seen as a fresh way to innovate and create a competitive advantage for businesses (Design Council, 2011). Secondly, it can ensure that the services of the public sector deliver what the public wants and needs (Design Council, 2011). Thirdly,

co-design can offer a successful and authentic solution to a problem by working with the people (Design Council, 2011).

By 2008, it had already been noted that the participation of users in the design process was becoming more popular (Buur & Matthews, 2008). Co-design is currently very topical due to the ways that the internet and social media have introduced new methods for user engagement, and companies realising the benefits of user-centred design. This research is based on the hypothesis that when increasing numbers of companies begin to adopt co-design methods and engage users in their design processes, it is important that good practices of public involvement and collaboration are emphasised and the impact on the users involved is considered.

Although the added value of user engagement is becoming widely accepted among design theorists and academic researchers in the design field, companies have been relatively slow to adopt co-innovation into their processes (Buur & Matthews, 2008). One of the reasons is that co-designing is time-consuming and requires a set of skills that differs from those needed in traditional design (Jisc, 2012). The facilitation of co-design workshops is a talent in itself and needs to be learned (Jisc, 2012).

Recent studies (Détienne, Baker, & Burkhardt, 2012; Feast, 2012) in the design field have looked at the quality of engagement in design, but user involvement in co-design and multi-disciplinary collaboration when designing functional outdoor clothing, especially for older people, lacks research. The problem merits further investigation to shed light on issues related to user engagement and collaboration in co-design.

## **Global challenges**

Sustainability and demographic change are important and relevant global challenges. These issues are very complex, and there are no quick-fix solutions. Conscious co-design and innovations can, however, play a part in solving these problems. Design is an action that manifests the visual world. Designers have an opportunity to improve people's lives by creating well thought-through, responsible and user-aware design

(Fuad-Luke, 2009). Fuad-Luke (2009) introduced the term 'design activism'. He describes a design activist as a co-creator and facilitator who can use design to help find solutions to environmental or social problems (Fuad-Luke, 2009). Back in the 1970s, Papanek (1970) suggested that designers are responsible for considering the environmental, social, economic and political consequences of design.

Sustainable development is a concept that was in fact created in the 1970s, when environmental problems started to gain more attention (Du Pisani, 2006). A sustainability approach can be adopted into any field of human activity, and sustainable thinking has been increasingly influencing design disciplines (Fletcher, 2008). The sustainability concept can be divided into four aspects: environmental, social, cultural and economic (Suojanen, 1997). Corporate responsibility in the outdoor industry is growing in importance and has become a critical issue that cannot be underestimated (European Outdoor Group, 2016). It is likely that in future, legislation will be firmer and companies will be compelled to work towards more environmentally and socially responsible business practices.

From a sustainability viewpoint, the end-user has a significant impact on the final environmental footprint of the product, because a big part of the environmental impact of clothing comes from the washing of and caring for the product (Fletcher, 2014). User behaviour also affects the lifespan of the product. Therefore, one hypothesis is that a user-centred design approach plays an important role from a sustainability perspective as well. If a product is well designed to be fit-for-purpose, with the user properly considered at the design stage, it increases the likelihood that the product will perform well and that the user will be more motivated to take good care of the product. No brand or manufacturer can readily offer emotional design (Norman, 2004), but in my opinion, a product is more likely to create an emotional attachment if it works well for the intended use and is ethically manufactured, so the end-user can be proud of it. Another hypothesis is that if outdoor clothing companies adopted co-design techniques in their development processes, they could be more sustainable and offer better products to different ages of consumer groups.

Another major global challenge is related to demographic change. The world's population of older people is rapidly growing (Cracknell, 2010), which has extensive societal effects and challenges. The World Health Organization (WHO) states that people over 60 are the fastest growing age group in almost every country (World Health Organization, 2016). In the UK, for example, the number of people over 65 is predicted to almost double from 10 million people to around 19 million people within the next forty years (Cracknell, 2010). The primary cause of this development is a rise in life expectancy together with a decline in birth rates (World Health Organization, 2011). This change can be seen as a triumph of public health, but poses a number of challenges, for example, 'age related diseases and disability', 'care for ageing populations', 'the feminization of ageing', 'ethics and inequities' and 'the economics of the ageing population' (World Health Organization, 2002).

Clarkson et al. (2003) believe that markets should be aware of an ageing population. There is a need for the design community to create products and environments that can be used by all generations, which also take into account that people of different ages regularly live in the same areas (Clarkson et al., 2003). Older people need to be considered at the right stage within the design process, so that many more products have the potential to be appropriate for people of all ages (Clarkson et al., 2003). Fisk et al. (2009) claim that usability is often enhanced for younger people as well when it is improved for older adults. Also, it is a key consideration that those over 60 are a heterogenic group, and that generalisations should be avoided (Moschis, 2003).

## **The research objectives and question**

This section is placed here to help orientate the reader, whilst the literature review section will show how I arrived at my study objectives and research questions. The purpose of my qualitative research was to explore user involvement and collaboration in co-design. The DfAW project provided the sample, the setting and the co-design activities for me to investigate in the study. The primary focus was to identify the best practices to engage users (older walkers between 60 and 75 years old) in the collaborative design process, concentrating on outdoor clothing. My appointment as

a team member meant I had the opportunity to be a participatory researcher for the DfAW project, as my role was to explore multidisciplinary co-operation in order to understand and explain the best practices of involving members of the public in design. This included collaboration in design research, design activity and product development.

The specific objectives were:

1. To identify the factors that affect the experiences of older people involved in design research, co-design and product development.
2. To critically examine trans-disciplinary research and identify factors which aid or hamper effective collaboration.
3. To develop evidence to inform the production of good practice guidance for the involvement of members of the public in design research, co-design and product development.

The research question was:

1. What are the factors that facilitate or hamper co-design projects?

This qualitative study primarily explores good practice in public involvement and contributes new insights into how the public can be better involved in the co-design process. The vehicle for this exploration is a case study of co-design in the development of functional outdoor clothing for older people.

## **The researcher's position**

When conducting a research study, it is vital for the researcher to understand that their own age, gender, and personal and professional background, all influence the researcher's approach. As a researcher, I have chosen a constructivism paradigm, which means that there is no single truth about reality and it is viewed subjectively by the observer. This means that my personal position influences the research. I was

invited to join this project because of my professional background in the outdoor clothing industry.

I have studied design for seven years, first completing a BA degree at the Häme School of Applied Sciences and then a Master of Arts degree at the University of Lapland (Finland). The principal focus of my studies has been functional outdoor clothing, and the topic of my master's dissertation was concerned with sustainability issues in outdoor clothing. My professional background includes having worked as an assistant designer, a fabric purchaser and a sustainability manager for a Finnish outdoor clothing company. As sustainability manager, I chaired the Standards and Regulations Committee in the European Outdoor Groups' Sustainability Working Group, and I belong to the Textile Institute's Sustainability Special Interest Group. Through my voluntary commitments, I have achieved a much broader perspective on the outdoor industry sector in Europe, especially in the area of sustainability. This perspective has both influenced my research and guided my research interests.

My background in the outdoor clothing field and interest in sustainability has influenced me as researcher. From a professional perspective, I consider that environmental and social responsibility should be a high priority in industrial manufacturing, and I believe that every successful company will need to integrate the principles of sustainability into their general business strategy in the near future. There are signs of growing interest in collaborative and open design. There is significant value in multi-disciplinary collaboration in design, business and non-governmental organisations. There are many possibilities for co-design to change the world to be more sustainable and inclusive for all. The driving force for this study was that co-design is becoming more popular and there are not many existing guidelines on how to carry it out. My goal is to influence the field by working towards evidence-based guidance to carry out co-design.

My interest lies in how to involve users so that they get the best possible experience. The user experience is an ethical matter and therefore it is important that participants feel empowered instead of used. Outdoor clothing brands rarely involve members of

the public in their design process. As an alternative, outdoor clothing brands often tackle user-centred design by involving sponsored athletes or 'lead users' in their design process, but this rarely includes casual users or older people, despite their increasing numbers. 'Lead-user' is the term introduced by von Hippel, meaning the users who are willing to try innovations before the market majority as a result of their willingness to try new ideas first (von Hippel, 2005). With this research, I am interested in supporting a change into involving casual users instead of just lead-users.

Due to changing demographics, there is increasing public demand for research into aspects of ageing. Meanwhile, there is also growing concern within the outdoor industry about protecting the outdoor environment. The design of technical outdoor clothing is attracting the concern of NGOs and government agencies, due to unsustainable processes within the supply chain. Also, due to climate change and the associated unpredictability of weather patterns, the need for innovations in outdoor clothing is increasing. Ageing and sustainability are global questions that have inspired me to do research and contribute to solutions. Key themes within this research, which are growing in importance, are sustainability, co-design, good practice of user engagement in co-design and team collaboration, with effective communication and a shared language.

## **Researcher's assumptions about the unique contribution**

The underlying assumption of the DfAW project was that 'smart, functional clothing' might encourage older people to go outside, and in that way help them to remain active, staying socially connected and independent for a longer time. Participatory user-centred design may increase the wellbeing of people by creating fit-for-purpose products, and participation in a collaborative design project in itself can be empowering for older people.

As collaborative design methods become increasingly popular, the importance of information on good practice in involving people in the process increases (Sanders,

2013). It is anticipated that the knowledge generated from this study will inform future evidence-based guidance about how to involve people in collaborative design and development projects. This evidence will include insights into public involvement in design research and co-design and product development processes, which will serve to expand the knowledge of public involvement in the design discipline and be of interest to research communities. There is a limited research evidence base about how to carry out co-design projects, and guidance in this study will increase knowledge about the good practice of co-design.

## **Chapter summary**

This chapter introduced the research topic and background for the study. The chapter provided my research objectives and question. There is a lack of evidence-based research about successful co-design projects with users, and the DfAW project gave me an opportunity for this case study to research co-design processes. I presented my personal background and my assumptions about the unique contribution of the project. Concluding this chapter, it may be argued that this topic requires investigation.



## **Thesis overview**

This thesis includes a further eight chapters:

Chapter 2. Literature review: presents the literature related to older people, public involvement and design approaches.

Chapter 3. Methodology: discusses the methodology choices and rationale for choosing a qualitative research enquiry and case study methodology.

Chapter 4. Methods: presents the research methods used.

Chapter 5. Data collection: describes the sample and data collection plan and the actual process of gathering data for the study.

Chapter 6. Data analysis: focuses on the original plan for how the collected data was to be analysed and the actual analysis process that took place.

Chapter 7. Findings: presents the results of the study. The chapter is divided into four parts, each presenting the findings for one stakeholder group.

Chapter 8. Discussion: includes a discussion of the methodology, a discussion of the used methods and a discussion of the findings.

Chapter 9. Conclusions: considers the unique contribution and recommendations of the thesis.

## **CHAPTER 2. LITERATURE REVIEW**

Existing knowledge and theory is important in any research. This section aims to review and discuss the ways in which literature has been used in the thesis, including an example of a systematized literature search process. This is followed by a critical analysis of the selected literature organised in three key themes: older people, public involvement and design approaches. Finally, key concepts from the reviewed literature will be synthesised to highlight the position of the thesis in relation to the existing knowledge and understanding.

### **Part 1. Literature review methods**

The aim of my literature review is to lay out the background of this research project in order to fully understand the context of this research. Conducting a literature review is an important and common practice while undertaking research, and a number of reasons can be given for its importance (Hart, 2009; Ridley, 2008). At the onset of a study, finding and reading the existing literature, including previously conducted research, creates a deep understanding of the topic and what has been done previously (Hart, 2009; Ridley, 2008; Rowley & Slack, 2004). Reviewing relevant literature also helps identify areas where research has not yet been undertaken, or where knowledge is limited (Hart, 2009). Furthermore, knowledge of how the research topic has been researched previously can suggest appropriate research methods (Hart, 2009; Rowley, 2004). Importantly, an awareness of existing literature can prevent unnecessary replication (Ridley, 2008), ensuring that studies build on and develop what is already known.

Machi and McEvoy (2016) highlight the need for critical self-assessment in the literature review process in order to minimise the effect of personal biases and positions. There are several different review types to choose from (Grant, Booth, & Centre, 2009) and this review used features of the systematized review to avoid bias.

The next section reveals the purpose of this review and the questions that the literature review aims to answer.

## **Purpose and questions of the literature review**

I conducted two different kinds of literature searches, both thematic and systematic literature searches. This included both a broad literature review to establish the wider background and context for the study, and a specific systematized search to identify the existing research-based knowledge and evidence. The primary thematic literature search, which enabled me to identify the relevant background, was made in 2010. Continuous attention was paid to upcoming research papers during the study. The final systematised literature search was made between February 2016 and March 2016, in order to find relevant research evidence.

The purpose of the systematized literature review was to find out what research has been published about the topic previously, and to critically assess existing knowledge. The research question was:

- What are the factors that facilitate or hamper co-design projects?

The objective of the systematized literature search was to find out who has researched the topic before, what they found, and thus, overall, what is known about user involvement and collaboration in co-design projects. The following questions were set for the literature search:

- What is known about organising co-design projects with older users?
- Is there evidence-based research about user involvement in co-design projects?
- Is there evidence-based research about collaboration and communication in multi-disciplinary co-design projects that involved users?

## Thematic search

The thematic search was undertaken to establish broad context and background and formed the basis for the narrative review I present in the rest of the chapter.

The broad background and context of the study was established through an iterative process of thematic searching. The themes (see Figure 2.) were derived from the research question and objectives. Design approaches related to user-centred design, inclusive design and co-design were identified as important topics relating to the research aims. Public involvement and older people were recognised to be important background topics, and the literature was searched separately for these. The three topics above form the literature review. These topics are derived from my research question and objectives.

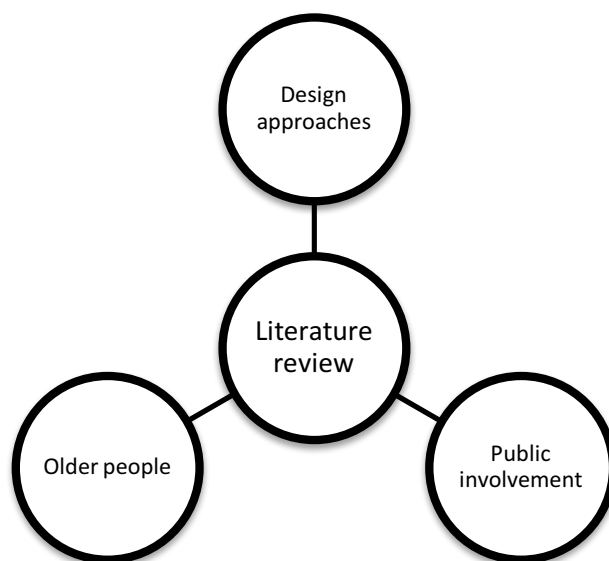


Figure 2. *Background to the research*

I included relevant research papers, books and internet webpages from the topics, which were hand searched. The thematic search utilised the following databases, Ebsco host, Taylor & Francis online, Sage journals and Emerald, using keywords derived from the themes. This process identified relevant academic papers, books,

reports and other literature. The research papers were peer reviewed and books were identified as being written by experts in the field. Website searching helped to identify key sources of information and grey literature that are not always visible in academic databases. In addition, a key academic journal ‘CoDesign’ was hand searched, with all the abstracts starting from the year 2005 reviewed, to make sure that my keywords and inclusion criteria were right. Whilst some papers described research that included co-design methods, none focused on good practice in the co-design process. According to this search, there was a gap in knowledge and this study will make a doctoral level contribution. Methodology and method literature was searched separately to find appropriate material for qualitative research.

## Systematized search

The systematised search was undertaken to look specifically for empirical research and evidence-based knowledge on the topic, and establish it as an under-researched issue. The intersection in the following figure presents the information I wanted to find from the research literature (see Figure 3.). The key words were grouped to represent each of these themes and the Boolean operator search should have brought up the intersection literature. Literature search engines use Boolean operators to find literature, plus mathematical sets and database logic. They connect the search words together to either narrow or broaden the set of results. The three basic Boolean operators are: AND, OR, and NOT (MITLibraries, 2017). They connect multiple pieces of information with several search terms to find searched information.

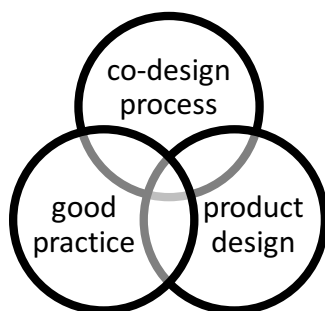


Figure 3. *Research focus*

## **An example of a systematized literature search**

### **Inclusion and exclusion criteria**

Inclusion and exclusion criteria mean factors that define what literature is accepted into the literature review. This is a matter of relevance and quality of research. I decided to have seven inclusion criteria that I used when selecting papers. These inclusion and exclusion criteria were derived from my research question and my experience in the field.

### **Product**

The first inclusion criterion was only to study literature about co-design projects where a concrete product was designed. The concrete artefact could have been any physical object or product. This meant that the co-design activity needed to be focused on designing a product or an item of clothing. The concrete artefact design criterion was required because the design processes for immaterial things and services are completely different. Research about service design and software design was excluded. Studies about community engagement projects and the built environment were also excluded.

### **Physical presence**

A further inclusion criterion was that users needed to be physically present in the co-design activity. Design projects that did not require a physical presence, for example online design projects, were excluded, because they use completely different co-design methods.

### **Co-design as the aim of the research**

There are many research papers about co-designing products, services and software, but the inclusion criteria were that the study needed to be about the co-design process itself, and about which factors contribute to a good co-design experience.

### **Age**

The criteria included studies involving the adult population and excluded research about children participating in co-design. Children were excluded because they require different types of facilitation compared to adults. Possible research about older people would naturally be included.

### **Geographic location**

Any geographic location was included.

### **Language**

All searches were made in English. The included languages were English and Finnish.

### **Publication date**

The literature search was based on a time-frame from January 1970 to January 2016.

### **Rationale for literature search choices**

This section presents the rationale for the choices made concerning questions around the literature, inclusion and exclusion criteria, databases and keywords. It is important to make aware and informed choices about these four matters, to ensure research quality.

### **Questions for the literature**

The research question of this study is: what are the factors that facilitate or hamper co-design projects? It defines the questions that are presented to the literature. These questions were set to find relevant results and find answers to the research question.

The aim was to find evidence-based research studies about the co-design process and these questions target that.

### **Inclusion and exclusion criteria**

The objectives and the case study of this research define the inclusion and exclusion criteria. These inclusion criteria were seen to be the most suitable, because they were closest to the purpose of the study.

### **Databases**

In the first round, four comprehensive databases were searched: Ebsco host, Taylor & Francis online, Sage journals and Emerald. These databases were identified to be potential sources of co-design papers. The databases were identified with the professional help of a librarian to be most suitable ones.

### **Keywords**

Keywords were identified through scoping searches made before the systematic searches. The keywords were divided into three groups (see table 1.).

<b>Group 1. Keywords</b>	<b>AND</b>	<b>Group 2. Keywords</b>	<b>AND</b>	<b>Group 3. Keywords</b>
co-creation co-design collaborative design design focus group human centred design participatory design public involvement user-centred design user involvement in design		leadership collaboration good practice guidance guidelines management methodology policy quality of engagement user experience		product design or clothing design

Table 1. Keywords for the literature search



The rationale underpinning this was that the Group 1. keywords were chosen to describe co-design activity, the Group 2. keywords to describe good practice in co-design, and the third group of keywords to define that this must happen in the context of product design or clothing design.

### **Data extraction**

The search parameters were set so that the keywords had to appear either in the title, keywords or abstract. The result was: 134 articles found from Ebsco host, 24 articles from Taylor & Francis, two articles from Sage Journals and five from Emerald Insight. These papers were retrieved and reviewed, and it was identified that none of these 165 articles matched the set criteria. They had not researched how to do co-design. As a result, I undertook a further search with parameters that the keywords appeared anywhere in the text, but this did not uncover relevant results.

When tested, they seemed to be appearing everywhere, but the results were not relevant at all. Therefore, it could be inferred that, at least according to this systematic literature search, research into how to do co-design had yet been undertaken, or at least not published.

### **Refining the search, round one**

In an attempt to test the assumptions above, the search was refined with the intention of identifying relevant research. I discarded Group 2. and added new keywords.

‘Inclusive design’ was added to the Group 1. keywords because it describes design that is equally accessible.

The words ‘device’, ‘wearable technology’ and ‘assistive technology’ were added to the Group 3. list to expand the term ‘product design’ and to include specific products.

In addition, a further database, Science Direct, was searched. With this combination of keywords, I got 190 articles from Ebsco host, 109 articles from Taylor & Francis

online, 24 from Sage Journals, 24 from Emerald Insight and 1,609 from Science Direct; altogether, 1,956 articles, but none of them fitted my inclusion criteria.

### **Refining the search, round two**

A final search was undertaken to find articles about collaboration, good practice and guidance in co-design. I combined the Group 1. keywords with Group 2. keywords and left Group 3. out.

With this combination of keywords, I got 4,152 articles from Ebsco host, 1,095 articles from Taylor & Francis online, 222 from Sage Journals, 1,214 from Emerald Insight and 1,666 from Science Direct. This totalled 8,349 articles, but still, according to the abstracts, none fitted my inclusion criteria. This search was not limited to also including a mention of any kind of product or clothing design, which led to the number of relevant articles being so high, but it still did not bring any relevant results.

My aim was to find research papers about good practice in user involvement and collaboration in the co-design process. The specific criteria were that co-design studies should have been made in a real-life situation with users, and also that the designed object should be an artefact, therefore excluding service and software design.

Specifically, I was interested in finding individual studies about how the co-design process should be done. Despite my extensive literature search, I was not able to find a single research paper that would fit my criteria.

### **Section summary**

In conclusion, the systematized literature search did not identify any research papers specifically focused on evidence-based research into good practice in the co-design process. It can be suggested, therefore, that there is a gap in the knowledge regarding this specific topic.

Alternatively, it can be argued that a different search strategy could have been utilised. The research questions, databases or keywords could have been different, but they were chosen according to the best knowledge available.

This literature review chapter presents the literature surrounding the topic, but it is not a 'systematic review'. The aim of this literature review chapter is to understand the background of the research problem. The objective of the systematic literature search was to critically examine the quality peer-reviewed research literature about user involvement and collaboration in the co-design process. Having said that there is no empirical research relating to the good practice of co-design process when designing products, there are still three topics that form the background of this research, and the thematic search brought up papers about older people, public involvement and co-design in general. The literature review will present an interpretation of the published literature related to these topics.

## Part 2. Older people

The primary focus of the DfAW collaborative research was to look at how the attributes of functional clothing and wearable technologies could be introduced, through appropriate design, to improve the everyday lives of older people. Part Two discusses the aspects of ageing that are of particular relevance to the DfAW project, and this thesis. Firstly, an overview of pertinent demographic data will be presented. Following this are discussions on 'Health and wellbeing in later life' and 'Older people as consumers'. Issues specifically related to older people's involvement in design and participation in research will be addressed in the design approaches section.

Design has the potential to solve fundamental environmental and social problems through design thinking and execution (Simmons, 2011). When design looks at the needs of the users, it is often referred to as user-centred design (Fuad-Luke, 2009). The basic principle of user-centred design is either to research the needs of the users the design is aimed at, or to involve them in the design process (Fuad-Luke, 2009).

Cardoso, Keates and Clarkson (2003) considered the design process to be a several stage process, where problem definition is the first stage after the design brief is given. In the first stage, the user group and their needs and wants are investigated (Cardoso et al., 2003). There are a wide variety of design research methods to understand users in order to create more purposeful products, services and systems for them, and also to solve very complex problems (Crouch & Pearce, 2012; Hanington & Martin, 2012). The target user group and the members of the public who participated in the Design for Ageing Well research were older people, aged between 60 and 75 years old. The aim of my research was to look at how to involve especially older people in the co-design process, and therefore this part looks at ageing and the characteristics of older people. I will start the next section with information on demographic change and ageing.

## Demographic change: the ageing population

Demographic change, in particular the ageing population, is a global phenomenon giving rise to range of new challenges (World Health Organization, 2011). It is claimed that the increasing number and proportion of older people in the population constitutes a unique historical period:

*“Never before have older people formed such a large proportion of the total population; never before have physical and mental capabilities remained so high into advanced old age.” (Huppert, 2003, p. 31)*

According to Coni, Davidson and Webster (1992), there is a suggestion that one third of all of the human beings who have ever lived to be older than 60 years old may be alive today. The percentage of older people in the population is increasing all over the world, but especially in developed countries (World Health Organization, 2002). The decline in birth rates is the principal causative factor of the increased proportion of older people in the population in comparison with other age groups (World Health Organization, 2011). The increase in the numbers of older people is also due to decreased mortality earlier in the life course.

There is huge inequality in average life expectancies based on the place where people live (Comission on Social Determinants of Health, 2008; United Nations, 2015). According to the Commission on Social Determinants of Health (2008), life expectancy may differ by more than 35 years due to social determinants, such as the circumstances where people live their lives.

In Europe, this demographic change has been described as ‘The Ageing of Europe’ (Carone & Costello, 2006). By some forecasts, 30% of the EU’s population will be over 60 years old by the year 2020 (World Health Organization, 2002). However, Europe will not age alone. Other countries like the United States, Japan, China and India will age as well (World Health Organization, 2002). According to The United Nations

(2013), the number of people over 60 years old is expected to increase from 841 million in 2013 to 2 billion by 2050.

Whilst population ageing can be depicted in a negative way, Huppert's quote above proposes that today's older people have better physical and mental health. The WHO (2002) stresses the importance of maintaining the health and wellbeing of older people and the need to keep older people socially active and secure. Together, therefore, the continuing trend of population ageing and the need to promote health and wellbeing provided the rationale for the DfAW project.

### **Defining age and ageing: who are older people?**

Defining who 'older people' are is not straightforward and, dependent on source and context, can include people from the age of 50 years onwards. For example, the WHO (2016) suggests that most developed countries use 65 years plus to define an older person, however the United Nations proposes that 60 years plus is a more suitable global definition (World Health Organization, 2016, p. iii). I will use the United Nations standard in my research.

It is of note that, using these definitions, 'old age' can cover over thirty years of a person's life span (Schaie and Willis, 1991). These researchers suggest that people over 65 can be divided into three sub-ages: the 'young old' (65 to 75 or 80), the 'old-old' (75 or 80 to about 90), and the 'very old' (over 90).

'Chronological age' is not the only way to define where a person is in their life span (World Health Organization, 2002). Indeed, Schaie and Willis (1991) claim that 'chronological age' is an index that has very little meaning in itself, and suggest alternative concepts of age, for example biological, social and psychological ageing.

'Biological or physiological age' refers to the anatomy and physiological functioning of the body, and may be considered either higher or lower than the chronological age. Rates of physiological ageing can differ between individuals (Hurley (1991). This can

be due to several factors, including genetic makeup, life style factors, long-term ill health, disability and deprivation. Huppert (2003) draws attention to the differences, noting that active people who continue training into their old age can be in better physiological shape than a 30-year-old. Physiological ageing can be a source of frustration, as people have to come to terms with decreasing physical strength and a decreased ability to respond to physical stressors (Schaie and Willis, 1991).

Schaie and Willis (1991) define 'psychological age' as how a person functions in response to environmental demands. They cite the work of Havighurst in the 1970s, which listed the major developmental tasks to be faced in later life. These include adjustment to change (such as the decrease in strength and health, retirement and reduced income), expecting and surviving the possible death of their spouse, socialising with one's own age group, and living in a pleasant and satisfactory way.

Then, by judging a person's position in the life course against the average, we can determine a person's 'social age' (Schaie and Willis, 1991). 'Social age' is very much culture-related, and set by norms defined by a person's society. 'Social age' is also related to the time when a person lives.

A different conceptualisation of age was proposed by Levinson in 1978, with the life course divided into four eras: 'childhood' and 'adolescence', 'early adulthood', 'middle adulthood' and 'late adulthood' (Schaie & Willis, 1991). A term created by Laslett (1987) divided old age into two stages: the 'Third Age' as a time of activity and engagement, and the 'Fourth Age' as one of increasing frailty and decline.

It is this latter scenario of decline that often dominates, with ageing feared and viewed negatively, however ageing does not always lead to major functional losses and disability (Hurley, 1991). Further, Huppert (2003) contends that much has changed in recent decades: stereotypes of frailty and decline no longer dominate, and older people are healthier and wealthier, as well as fitter and more independent, nowadays. Whilst retirement from paid work may reduce income and contact with co-workers, for many people it is an opportunity to extend their current interests and explore new

possibilities. For example, older people tend to travel more than older people in previous generations and many are active users of information technology (Huppert, 2003).

The discussion above confirms the complexity of ageing, with its dependence on social, structural, individual and biological influences (Bengtson, Gans, Putney, & Silverstein, 1999). Old age can be viewed, perhaps, as a diverse stage of life, when the impact of the ageing process on individuals can differ considerably, and variations in their lifestyles are manifold (Huppert, 2003). Indeed, it should be acknowledged that the variances between persons who are the same age are greater than those between age groups (United Nations, 2015).

An understanding of the differing ways of looking at age, and how this applies to the individual, is an important contextual aspect to my research.

## **Health and wellbeing in later life**

Central to the experience of ageing for individuals is health and wellbeing. The DfAW project had an aim of promoting and maintaining health and wellbeing through encouraging older people to be recreational walkers. This is in part a response to concerns regarding the health and functional capacity of older people (World Health Organization, 2002). A seminal definition of health is that given by the WHO in 1948, and still in common use:

*“Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” (World Health Organization, 2011)*

The Oxford Dictionary defines wellbeing as the “state of being comfortable, healthy or happy”.



Social Services and Well-being (Wales) Act 2014 (2016, p. 5) defines well-being following way:

*“Well-being” in relation to a person, means well-being in relation to any of the following:*

- *physical and mental health and emotional well-being*
- *protection from abuse and neglect*
- *education, training and recreation*
- *domestic, family and personal relationships*
- *contribution made to society*
- *securing rights and entitlements*
- *social and economic well-being*
- *suitability of living accommodation”*

The definition acknowledges two additional point for adults:

- *“control over day to day life*
- *participation in work”*

‘Active ageing’ provides a specific construct for health in later life, and is defined as:

*“Optimising opportunities for health, participation and security in order to enhance quality of life as people age.” (World Health Organization, 2002)*

This can be applied to both individuals and population groups. The goal of active ageing is *“to extend healthy life expectancy and the quality of life for all people as they age”* (World Health Organization, 2010). This means maintaining autonomy and independence while ageing. When people get older, the company of friends, work associates, neighbours and family members remains important, or even becomes more important than it was during a person’s active working life (World Health Organization, 2002). The WHO encourages older people to continue their participation in social, economic, cultural, spiritual and civic affairs. The WHO (2002)

sees the independence of older people and intergenerational solidarity as important factors in successful active ageing, and it also suggests (2010) that older people who are retired, ill, or living with disabilities, can still remain active members in their families, peers, communities and nations, and can contribute their wisdom and time.

However, it has been argued that the construct of active ageing, and the influence of this on health and social care policy, is not wholly positive, particularly the emphasis on physical health and the absence of long term disease. Bowling et al. (2005) point out that that division between 'diseased' and 'normal' people is simplistic, as both groups are very heterogeneous. Holstein and Minkler (2012) suggest that active ageing sets unrealistic standards, leading to negative feelings in some older people. Similarly, alternative terms like 'ageing well' and 'active', 'positive', 'productive' and 'healthy ageing' can equally be seen as oppressive (Timonen, 2016).

### **Quality of life in old age**

When people get older, quality of life has significant importance. Quality of life is a holistic, complex and multidimensional construct (Walker & Mollenkopf, 2007), including "*physical health, psycho-social well-being and functioning, independence, control over life, material circumstances and external environment*" (Bowling, 2007, p. 15).

Studies by Gabriel and Bowling (2004) and Bowling et al. (2005) have contributed to the conceptual understanding of quality of life in older age, particularly from the perspective of older people. Using open-ended surveys and follow-up interviews, a number of factors central to some positive perceptions of quality of life were identified.

Social participation and leisure activities can be seen as an important element in successful ageing (Bowling et al., 2005), with good social relationships with family, friends and neighbours important for almost all respondents (Gabriel and Bowling, 2004). Maslow's hierarchy of needs is criticised for not being multi-level or multi-

domain, as social relationships fill the need of safety and belonging for older people (Gabriel and Bowling, 2004).

Further contributors to quality of life for older people are feelings of safety, security and stability (Gabriel and Bowling, 2004, Reichstadt, Depp, Palinkas, & Jeste, 2007). Perceptions of safety both in the home and in the local neighbourhood were identified; indeed, a good neighbourhood can be seen as social capital, and a source of help in times of need (Gabriel and Bowling, 2004). Financial security is also important for older people (Bowling et al., 2005). Most of Gabriel and Bowling's respondents were modest; they only wished to have enough money to take care of their everyday lives (Gabriel and Bowling, 2004). A sense of purpose and participation is also a factor that contributes to quality of life (Bowling et al., 2005). Participation in social activities was reported as being important in retaining an interest in life and meeting new people.

Gabriel and Bowling's (2004) study also emphasised the contribution of psychological wellbeing to quality of life, in particular the importance of having a 'positive attitude'. This was seen to counter fears of the future, sadness and depression, which have a negative effect on quality of life. Similarly, it has been suggested that a 'positive attitude' enhances the perception of quality of life in people with a physical disability (Reichstadt, Sengupta, Depp, Palinkas, & Jeste, 2010) Another factor in promoting psychological wellbeing was described as 'keeping busy; described as engaging in mentally stimulating activities and including learning new things" (Gabriel and Bowling 2004). This was also supported by Reichstadt et al. (2010) who found that socially engaging in activities is important for older people.

Most people in Gabriel and Bowling's (2004) study reported that being in good health was critical to a good quality of life. It is recognised that not smoking, moderate alcohol use, healthy diet and physical activity have benefits for health and therefore quality of life (Peel, McClure, & Bartlett, 2005; Depp & Jeste, 2006). Good health is a key contributor to physical independence: participants reported that being able to walk and retain mobility enabled them to get outdoors, meet new people and socialise

(Gabriel & Bowling, 2004). By contrast, lacking independence and control over one's life may cause frustration and even depression.

## **Older people as consumers: the 'grey market'**

The demographic change discussed above presents a number of challenges, including market trends and economies (Kotler, Wong, Saunders, & Armstrong, 2005). Moschis (2003) states that demographic change affects everyone, including individuals, institutions and governments. It can be argued that as birth rates decline, older people – 'the grey market' – will become increasingly influential when making key marketing decisions (Kotler et al., 2005). Kotler et al. (2005) agree that these demographic changes will increasingly challenge the minds of politicians and marketers. Additionally, according to Clarkson et al. (2003), older people's financial status means that they have increased spending power.

Until the 1980s, older people were a completely neglected consumer group (Moschis, 2003). An awareness of demographic change has increased recognition around older people's need for, and use of, products, services and environments, requiring manufacturers and service providers to take this section of the market into account Frayling (2003). Clarkson et al. (2003) encourage us to think how products and environments impact on the people who use them:

*"Although the academic and broadsheet worlds still tend to refer to 'the elderly' and 'the disabled', as if they form distinct groups outside the mainstream of society, there is growing trend to recognise age and disability as something we will all experience, and therefore part of a normal life course." (Clarkson et al. 2003, p.1)*

One approach to the dilemma is inclusive design, which will be discussed later in this chapter. Morris (2003, p. viii) describes inclusive design in the following way:

*“When designers make sure that their products and services address the needs of the widest possible audience, irrespective of age or ability, design can be called inclusive design”.*

Several authors (Frayling 2003, Huppert 2003 & Kotler 2005) suggest that there is a huge business opportunity for inclusive design. Huppert (2003) agrees that the growing number of older people creates a need for designers and manufacturers to serve older consumers.

Older people want to participate actively within mainstream society (Clarkson, Coleman, Keates, & Lebbon, 2003). According to Clarkson et al. (2003), older people have increasing spending power. User research methods in design and product development are therefore becoming important (Clarkson et al., 2003).

Moschis (2003) states that older people’s consumer behaviour is influenced by life-changing events, lifestyles and needs, however Huppert (2003) reminds us that there can be significant differences between individuals. Clarkson et al. (2003) give the example of how some older people are more active in exercising and experimenting with new sports, but this is not true for everyone. When designing and developing products for older people, personal, cultural, social and psychological factors, as well as ‘technographics’, need to be considered (Huppert, 2003; Kotler et al., 2005). Technographics refers to consumers’ attitudes, behaviours and motivations towards technology.

However, there are similarities between older people that come from human factors, even though all individuals are different. Although older people are a heterogeneous group, Moschis (2003) has listed six attributes that are generally applicable for older consumers. These six characteristics for products or services are: convenience, functionality, quality, dependability, a personalised service and product development. User research methods in design and product development are becoming increasingly important, including the participation of older people (Clarkson et al., 2003). Fisk et al. (2009) contend that older people’s demands for products and services varies,

reporting that age does not in all cases limit the number of products that are used, but the importance of usability becomes more essential in improving the lives of older adults.

## **Section summary**

This section identified the factors in ageing that are relevant to this thesis. Population ageing is a global phenomenon, and across the world, healthy ageing policies and programmes have been aimed at enhancing and maintaining all aspects of health and wellbeing in later life to improve quality of life and reduce the costs of health and social care. One aspect of promoting health in later life is participation in exercise, including walking, which provided the impetus for the DfAW project. Older people might be encouraged to walk more if appropriate clothing, equipment and supportive technology was available, and therefore the older consumer has been discussed. Clothing and technology might be appropriate and usable if greater numbers of older people were involved in co-design. Age has been identified as a complex construct, with a heterogeneity that needs to be recognised in the design process and the involvement of older people, which can include physical, psychological and social changes impacting on individuals and communities. The next section discusses public involvement, which is also relevant background for this study.

## **Part 3. Public involvement**

Involving members of the public is a common approach both within and outside the design discipline. Part 3. introduces the concept of public participation, and discusses how public involvement recommendations and guidelines may benefit co-design.

The first section presents public involvement generally, as well as the different mechanisms for involving members of the public with a wide variety of tasks. A presentation of the different terms for, and descriptions of, public involvement can be found in the first section, followed by a description of public involvement in different fields in more detail. A short history of public involvement in diverse areas of life is presented last. The second section focuses on knowledge about public involvement in research, particularly related to health and social care research. The health and social care field is a frontrunner in public involvement in the UK and there is an extensive amount of research about how to involve members of the public in research. In the third section, the evidence-based benefits and challenges of public involvement are presented. The final section includes an evaluation of public involvement.

### **Definition of the terms**

Public participation is based on the idea that, in addition to voting, people also have the right to be involved in decision-making on issues that affect them (Burton, 2009; Dougherty & Easton, 2011). The public can be involved in different types of project, for example public administration, research, and service improvement (Dougherty & Easton, 2011; Michels, 2012, Savory, 2015). Topics can be diverse, from education, crime prevention, mass transportation or environmental planning, to waste management (Leighninger, 2009).

A variety of words and phrases can be used to denote involving members of the public. For example, Leighninger (2009) identifies a range of terms used for public

participation in governmental decision-making, including 'active citizenship', 'citizen-centred work', 'citizen involvement', 'citizen participation', 'collaborative governance', 'deliberation', 'deliberative democracy', 'democratic governance', 'public dialogue', 'public deliberation' and 'public engagement'. However, the differences between the terms is unclear, and there are no clear directions on how and on which occasions to use a specific term. There are two kinds of language challenge with terminology: synonyms meaning 'the same concept, different terminology' and homonyms meaning 'the same word, different meanings'.

The easiest approach may be to think of the first word group as something that describes *people*, and the second word group as something that describes *involvement*. Synonyms for '*people*' include 'consumer', 'citizen', 'community', 'customer', 'public', 'service user' and 'user', depending on their function in a specific case. The word referring to people can also indicate the characteristics of the people being referred to. For example, 'community' refers to a local aspect, and 'user' to somebody using a service or a product.

Synonyms for '*involvement*' include words such as 'collaboration', 'engagement', 'involvement' and 'participation', and refer to some kind of co-operation between 'professionals', who are doing the task as a part of their job, and members of the public. Terms such as 'consultation', 'emancipation', 'empowerment' and 'partnership' can be used to describe co-operation. When terms for '*people*' and '*involvement*' are combined, they give a wide range of variations.

Further, the terminology for public participation differs across the world (IAP2, 2009). 'Citizen engagement' is the used term in Canada, 'civic engagement' in the United States, 'citizen participation' in Mexico, 'public management' in Brazil, 'partnership' in Scotland, 'public consultation' in Australia and 'community voices' in New Zealand (IAP2, 2009). Leighninger (2009) proposes that the reason for the confusing and overlapping terminology is that public participation has developed simultaneously in completely different fields and in different countries.



The International Association for Public Participation published core values for the practice of public participation in 2007 (International Association for Public Participation). These values were formulated to guide actors towards better public involvement:

- *“Public participation is based on the belief that those who are affected by a decision have a right to be involved in the decision-making process.*
- *Public participation includes the promise that the public's contribution will influence the decision.*
- *Public participation promotes sustainable decisions by recognising and communicating the needs and interests of all participants, including decision makers.*
- *Public participation seeks out and facilitates the involvement of those potentially affected by or interested in a decision.*
- *Public participation seeks input from participants in designing how they participate.*
- *Public participation provides participants with the information they need to participate in a meaningful way.*
- *Public participation communicates to participants how their input affected the decision” (IAP2, 2007a).*

According to the International Association for Public Participation, there is a spectrum for the activities of public participation that have different levels of public impact (IAP2, 2007b). Informing has the lightest level of impact. The purpose of informing is to offer correct and balanced information to help the public understand the issue, the alternatives and the solutions (IAP2, 2007b). Techniques for informing people include delivering factsheets, publishing information on websites and having ‘open houses’ to provide information (IAP2, 2007b). Rowe and Frewer (2002) argue that the impact of public hearings is moderate.

Community engagement traditionally uses the same tools as public participation in governmental decision-making, such as opinion surveys, meetings and public hearings. Hodgson (2011) proposes that innovative and creative tools, such as art and culture, can increase stakeholder involvement. She names visual art techniques, storytelling, social networking, exhibitions, music performances and festivals as examples of new ways to achieve community engagement (Hodgson, 2011). There are different types of community engagement organisations involved in supporting community engagement efforts, for example 360Communities (360Communities) or platforms for discussion, for example the World Café (The World Café, 2017). The subjects can be anything from health and social care, crime prevention, mass transportation, environmental planning or urban planning, to waste management.

Croft and Beresford (1992) proposed that a movement happened in the 1980s, when a new user-centred approach and terminology was launched. This also led to services for minorities, such as gay and lesbian communities and ethnic minorities, who were previously ignored (Croft & Beresford, 1992). Service user involvement is based on the idea that those who use services have valuable insight on how those services work, and how services could be improved for users. Like all sorts of participation, it is based on the principle that people have the right to express their opinion about things that affect their everyday lives.

The next form of participation is to consult the public to support decision-making (IAP2, 2007b). This can be done through organising open or focus group meetings, and through carrying out surveys (IAP2, 2007b).

According to the International Association for Public Participation, the next level in hierarchy is 'involving', which in this context means taking the public into account throughout the process to make sure that the concerns and opinions of the public are understood (IAP2, 2007b). Collaboration is considered an even more intense process, in which the public is strongly involved in developing alternatives and preferred solutions (IAP2, 2007b). 'Empowering' gives the most power to the public, so they can participate in making the final decision (IAP2, 2007b).

## **Public involvement in health and social care research**

This section concentrates on public involvement in health and social care research in the UK, as there is a body of work on improving public involvement. This knowledge can provide additional value in good practice for user engagement in co-design. One of the key players in the field is INVOLVE, which is a national advisory group that is unique in the world. INVOLVE was founded by The National Institute for Health Research in 1996 to promote public involvement in health and social care research. It has created a number of guides to support ethical public involvement (INVOLVE, 2016). Another key player in the UK is the Involving People Network in Wales, which brings members of the public and researchers together to do research. Involving People Network operates in the health and social care field (Involving People Network, 2017).

INVOLVE (2012) has defined the terms 'public involvement', 'public engagement' and 'public participation' in a specific way in order to separate the different activities. Public involvement in research means that members of the public collaborate with professional researchers and are actively involved in one or more aspects of the research process (INVOLVE, 2012; Smith et al., 2006). The key point of the term 'public involvement' is that the members of the public undertake research together with the researchers, instead of being subjects of the research (Staley, 2009), whereas public participation implies that the members of the public take part in the research and are researched themselves, either by participating in a clinical trial, filling in a questionnaire or participating in a focus group (INVOLVE, 2012). Public engagement (INVOLVE, 2012) means informing the public about research findings.

### **Levels of involvement**

This section concentrates on the different points of view on public involvement in research projects, because these same principles can be useful in design research and co-design projects in general. According to Staley (2009), there is evidence that public involvement has benefits at different phases of a research project. In addition to

participating in the different stages, the public can take part at different commitment levels, from consultation to collaboration and user-control (Staley, 2009). The chosen level of involvement may vary depending on the project, available tasks, skills, time and expertise involved (Cooley & Lawrence, 2006). The simplest level of involvement is just to inform the public (Cooley & Lawrence, 2006). Consultation means asking the public's opinion about a certain topic, in order to inform decisions, and this can take place at any stage of the research project (Buckland et al., 2007b). Collaboration means a deeper, continuing relationship with the public, when the public are involved at different stages of the research process, for example by belonging to an advisory group (Buckland et al., 2007b). User-controlled research signifies that members of the public carry out the research themselves, which they have proposed and designed with the help of professional researchers (Buckland et al., 2007b).

### **Phases of a research project and activities for members of the public**

There are a number of ways in which people can become involved in the different stages of a research project: at the definition, planning, execution, evaluation and closing phase. A common role is advisory group membership, where a member of the public participates in an advisory group, and can be involved in the whole research process (Buckland et al., 2007a). According to Staley (2009), involving the public has made an impact on designing projects, improving research tools, recruitment, data collection, data analysis, writing up project reports and the dissemination of the research. Users can be involved in one specific stage and influence several research projects, or they can be involved with one specific research project and all the stages of it, although INVOLVE recommends that user involvement is more effective if users participate through the project (INVOLVE, 2012). Members of the public can take part in educating other people according to the research results (National Institute for Health Research, 2013). The following sections provide a detailed description of the contribution possibilities of the public at each stage, and also consider what needs to be taken into account in each stage of the project.

### **Definition and planning phase**

Writing the research proposal and applying for funding for the research belongs to the initial phase of work. According to Staley (2009), public involvement has in the past made an impact in defining the research topic, the research questions and the project design, and it has helped researchers to get funding by adding credibility and establishing feasibility. Users have also been helpful in testing and improving research tools and methods, which has added reliability to the studies (Staley, 2009). If the research secures funding, the actual research process can start after receiving the ethics approval. The first stage also includes background activities, such as a group of members getting know each other and agreeing on working methods (Department of Health, 2006). It is also considered good practice to provide training for members of the public about research and user involvement, and to tell them about supporting opportunities (Department of Health, 2006). The tasks that the public can do in these stages differ in their nature. One task they can be involved in is commenting on or contributing to written documents, which can include research proposals, literature reviews, and information leaflets, or designing research questionnaires (Staley, 2009).

There are two aspects that need to be considered in the planning phase. Firstly, all practical decisions need to be finalised, such as time, date, duration, place, seating, catering, breaks, expenses, acoustics and audio-visual solutions (National Institute for Health Research, 2013). Secondly, members of the public need to be informed about their commitment and how the process works (National Institute for Health Research, 2013). All communication, including cover letters as well as information sheets and role descriptions sent to possible advisors, should be accessible and written in plain language (National Institute for Health Research, 2013).

There are several factors that need to be acknowledged in setting up a User Advisory Group. Warburton et al. (2009) highlight that clear communication between researchers and stakeholders is crucial and the research process needs to be explained in a way that everybody can understand. It is important that the project and methods, as well as the appropriate terminology, should be explained thoroughly, and

researchers should ensure that everybody is aware of them (INVOLVE, 2012). Furthermore, researchers need to avoid giving false expectations to users (INVOLVE, 2012).

To carry out successful research in co-operation with different stakeholders, there needs to be a common goal that is understood by everybody (INVOLVE, 2012). The stakeholders must be willing to understand each other's opinions, values, aims and talents (Warburton et al., 2009).

### **Execution phase**

Carrying out research includes phases of data collection and then analysing the collected data. Members of the public may undertake data collection, for example interviewing participants, or running focus groups (Smith et al., 2006) or, in the extreme, undertaking research projects (Staley, 2009).

It should be noted that members of the public (as well as researchers) can get overwhelmed by and stressed about the study (Staley, 2009). A research project that plans to involve members of the public should also plan how to react if the project gets too difficult or stressful for the stakeholders. Execution phase guidelines also include safety issues. The security of researchers should also be maintained when there are members of the public involved.

### **Dissemination**

In the final stage, the research project is evaluated and disseminated. Dissemination involves the sharing of study findings and can include publication in scientific journals, books and conference presentations (INVOLVE, 2012).

### **Closing phase**

The National Institute for Health Research (2013) warns that members of the public may experience a sense of emptiness or loneliness when the project ends. Involvement can become very important in people's lives, with the provision of meaningful activity and social contacts. Organisers should recognise the potential

dangers and plan for a helpful and supportive end to involvement in the project, for example possibly by directing the members of the public to other projects (National Institute for Health Research, 2013).

### **Guides and guidelines for public involvement in research**

Guides and guidelines can be targeted to several audiences, for example, members of the public, researchers or committee members. Guides done for members of public generally explain the nature of research and what is required from the participants, alongside their responsibilities and rights. Guides done for the party that is hiring lay people generally concentrate on how to treat lay people correctly and equally, and explain the procedures needed; for example, payment. A good example of this is INVOLVE's series of seven guidelines: three for people who are thinking of getting involved in research, three for commissioners and one for researchers. These guidelines are very practical in explaining the different tasks from the different perspectives of the different target audiences.

In considering the guidelines for involvement that are already in existence, several guides and guidelines located within the health and social care discipline can be used to inform my study. For example, INVOLVE has published a Public Information Pack in easy-to-understand language for members of the public who would like to take part in National Health Service (NHS), public health or social care research, or who are considering it (Buckland et al., 2007b). Guides and guidelines can be targeted to several audiences, for example, members of the public, researchers or research committee members. Some guides have been developed for members of public specifically to explain the nature of research and what is required from the public, and their responsibilities and rights. Guides developed for commissioners concentrate on treating the lay participants correctly and equally and explaining the procedures needed, such as payment. These kinds of packages are very useful, as there are lots of members of the public who have no experience of research. It is very important to explain to them what the research process includes and how they can make a difference.

Staley (2009) reminds us that before the first lay person becomes involved, the researchers must understand why they want to involve the public. The researchers also need to know who it is appropriate to involve and how best to involve them. There are a wide variety of issues that researchers should be aware of when involving lay people in research. Those guidelines vary from very practical issues such as suitable lunch options to the potential for a sense of mental emptiness after the research is finished, as discussed above. There is a wide range of guidelines for public involvement in research in the health and social care disciplines (Warburton et al., 2009). Warburton, Bartlett, Carroll & Kendig (2009) conducted a study in 2006 and 2007 about establishing “a guiding framework for both researchers and community organisations seeking to involve older people in research”. Their aim was to make their guidelines meet the needs of all stakeholders involved, and their families and carers (Warburton et al., 2009).

## **Ethical considerations within different stages of the research**

Guidelines can be divided into different phases of the research, as well as common guidelines that should be followed during the whole study. According to Warburton et al. (2009), research should be acknowledged as:

*“a process with different stages and levels of involvement. Older people and their organizations can provide input throughout the different stages of research, from developing priorities and research questions, to discussions about the methodology and approach, the interpretation of findings and the promotion of research outcomes.”*

Research teams need to discuss in advance what kind of information they need from their User Advisory Group, because without proper agreement beforehand, expectations are harder to meet. The Workshop of the Ageing Well Network has formed principles for researching older people (Warburton et al., 2009). These include maintaining a sense of integrity in communications between researchers and the



ageing community, as groups should receive trustworthy information about how long the project lasts so they can consider their rationale for involvement.

Williamson (2006) has listed nine ethical concerns when people participate in research, which can be described as the *'rights'* of individual participants. The *'right to be informed'* means that participants need to fully understand what they are committing to. The *'right to withdraw'* means that, at any phase of the research, members of the public can end their participation without giving an explanation. The third right is a *'right not to be harmed'*; not only does this mean ensuring the safety and welfare of participants, but also, as Williamson (2006) states, it is researcher's responsibility to withdraw a participant if their best interests are in danger. Fourthly, Williamson (2006) identifies the *'right to be researched'*, meaning that people who have often been excluded from research as they may have been considered 'hard to reach' or problematic to include, should be enabled to participate. People have the *'right not to be over-researched'*, which can be exhausting. The sixth right is the *'right to payment'*, which is presented in the next section in more detail. The *'rights of ownership'* means the rights to their own data. The eighth right is the *'right to confidentiality and anonymity'*. The last rights are the *'rights of the researcher'*, and Williamson (2006) states the researcher has a right to withdraw in situations of stress or danger. It is the norm to have a plan in the ethical approval form detailing how to act in situations of risk (Williamson, 2006).

### **Payment for involvement in research**

In 2010, INVOLVE published a new guide about payment for involvement that is meant primarily for researchers and research managers. Two previous guides were published in 2002 and 2006. The guide (INVOLVE 2010) clarifies the benefits in paying for involvement, stating that the value of time, skills, and expertise of all those involved in research should be acknowledged and paid for. Further, payment to members of the public demonstrates to them the value of their contribution to the quality of the study. Paying everybody in the group the same amount also supports equity, and

highlights to the public that their time is as valuable as that of everybody else (INVOLVE, 2010).

Not only is paying for expenses good practice, but it may be essential for lay people's commitment to the research (INVOLVE, 2010). For example, without receiving travel expenses or money for replacement care costs, people may not be able to contribute, and indeed may contribute to the exclusion of some groups.

As stated previously, everybody should also have the right to withdraw their offer, but researchers should make sure that this is not done for the wrong reasons. For example, people may be concerned that the payment may affect their pensions, taxes or state benefits (INVOLVE, 2010). It is therefore good practice for people who are considering involvement in a project to be given a written plain-language policy paper, detailing the payment processes and who to contact if there is a problem (INVOLVE, 2010).

A very important issue is also the provision of a job description (INVOLVE, 2010). It is important that the members of public understand what is required of them to get the payment, and how long they are going to be engaged.

### **Benefits of user involvement**

Staley (2009) identifies a number of benefits to public involvement in research including the production of more significant research that more effectively addresses issues that are important to people. Furthermore, it is suggested that public involvement can enhance the credibility of the research. An Advisory Group can help to ensure that research methods are suitable for the specific participant group that the study is designed for; for example, it may be the case that potential participants have some characteristics that might limit participation (such as restricted mobility or the need for medication), and an Advisory Group can help to devise enabling strategies. Members of the public can also be good recruiters, because they can recruit their peers to participate in the project (Staley 2009).

Warburton et al. (2009) also highlight how the people who get involved in research can experience benefits, such as gaining new skills and developing confidence, as well as having new experiences and opportunities. Staley (2009) further suggests that the wellbeing of the public can be improved by research which acknowledges users' needs.

### **Challenges of public involvement**

There are also challenges in public involvement. Public involvement in research may improve the relevance and appropriateness of the research. Sometimes there are problems with measuring if the outcomes of user involvement in research are relevant and appropriate. Working in an equal partnership may cause challenges, and being involved may be tiring (Staley, 2009). The participant can have unrealistic expectations or their expectations can differ from those of others. People can also be disappointed when the project ends and feel that they are losing social contacts that have become important to them (National Institute for Health Research, 2013). A downside of public involvement might be that the decision-making process or research is delayed, because involving the public takes time and resources (Staley, 2009).

## Part 4. Design approaches

This thesis investigates user involvement and collaboration in a co-design project. There are many design approaches that involve the end users, with a consequent plethora of descriptive terms. This thesis intends to consider three major approaches identified as: user-centred design, inclusive design and co-design, providing discussion of each definition, similarities and differences. The quality of engagement and guidelines for co-design are presented in the fourth section. Part 4. finishes with a presentation of multidisciplinary collaboration, including shared language. Specific points relating to the inclusion of older people in design are integrated into the discussion.

Reviewing the literature on approaches to design that are focused or include the end-user has revealed a significant number of descriptive terms, with degrees of similarity and difference that can be difficult to discern. This lack of conceptual clarity makes it challenging to compare these design approaches.

The following table (see table 2.) describes these main design approaches, and their synonyms, discussed in this section. Participatory design is an older term than co-design and is often used interchangeably. Co-design differs from inclusive and user-centred design by involving users. These terms are synonyms, with similar meanings, and they are placed underneath the main term in the table. The slight differences in user involvement are discussed in more detail in the text.

<b>user-centred design</b> human centred design consumer centred design customer centred design user oriented design emotional design	Design that focuses on the needs of the users. This does not necessarily include direct involvement with users.
<b>inclusive design</b> universal design design for all design for accessibility barrier free design	The design of mainstream products and/or services that are accessible to, and usable by, as many people as reasonably possible without the need for special adaptation or specialised design (Inclusive design, Designing Buildings Wiki 2016). This does not necessarily include direct involvement with users.
<b>co-design</b> collaborative design co-creation	Designing together. Co-designers are professional designers, other professionals, amateurs and citizens who identify problems, needs and challenges, develop a design brief and then design the solution or outcome together (Fuad-Luke et al., 2015, pp. 24–26).
<b>participatory design</b> sometimes synonymous to co-design	An approach to design attempting to actively involve all stakeholders in the design process to help ensure the results meet their needs and are usable. It was first recognised as a design approach in the 1960s in Scandinavia to help with the transition to more automated work practices in factories, but has evolved over the years to bring in the expertise of professionals, users, customers and, more recently, citizens, to share their experiences and generate more efficient and meaningful solutions. PD crosses with other participatory design approaches and methods including user-centred design, co-design and open design (Fuad-Luke et al., 2015, pp. 31–34).

Table 2. Design approach terms

## User-centred design

User-centred design considers users' needs and wants in all the design and development stages of the product. This section includes the definition of terms, the strengths of user-centred design and a short history of user-centred design.

'User-centred design', 'human centred design' and 'customer centred design' are often used interchangeably (Miaskiewicz & Kozar, 2011). Kujala (2002) states that successful product development requires an understanding of customer needs, which is important particularly when beginning the product development process. 'User-

centred design' (UCD) attempts to learn from targeted users about their needs, wants, emotions and values, because understanding the user experience is seen as central in creating fit for purpose design (Nurkka, Kujala, & Kempainen, 2009; van Rijn, Sleeswijk Visser, Stappers, & Özakar, 2011). Willis (2004) describes how user-centred design can be described as 'socially responsible', because it prioritises user experience over product form or appearance. Steen (2011) prefers the term 'human centred design' because, according to him, 'user' is too limiting a term.

User-centred design (UCD) is a design philosophy where designers concentrate on gaining an understanding of the users of the end product (Pratt & Nunes, 2012). Pratt and Nunes (2012) present a theory where factors of the user-centred design process need to be balanced. According to their model (see figure 4.), the left and right sides need to be in balance. Budgets and timelines need to be in balance with client expectations and goals. Similarly, user needs and wants should be in balance with technology requirements and restrictions. Although Pratt and Nunes (2012) acknowledge that balancing these different factors can be challenging, they suggest this is necessary for successful commercial product development.

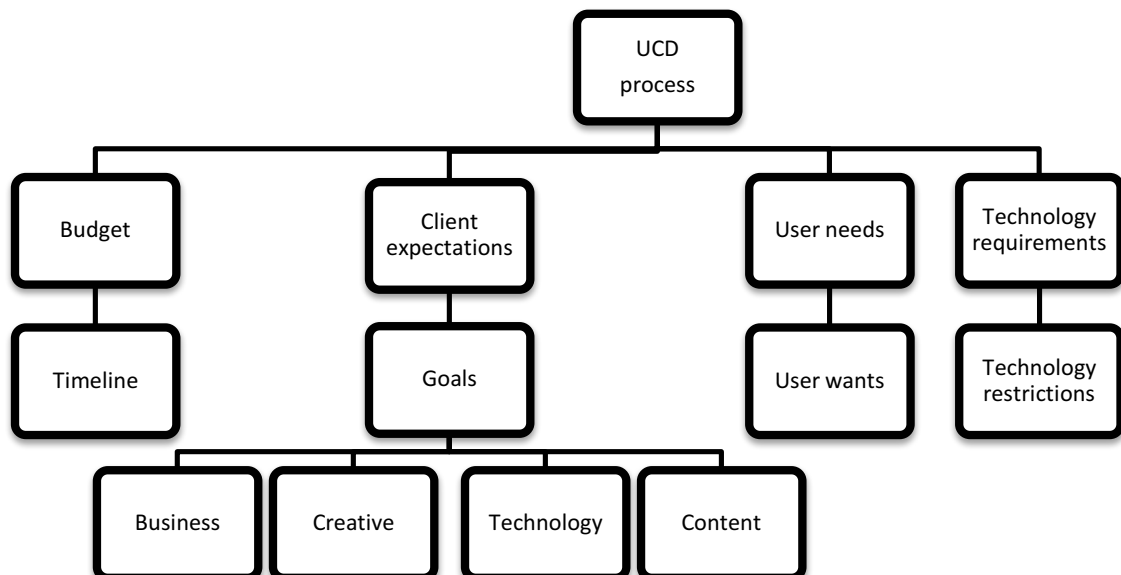


Figure 4. *Different factors in the user-centred design process*

Veryzer and Borja de Mozota (2005) also use the term 'user oriented design' (UOD). They (2011) describe how, in 'human centred design', better products and services are designed by learning from the users. Steen (2011) explores how 'participatory design', 'ethnography', 'lead user approach', 'contextual design', 'co-design' and 'empathic design' are all different human centred design approaches. Additionally, Marshall et al. (2015) suggest that 'inclusive design' is also one of the user-centred design disciplines.

The idea of 'empathic design' is to design with an understanding of, and empathy with, users (Kouprie & Visser, 2009). In order to meet user needs, designer have to know in great detail who the user is, how the product is used and in what circumstances (van der Bijl-Brouwer & van der Voort, 2014). According to Batterbee and Koskinen (2005), 'empathic design' is a term that has been in use since the late 1990s. Leonard and Rayport (1997) write that many companies have not developed the skills to carry out empathic design, but they recommend that they should do so. They claim that it is a relatively cheap and risk-free way to discover critical user needs (Leonard & Rayport, 1997). However, Marshall et al. (2015) claim that involving users in the design process is not always easy, either because of a lack of resources such as time and money, or because of logistical reasons.

The idea of user-centred design is to cooperate with users in order to find out their preferences, but the level of involvement differs (Kujala, 2003). As a solution to understand users, Marshall et al. (2015) propose the use of personas, which are descriptions of typical users containing a name, a photo and demographic information, collected from user research. According to Marshall et al. (2015), the term 'persona' was introduced by Alan Cooper in 1999. Miaskiewicz (2011) suggests that the use of personas has several advantages, such as assisting in design team collaboration and communication and helping to understand specific target groups, as well as significantly improving design.

## Short history of user-centred design

User-centred design is not a new phenomenon. It is suggested that the history of user-centred design starts from the 1940s and 1950s, rooted in the work of Henry Dreyfuss (Rothstein & Shirey, 2002). Henry Dreyfuss wrote his book *'Designing for people'*, considered the classic text of industrial design, over half a century ago, in 1955. Dreyfuss (2003) states that designers are responsible for a successful usability experience; otherwise, the designer has failed. In 1959, Dreyfuss also published *'The Measure of Man'* which is generally seen as the beginning for human centred design.

Ten years later, in 1970, Victor Papanek published his *'Design for the real world: Human Ecology and Social Change'*, which was one of the first books to discuss the environmental sustainability of design (Papanek, 1970). Clarkson et al. (2003) claim that Papanek was one of the first people to highlight the importance of social issues in the design world. His book led to a world conference called *'Design for Need'* in London, in 1976, where Papanek and his colleagues explored the social features of design and developed the idea of *'designing out disability'*, which influenced the way design is thought about (Bicknell & McQuiston, 1977).

In 1986 Donald Norman and Stephen Draper published *'User-Centered System Design: New Perspectives on Human Computer Interaction'*, focusing on the interaction between humans and computers. Norman developed his concept of user-centred design, and published the bestseller *'The Psychology of Everyday things'*, republished in 2002 as *'Design of everyday things'* (Norman, 2013). Norman (2013) claims that objects we use every day can be confusing, irritating and frustrating as a result of poor design. It is suggested that the solution is human centred design, and Norman (2013) suggests that human needs, capabilities and behaviours need to be understood in order to create practical and functioning design. Norman has published over a dozen books in the field of design, but one book particularly worth mentioning is *'Emotional design'*, which was published in 2004. In this book, Norman (2004) claims that emotional design and the desirability of a product are a combination of usability, aesthetics and interaction with the product.



## Inclusive design

Inclusive design acknowledges the widest possible range of users. This section is divided into three subsections: definition of terms, design exclusion and trans-generational design.

Kahmann (2000) brings up how inclusive design is sometimes referred to as design for the elderly or for older people, and reminds readers that older people are a very heterogeneous group. Inclusive design requires that design should be accessible for all, irrespective of age or ability, but Kahmann (2000) argues that in practice this is impossible. Therefore, he recommends conscious exclusion.

'Inclusive design', 'universal design' and 'design for all' are terms that are used interchangeably (Clarkson et al., 2003; Ostroff, 2001). The term 'inclusive design' is mostly used in Europe, whereas 'universal design' is used in the US and Japan (Frayling, 2003; Ostroff, 2001). Fuad-Luke (2009) explains how not only are the terms 'inclusive design', 'universal design' and 'design for all' synonymous with each other, but moreover so are the terms 'design for accessibility', 'trans-generational design' and 'barrier free design'. Ron Mace was one of the pioneers of 'universal design' and he introduced the term in 1985 (Ostroff, 2001). According to the Center of Universal Design (2008), Mace defined the concept as follows:

*“Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.”*

Mace's idea was that mainstream design would meet everybody's needs and be usable by everybody, regardless of their age or abilities (Clarkson et al., 2003; Ostroff, 2001).

Keates and Clarkson (2004) argue that 'design for all' was an early concept when inclusive design was created, and it is often misunderstood. The idea was not to design 'one product for all', but to encourage designers to consider a wider range of users (Keates & Clarkson, 2004). Therefore, the approach would be to design for 'the largest possible population' instead of 'the entire population', because there are always users who cannot use the product for one reason or another (Keates & Clarkson, 2004). A newer method is to develop a design approach for more specific groups, such as 'trans-generational design', which aims to consider all age groups when making design decisions (Keates & Clarkson, 2004).

The principles of universal design were drafted by a multidisciplinary group led by Ron Mace in 1997 (Centre for Excellence in Universal Design, 2016; The Center for Universal Design, 1997):

- *“Equitable use*
  - *the design is useful and marketable to people with diverse abilities.*
- *Flexibility in use*
  - *the design accommodates a wide range of individual preferences and abilities.*
- *Simple and intuitive to use*
  - *the use of the design is easy to understand, regardless of the user’s experience, knowledge, language skill or current concentration level.*
- *Perceptible information*
  - *the design communicates necessary information effectively to the user, regardless of ambient conditions or the user’s sensory abilities.*
- *Tolerance for error*
  - *the design minimises hazards and the adverse consequences of accidental or unintended actions.*
- *Low physical effort*
  - *the design can be used efficiently and effectively with a minimum of fatigue.”*

These principles are widely acknowledged, but Mustaquim (2015) claims that the principles often fail to create accessible design, because the results of universal design principles are not evaluated in any standard way. This means that products are not evaluated against any agreed standard, i.e. ISO standards.

Waller et al. (2010) challenge the thinking that assistive technology is just for disabled people and mainstream products merely for 'fully able' users. Keates and Clarkson (2004) propose that there are two different approaches to inclusive design, a top-down approach and a bottom-up approach. A top-down approach means that products are designed for the least functionally capable people, and then extended towards the wider population (Keates & Clarkson, 2004). A bottom-up approach tries to extend the usability of a mainstream product to a wider user group, making the product more usable (Keates & Clarkson, 2004). Waller et al. (2010) remind that capability variation is remarkable, and affects different abilities. However, Keates and Clarkson (2004) argue that neither of these approaches will lead to product development for all, and in the worst case scenario, the product will end up as a bad compromise, satisfying neither the needs of the mainstream market nor those of a more specific group.

### **Design exclusion**

Waller et al. (2015) point out that every decision made about design can cause user inclusion or exclusion. Vision, hearing, thinking, reach, dexterity and mobility are capabilities that affect user experience and their potential ability to use products (Waller et al., 2015). Everybody has capability variation, and ageing is known to increase variation between individuals (Elton & Nicolle, 2010; Waller et al., 2015). According to Elton and Nicolle (2010), motor, sensory and cognitive capabilities start to decline notably after the age of 65, but they are also affected by environmental factors, such as lighting, background noise and temperature. Another often excluded group is people with a disability, but the reasons why a product is not usable can be very different within this group (Waller et al., 2015). Coleman and Myerson (2001) make the point that understanding the reasons for design exclusion helps to design

more inclusively. The idea of countering design exclusion is to design inclusively, in order to improve products and make them appealing for all users (Clarkson & Coleman, 2013). Design exclusion can also vary, from slight frustration to complete exclusion (Clarkson, Waller, & Cardoso, 2015).

In addition, inclusive design can improve business, because a wider audience can use the products (Clarkson & Coleman, 2013; Waller et al., 2010). However, Waller et al. (2015) state that it is not worthwhile to try to design a product for the whole population, but instead to acknowledge different customer segments. Waller et al. (2015) recommend studying the needs of each target group, and the level of difficulty they can handle. The following section discusses the design aspects specifically related to age.

### **Trans-generational design**

As discussed earlier, the ageing population is acknowledged to be a big business opportunity, and trans-generational design is a market-led approach to cater to the needs of older people and to grow business (Clarkson & Coleman, 2013; Coleman, 2016). Fuad-Luke (2009) points out that because of the increasing number of older people in society, it is crucially important that they are acknowledged when designing products, services and public places. Ignoring the older population in design does not only cause problems for older people (Fuad-Luke, 2009); it is also a missed business opportunity for companies (Wilkinson & De Angeli, 2014).

The term trans-generational design was created by the industrial designer James PirkI in the mid-1980s:

*“The practice of making products and environments compatible with those physical and sensory impairments associated with human ageing and which limit major activities of daily living.”* (PirkI, 1994, p. 25)

Pirkl developed the trans-generational design concept with his Syracuse University colleagues in the 1980s, and published the guidelines in 1988 together with Anna Babic in '*Guidelines and Strategies for Designing Trans-generational Products*' (Pirkl, 1988, 1991, 1995). Pirkl won the Gold Industrial Design Excellence Award for his 1994 book '*Trans-generational Design: Product for an Ageing Population*', which gained attention for the concept of trans-generational design.

The aim of trans-generational design is to create products that are usable by any age group (Langdon, Johnson, Huppert, & Clarkson, 2015). According to Story (1998), the term trans-generational design overlaps with universal design. However, trans-generational design is a narrower concept, since it concentrates on age-related disabilities, and does not take into account other capability differences caused by, for example, accidents, illness, cultural background, gender or literacy level (Story, 1998).

A key principle of trans-generational design is to avoid stigmatisation, because older people may refuse to use products that look like assistive technology for the elderly (Story, 1998). Fisk et al. (2009) make the point that when usability is improved for older adults, it is normally improved for younger people too. Fisk et al. (2009) also recommend that if older people are the target users for the design, they should be included in the design process at an early phase, and recruited for a test group.

Reading Clarkson et al. (2003), reminds us of the danger of compromises. They state that if the product is designed too specifically for one user group, the wider user group's requirements could be compromised (2003).

## **Co-design**

Co-design was the methodology used in the DfAW project. A co-design approach enables users to participate in the design process. This section is divided into three subsections: characteristics of co-design, short history of co-design, barriers to co-design and co-design methods.

## **Characteristics of co-design**

The key characteristic of co-design, that distinguishes it from UCD and inclusive design, is involving end-users in the design process, and designing with them in order to satisfy their needs (Sanders, 1999). In many cases, products are so complicated that companies need external know-how, and use subcontractors at some point in the design or production process (Buur et al., 2013). The goal of participatory design is to engage all stakeholders, such as designers, clients, users and the community, in every phase of the design process, but in contrast to user-centred design approaches users can simply be objects for observation, or users can alternatively just answer questions, deliver information or comment on designs (Kang, Choo, & Watters, 2015; Kujala, 2003). This is supported by Koskinen et al. (2012), when they suggest that the depth of the user's role varies from observation to participation and immersion.

According to Buur et al. (2013), companies are also increasingly dependent on their value chain and value network, i.e., all stakeholders, such as producers, sellers, distributors, buyers and public organisations. Increasingly, all of these stakeholders, including users, are engaged in the design process, but this situation is not completely challenge-free (Buur et al., 2013; Sanders, 1999). Sanders (2002) describes participatory design as a mind-set, with the belief that everybody can be creative if they are given the right tools. Mattelmäki (2008) argues that it is not that straightforward, because participating in a design process requires a creative atmosphere, knowledge, a change-oriented mind-set and envisioning skills, which might be challenging for some stakeholders, including members of the public.

Secondly, involving end users and other stakeholders from outside the company requires changes in the design process and moderation in the design tools and techniques, for example the use of different co-design methods (Mattelmäki, 2005; Sanders, 1999; Wilson et al., 2015). Thirdly, producing a commonly agreed result from all of the stakeholders' views is challenging (Mattelmäki, 2008), because there is rarely consensus between users' opinions.

Recent years have seen a discernible shift in the designer's role, from designing in a vacuum to collaborating with users and facilitating the design process (Botero & Hyysalo, 2013; Mattelmäki, 2008). Wilson et al. (2015) comment that adopting co-design techniques blurs the boundaries between designers and users. According to Botero and Hyysalo (2013), this shift has led to a fear that co-design makes professional designers unnecessary, and further suggest that this might sometimes be the case, for example working with lead users and technology-savvy people. Nevertheless, there are many product types and end-user groups that need a professional designer's expertise in order to create design solutions (Botero & Hyysalo, 2013; Wilson et al., 2015). Furthermore, it may be argued that although users can participate in the design process, sophisticated design expertise gained by education and experience is still needed to transform the ideas of the public into designs (Buxton, 2005; Sanders & Stappers, 2008).

It also needs to be remembered that design is a wide field including very specific areas, from industrial design to graphic or clothing design, and therefore, including users does not diminish the importance of designers, but only changes their role (Sanders & Stappers, 2008). Wilson et al. (2015) state that adopting co-design techniques blurs the boundaries between designers and users. Sanders and Stappers (2008) also show how design and design research are approaching each other, and how the roles of a researcher and a designer will overlap more in future.

Sanders and Stappers (2008) explore how the same level of creativity cannot be required from everyone, but state that users of different levels of ability should be included in the process. This requires sensitivity and skill from the facilitator to encourage, guide and lead participants of different levels to give their best input into the co-creativity process (Sanders & Stappers, 2008). Botero and Hyysalo (2013) point out that often those who are ignored in design, for example those who find technology challenging to use, are the ones who would most benefit from collaborating with a designer to improve products. Similarly, Wilson et al. (2015) argues that the co-design process should aim to be inclusive, highlighting the importance of effective communication skills, and (2015) suggesting that a combination of co-design methods

should be selected that facilitates the involvement of people with communication impairment and other disabilities.

### **Short history of co-design**

Sanders and Stappers (2008) conclude that co-design traditions have developed in parallel in the U.S. and Europe. The user-centred design approach was created in the 1950s in the U.S., whereas participatory design was created in Scandinavia in the 1970s (Bodker & Pekkola, 2010). The Design Research Society held a conference in Manchester, in the UK, in 1971 called Participatory Design, which was the first time the term was introduced (Lee, 2008). A characteristic of Scandinavian participatory design is democracy in the workplace, and workers' engagement in the design process (Gregory, 2003).

Especially in Sweden, Norway and Denmark, participatory design methods have been used to engage workers to improve their working environments, tools and methods (Gregory, 2003). According to Heinemann et al. (2012), participatory design created practices to enhance collaboration between different stakeholders: users, trade unions, employees, managers and suppliers. Co-design and co-creation are newer terms for participatory design (Sanders & Stappers, 2008). Still, Sanders and Stappers (2008) find that co-design and co-creation are misleadingly used synonymously, and they consider co-creation a wide and abstract term which does not require the design of material products. In their (2008) opinion, co-design is a specific form of co-creation, which indicates that people with no design education are participating in the design process.

In the early 1980s, design companies started to collaborate with social scientists in order to better understand user requirements (Sanders, 1999). In the 1990s, user-centred design had become mainstream, and Sanders wrote in 1999 that there was a shift happening, from user-centred design to participatory design (Sanders, 2002). In the 2000s, co-design gained more attention and academic research into co-design increased, with the academic journal, '*CoDesign*', being first published in 2005



(Scrivener, 2005). Although the concept of co-design was well known and acknowledged in academic research by the beginning of the 2000s (Sanders, 2002), a major breakthrough in commercial companies was slow (Sanders & Stappers, 2008). The following section discusses some barriers to user involvement in co-design.

### **Barriers to co-design**

Involving users in the design process can help to avoid product failures and usability problems; save money and time in new product development; increase product awareness among customers; and create user empowerment (Hoyer et al. 2010). Even though engaging users can create great value for a company, it is not an easy or straightforward process, and it requires extra effort from the company (Thomke & von Hippel, 2002). Weber et al. (2012) stress that involving users in the design and development process contains risks, costs and strategic consequences. That is one of the reasons why industry has been slow to adopt collaborative design methods into their product innovation and development processes, even though there has been growing interest in user involvement in co-design; new co-design methods are being increasingly developed; and the value of engaging users into corporate innovation processes is well-acknowledged in academic research (Buur & Matthews, 2008; Sanders & Stappers, 2008).

Several reasons have been presented for why it has taken a relatively long time for co-design methods to become adopted as common practice – over 40 years have passed since the 1970s (Hoyer et al., 2010; Sanders & Stappers, 2008; Thomke & von Hippel; Weber, Weggeman, & Van Aken, 2012). Firstly, collaborative design is a radical idea, and it changes the ownership of design as well as the power constructs (Sanders & Stappers, 2008). Buur and Matthews (2008) also suggest that adopting user-centred and collaborative design methods would require a reorganisation of resources in companies. These two above points are also supported by Hoyer et al. (2010) who state that involving users leads to decreasing control, plus collaboration management between all stakeholders becomes more complex. This change in design practice is challenging for both sides. For industry and designers, the challenge lies in giving the

decision power to consumers, and for consumers, it is in believing that they can be creative (Sanders & Stappers, 2008).

According to Sanders and Stappers (2008), the co-creation concept requires the belief that everybody can be creative, but there is no consensus over this among design researchers nor practitioners and industry. An example of this is a lead-user approach presented by von Hippel (2005), who suggests that only experts can participate in the design process. As a second reason for the slow adoption of co-creation, Sanders and Stappers (2008) name passive consumerism, and they think that it will take time before people are willing to actively participate in a creation process. Thirdly, co-design has been seen as an academic design theory that has not been actively adopted into practice in a commercial sense (Sanders & Stappers, 2008). Interestingly, their article was published in 2008, and several years later the situation has slowly changed, but not completely. The fourth reason the authors suggest is that user experience is becoming an important advantage for companies when technical quality and price are equal with competitors (Sanders & Stappers, 2008).

### **Co-design methods**

At the same time as the benefits of co-design have become widely known and user involvement in product design has become more popular, an increasing variety of co-design methods, techniques and events have been created (Andersen, Danholt, Halskov, Hansen, & Lauritsen, 2015; Lucero, Vaajakallio, & Dalsgaard, 2012; Vaajakallio & Mattelmäki, 2014). There are already several books about co-design methods that can help in selecting co-design methods (Hanington & Martin, 2012; V. J. Kumar, 2012; E. Sanders & Stappers, 2012; Van Boeijen, Daalhuizen, van der Schoor, & Zijlstra, 2013). For example, Martin and Hanington's book *'Universal Methods of Design'* presents 100 methods for user participation.

Buur and Matthews (2008) propose three different approaches to co-design planning: 'the lead user approach', 'participatory design' and 'design anthropology', and these can all influence the co-design method selection. The lead user approach is based on

collaborating with enthusiastic leading edge users, who have new needs, modification ideas and innovations that can also benefit the majority of consumers (von Hippel, 2005). On the other hand, participatory design encourages lay people, who might not be used to creative design thinking, to contribute their ideas to design, and this influences co-design techniques and facilitation (Buur & Matthews, 2008). Steen (2011) sees that commercial businesses often use the lead-user approach, which is opposite to the participatory design approach that emphasises the needs and wants of common users. The third approach, design anthropology, also requires a different set of methods, because it is a term that is used for user research that is conducted over a long time period (Buur & Matthews, 2008).

Two examples of exploring design ideas with users are design probes and design games (Madden, Cadet-James, Atkinson, & Watkin Lui, 2014; Mattelmäki, 2005; Vaajakallio & Mattelmäki, 2014). Design games can be used in collaborative innovation to inspire users to playfully come up with new solutions (Mattelmäki, 2008). The idea is to encourage users to express their opinions, reactions and feelings by the means of role playing and fictional stories (Vaajakallio & Mattelmäki, 2014).

The design probes are a tool package that help users document their experiences, feelings and attitudes an inspiring way, and therefore help designers collect data from users (Mattelmäki, 2005, p. 83, 2008). The probes are based on the user's self-documentation, and toolkits can include documentation equipment such as notepads, postcards, disposable cameras, diaries and tape recorders (Mattelmäki, 2005; Weber, 2011). Cultural probes were first introduced in 1999, when Gaver et al. (1999) delivered them to older people to get information about their living environments, and since then, probes have been developed further (Madden et al., 2014; Mattelmäki, 2008). Madden et al. (2014) name four purposes for probes: inspiring design, gathering data, increasing participation and facilitating dialogue. Weber (2011) emphasises how probes are primarily intended to be used in an exploratory way, and to inspire all stakeholders. Both of these views are supported by Mattelmäki (2008), who explores how probes are suitable for data collection, but particularly for

inspiring all stakeholders, supporting collaboration in multidisciplinary teams, and gaining insights into users' private experiences.

The shift to participatory design means that facilitation skills become crucially important. Traditionally, user research has been carried out by social researchers and psychologists, but the shift to collaborative design makes facilitation skills a new requirement for designers.

## **The quality of engagement in co-design**

In co-design research literature, the term 'quality of engagement' covers the factors of good practice in user involvement and collaboration. The following quote describes well how successful co-design is dependent on human relationships, whether between the team and users or within a multi-disciplinary team.

*"The development of support for collaborative design should target not only methods of solving design problems but also informal and social interactions that bring together different stakeholders while respecting their differences."* (Feast, 2012, p. 215)

Although collaborative design has gained popularity among design theorists, it is not widely accepted in corporate environments in the clothing design field. Now co-design is becoming more popular and its benefits more acknowledged, which, in turn, creates more challenges. Some of the practical difficulties of involving users may be caused by the perceptions of professionals, who could be resistant to user involvement (Buur & Matthews). For example, challenges may arise in an organisation from miscommunication during multi-disciplinary collaboration between different departments or design teams (Buur & Matthews, 2008; Karlgren & Ramberg, 2012). These collaboration aspects are looked at more closely in the next section. When considering the quality of engagement in co-design, it is important to consider the viewpoint of the participant (Heinemann et al., 2012). When companies increasingly

start to adopt co-design methods and engage users in design processes, it is vital that the impact on the users involved is considered.

## **Co-design guidelines**

There are no research studies looking at user engagement and team collaboration in clothing co-design relating to older people. There is an existing gap in evidence-based research about good practice in the co-design process. There are a few works that discuss what needs to be considered when involving older people in the design process. These four papers discuss older user engagement in the design of software, mobile devices, home robots and assistive technology.

Botero and Hyysalo (2013, pp. 48–49) conducted a research study engaging older people in designing calendar software for their community, and listed 13 things they learned from the experience:

1. *“Start with social practices.*
2. *Explore the constituency.*
3. *Begin with small but relevant ‘access design.’*
4. *Manage expectations by anchoring.*
5. *Develop an open agenda.*
6. *Build scaffolds.*
7. *Go there and be there.*
8. *Build and release prototypes iteratively, rapidly and from early on.*
9. *Alternate close working periods with lighter engagement.*
10. *Foster ownership of the process, technology and media.*
11. *Stay attentive to partial failures and what can be learned from them.*
12. *Embed design at different levels.*
13. *Avoid design locking-in with crucial choices.”*

In the paper, Botero and Hyysalo (2013) explain the above list in more detail, with a caution that some points might not be applicable in all circumstances as every projects

is different. Of particular note is the importance placed on people getting to know each other and other stakeholders and that meetings are held frequently. Motivating people to maintain involvement is essential and Botero and Hyysalo suggest the following strategies: starting with easy tasks, providing hands-on workshops, and the early release and testing of prototypes. Botero and Hyysalo suggest that it is essential to know the community and their needs, and furthermore that catering to the needs of the community is more important than reaching a previously set goal. They recommend having clear goals and clarifying expectations, because false expectations can cause frustration. Botero and Hyysalo. Furthermore, they recommend learning from failures, because this can give new ideas.

Massimi, Baecker and Wu (2007) have done collaborative mobile phone design with older people and have created seven guidelines for designing with older people. Firstly, they recommend that designers 'provide alternative activities'. Older people can have disabilities that prevent them from fully collaborating, and therefore it is good to offer alternative methods. Secondly, they propose that organisers should 'create temporary subgroups to overcome deficits'. This means that they recommend grouping people with different disability levels into the same group so that they can help each other. Thirdly, possible auditory problems of older people require that facilitators 'minimize crosstalk'. Their (2007) fourth point is to 'make participation an institutional affair' to make sure older people have a context that they understand. The fifth point that Massimi, Baecker and Wu (2007) propose is to 'provide activity structure', which means giving a clear agenda. The sixth point they make is 'speed up or down to suit the group'. It is important that the whole group keeps up. The last piece of advice they give is to 'blend individual and group sessions' (Massimi et al., 2007).

Iacono and Marti (2014) conducted a case study with older people involved in home robot design. They have collected four points that they recommend when designing with older people. The first point they make is that "*knowledge is not acquired by older people once and for all*". This means that it cannot be expected that older people learn to use a product immediately. Secondly, that face to face or hands-on evaluation is a

more effective method than remote strategies such as a video-based evaluation. A further point is that games can create an open and enabling atmosphere suggesting that *“playing together is an effective means of participation”*. A final point, that has been made previously in this chapter, is the importance of effective communication and particularly that *“the role of the facilitator is essential”*. Iacono and Marti (2014) elaborate on the importance of the facilitators’ role, identifying 4 key attributes:

- the ability to build *“an empathic and trusted relationship”* with the participants
- creating a relaxed ‘family’ atmosphere
- listening emphatically and without judgement
- using clear and understandable language and developing a shared language with participants

Williamson et al. (2015) conducted a case study of good practice guidance on public involvement in assistive technology research finding that members of the public felt a positive impact on confidence, self-esteem, enjoyment and contribution. Williamson et al. (2015) further identified several practical actions that influence user experience, including participant being kept fully informed through the provision of project papers written in an accessible style and sent well in advance of meetings. A friendly facilitation style was seen as important, with participants encouraged to speak and assured there are *‘no stupid questions.’* Secondly, the meeting room was organised according to good practice. Advisors had also given opportunity to introduce themselves before actual collaboration. Several advisors had liked being part of the research and continued to take part other research projects. Research team members were surprised how much influence advisors had on design (Williamson et al., 2015).

Chambers (2011) has written an entire book about participatory workshops, but it is based on his professional expertise, not scientific research. He wanted to write a sourcebook for facilitators even though he does not consider himself to be a professional facilitator. His ideas are very relevant and I will discuss them compared to my findings in my Discussion chapter.

## Multi-disciplinary collaboration

Harfield (2004) suggested that people in the same discipline share not only aims, a knowledge base, skills, competencies, materials, problems, concerns and perspectives, but also they show loyalty to fellow members, even when being critical (Dykes, Rodgers, & Smyth, 2009). It can be argued that different disciplines think about, and solve, problems differently (Anderl, Völz, Rollmann, & Lee, 2009), which can provide a challenge to multi-disciplinary collaborative working. There are various terms referring to collaboration between different disciplines within design. Some of these terms are 'multi-disciplinary design', 'cross-disciplinary design', 'interdisciplinary design' and 'trans-disciplinary design', but Dykes, Rodgers and Smyth (2009) claim that they cannot be used interchangeably.

Sanders and Stappers stated in 2008 that traditional design domains were already blurring (Sanders & Stappers, 2008). The development of communication technology gives new opportunities for design collaboration. Traditional design practice has also been challenged in other ways. One of the biggest changes is that people who do not have any formal design education are designing, and design is being practised by people with different professional backgrounds (for example social science), but also by lay people (Dykes et al., 2009). This is based on the idea that everybody is creative, not only professionals or lead users (Sanders & Stappers, 2008). Secondly, product design and service design are blurring and merging, and often the same company can offer both. The third difference that Dykes, Rodgers and Smyth (2009) name is the fading boundaries between traditional design disciplines, such as clothing design, interior design, product design and graphic design. Nowadays, often the same designers or design companies do combinations, or all the above. Anderl et al. (2009) state that it is important that all disciplines can communicate in a way that everybody understands.

Good collaboration in multi-disciplinary teams is crucial for successful product development (Anderl et al., 2009). Fuad-Luke (2009) proposes that the real spirit of design comes from the possibility that design can give a higher meaning to things. He



sees the power of design in the co-operation between professionals and lay people, when they co-design something in a creative way, and he highlights how the real relevance of design lies in its ability to be proactive (Fuad-Luke, 2009). Nissani (1997) cautions that interdisciplinary team work can be challenging. In the following excerpt, Svensson (2003, p. 193) argues that disciplinary fences should be taken down:

*“First of all, we have to be willing to break out of discipline-specific structures; as we all know, walls between disciplines or departments do not exist only in the academic world.” (Svensson, 2003, p. 193)*

Hackman has presented five factors that positively influence building effective teams (Coutu, 2009; Hackman, 2002). Firstly, *‘teams must be real’* meaning that the leader needs to make clear who belongs to which team, and that this is clear to all involved. Secondly, *‘teams need compelling direction’*, suggesting the requirement for common objectives and purpose. Thirdly, *‘teams need enabling structures’*: that is the right number and skill mix of people conducting clear tasks. Fourthly, *‘teams need a supporting organisation’*, which enables team work. The last point is that *‘teams need expert coaching’*, which is especially important in different main phases of the project (Coutu, 2009; Hackman, 2002).

Van Mechelen et al. (2014) has identified six factors that hamper effective team working in co-design with children, that may be equally applicable to working with adults. *‘Unequal power’* refers to dominating people in the co-design team, who talk more than quieter people. *‘Free riding’* means people who belong to the group, but do not participate in the work. *‘Laughing out’* refers to people not taking tasks seriously and having fun, but not effectively working. *‘Dysfunctional conflict’* means people who do not get along with each other and hamper team work. *‘Apart together’* refers to people working in clusters and artificially concluding the work. The last phenomenon, *‘group think’* means poor compromises in name of the group consensus. Franz (2012) has also listed six general hampering factors for teamwork: *‘unprepared team members’*, *‘an inappropriate team structure for the task’*, *‘poor*

coordination', 'miscommunication', 'faulty decision making', and 'high interpersonal conflict'. The first six hampering factors were listed in the context of children, and the latter six were general hampering factors in team working. In the Discussion chapter, these twelve factors are discussed in the context of older people participating in co-design.

## **Shared knowledge and language**

An important part of successful collaboration is not only having professional skills, but clear and effective communication (Kleinsmann, Deken, Dong, & Lauche, 2012), which is often referred to as shared language. According to Thomas and McDonagh (2013), shared language refers to *"individuals developing understanding among them based on language in a way that it helps them communicate more effectively"*. In 2006, Kleinsmann proposed the following definition for co-design in her PhD thesis (Kleinsmann, Valkenburg, & Buijs, 2007, p. 60):

*"Collaborative design is the process in which actors from different disciplines share their knowledge about both the design process and the design content. They do that in order to create shared understanding on both aspects, to be able to integrate and explore their knowledge and to achieve the larger common objective: the new product to be designed."*

Kleinsmann et al., (2007) study on aspects that either advance or hamper good collaboration in a co-design process concluded that effective collaboration in a design process requires good communication between stakeholders and shared understanding. They concluded that effective collaboration in a design process requires good communication between stakeholders and shared understanding, which means similar perceptions about the design task at hand. Thomas and McDonagh (2013) claim that when shared language is created together with the whole team, it is at its most effective. Kleinsmann, Valkenburg and Buijs (2007) also propose that, during the design process, the diverse knowledge stakeholders should be transformed into integrated knowledge through processes of knowledge sharing and

creation. Kleinsmann, Valkenburg and Buijs (2007) chose two case studies from the transport industry. The conclusion that Kleinsmann, Valkenburg and Buijs (2007) reached was about communication at the project level. They (Kleinsmann et al., 2007) found that efficient information delivery and high quality project documentation were the keys to successful collaboration at the project level. Thomas and McDonagh (2013) propose that shared language can help to decrease project costs when common goals are clear and ineffective communication does not hamper the project.

# The research objectives and question

The specific objectives were:

1. To identify the factors that affect the experiences of older people involved in design research, co-design and product development.
2. To critically examine trans-disciplinary research and identify the factors which aid or hamper effective collaboration.
3. To develop evidence to inform the production of good practice guidance for the involvement of members of the public in design research, co-design and product development.

The research question was:

What are the factors that facilitate or hamper co-design projects?

## Chapter summary

This chapter has demonstrated the literature on the topic. This chapter was divided into the search strategy and then three major parts, including older people, public involvement and design approaches. Each part presented the literature on each topic area and the chapter highlighted the lack of evidence-based research on the topic that is to be the focus of this thesis. There are lots of texts around co-design, but scientific papers on the co-design process involving users are missing. The chapter has therefore provided validation for the need for research which seeks to address this gap. The next chapter will consider the most appropriate approach to meeting this research gap.

## CHAPTER 3. METHODOLOGY

This chapter presents the methodological deliberations and decisions made for this study. The first section discusses the theoretical framework. The following section presents the choices of methodology and the justification for selecting a certain approach. This is followed by a discussion of the chosen case study methodology.

### **Theoretical framework**

There are two approaches to enquiry in the social sciences, the structured and unstructured approach, and both represent different research strategies (Bryman, 2012). The key characteristic of the structured approach is that the research process is predetermined and conducted in a structured order, contrary to the unstructured approach, which permits flexibility in the research process (Kumar, 2010). Quantitative research is seen as a structured process and unstructured research is called qualitative research, although some believe that these two research methods should not be categorised in this way (Bryman, 2012). Gorard and Taylor (2004) state that the terms quantitative and qualitative are a way to categorise methods, yet both quantitative and qualitative research can have the same aim, and therefore the methods can be combined.

In general, qualitative study forms a holistic picture with words, and quantitative studies can be measured with numbers (Creswell, 1994). Both approaches have their place in research, and they are very commonly used together to support each other and lessen their weaknesses. One characteristic for qualitative research is an understanding of social realities, as it concentrates on the experiences of participants (Flick, von Kardorff, & Steinke, 2004). Epistemological foundations and ontological concerns differ in these two approaches, which lead to different research strategies and positions on the role of theory and the use of data (Bryman, 2012).

According to Crotty (1998), there are four elements that inform one another in research, and which every researcher needs to decide on before they begin. The epistemological approach means the theory of knowledge that will be used, and it is chosen first (Crotty, 1998). The epistemological stance affects the selection of a theoretical perspective, which is a philosophical stance informing methodological decisions (Crotty, 1998). Creswell (1994, p. 9) gives four reasons to select either a quantitative or qualitative paradigm: the “researcher’s worldview, training and experience of the researcher, researcher’s psychological attributes, nature of the problem and audience of the study.” The methodology is the strategy that affects the methods selection (Crotty, 1998).

Some elements of the research process include the epistemology, the theoretical perspective, the research approach, the methodology and the method (Gray, 2009) (See Fig. 5.). My choice for the epistemology is constructivism. Constructivism was selected because there is no singular truth in the constructivism paradigm, and therefore, reality is perceived to be subjective. This means that there are multiple ways of seeing every event, and reality is produced by human intelligence. The theoretical perspective choice for my work is interpretivism, which acknowledges that there is no single external reality, but multiple realities depending on the observer. This means that there are no direct relationships with the world, and reality is interpreted by the people (Gray, 2009).



Figure 5. *The five elements of my research process*

Time and place can make the realities different. The research approach used was inductive, because there was no starting hypothesis to test. In an inductive approach, data is collected and analysed first to see emerging patterns and relationships (Creswell, 1994). In inductive thinking, it might be possible to create generalisations, relationships or theories from the data in the data analysis phase (Creswell, 1994). According to Gomm (2004), there are three types of generalisation: empirical or statistical generalisation (used in quantitative research), theoretical generalisation (used in the natural sciences and sometimes in the social sciences) and naturalistic generalisation (meaning thick descriptions, used in qualitative studies).

The methodology choice for this study is a case study, which fitted with my expectations that mixed methods may be needed. As set out in the next chapter, the primary data collection methods were semi-structured interviews and observation. The chosen methodology was a single case study with four units of analysis. My methodological choices will now be further explored.

### **Conceptual framework for running co-design projects**

Miles and Huberman (1994) describe a conceptual framework as a narrative or graphic representation of the key factors in the study and the relationships between them. They claim that no matter how inductive the study is, it is important to define categories and themes (1994). Miles and Huberman (1994) continue to say that these themes come from theory, experience and study aims. This study was exploratory in nature and the focus of the research was to seek new insights in the facilitating and hampering factors in the co-design process. I attempted to find an evidence-based theory about what needs to be considered when leading co-design projects with users. I considered different types of systems theories for conceptual framework, but they were not suitable. I also considered collaboration and co-production models, but they did not fit my purposes either. All of these were too general and did not fit specifically to co-design. No existing theory was identified that could be used when researching user involvement and collaboration in the co-design process. That is why I chose a largely inductive approach. However, I could see the benefits of being aware

of the theories and practical approaches to participatory workshops (which were to be the key vehicle of user-centred design in the DfAW project) and I was drawn to the work of Robert Chambers. Chambers (2011) has collected the key elements of preparing participatory workshops (see Fig. 6.) .

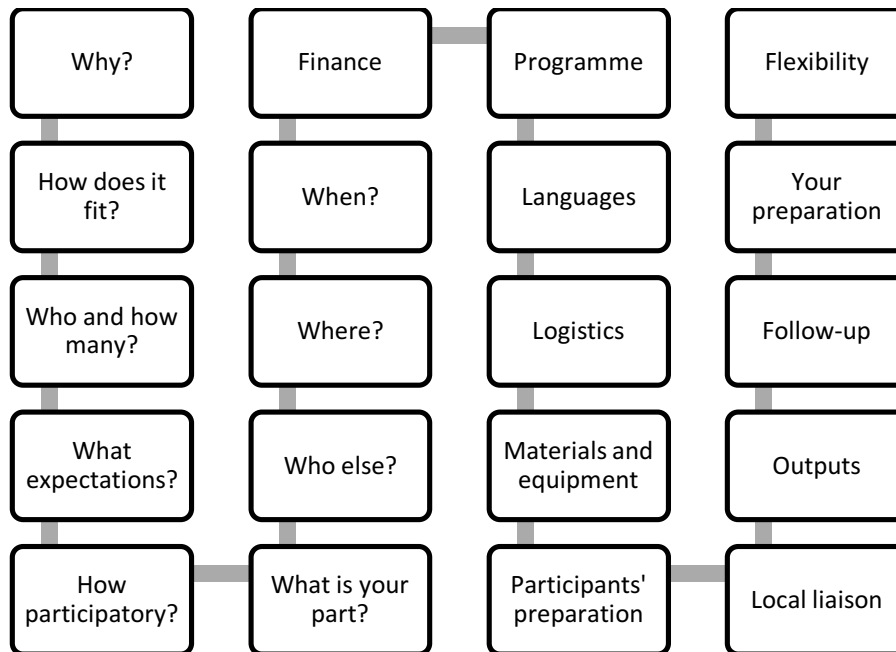


Figure 6. *The conceptual framework according to Chambers' (2011, pp. 4–6) ideas*

The aim of the exploratory research is to generate ideas and propose new understandings, and therefore I decided to adopt Chambers' ideas as my conceptual framework.

This research was influenced by several underpinning beliefs. The underpinning knowledge was about co-design methods and facilitation. The target group of the design were older people. Ageing affects participation and knowledge about the effects of ageing influences co-design methods and public involvement. Public involvement researchers have done research about how to involve users in the research process, and that knowledge is useful here. Co-design largely happens in teams, and therefore an understanding of collaboration in teams is crucial.



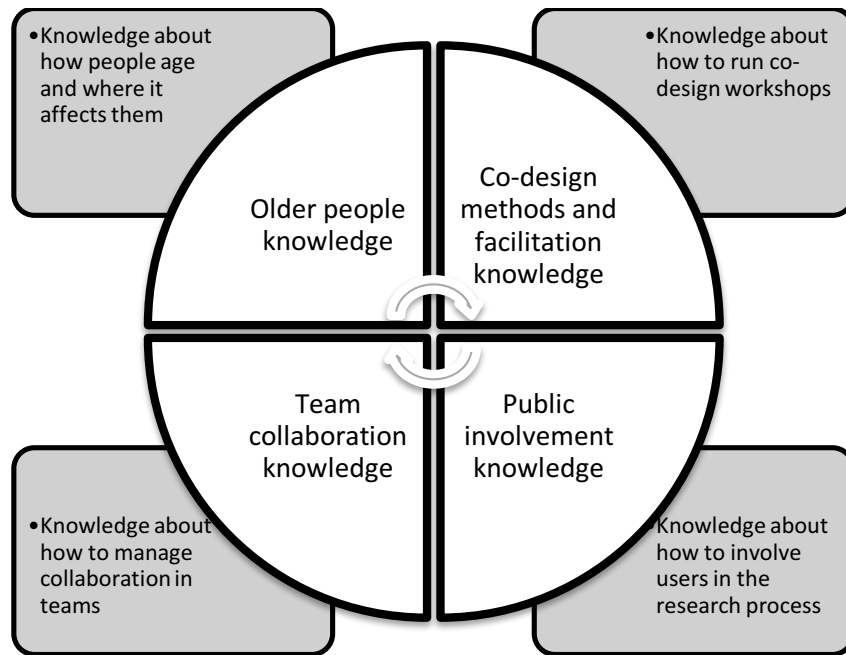


Figure 7. Knowledge areas that influence this research

Therefore, these four areas are identified as the conceptual framework underpinning this study’s investigation of older users’ involvement in co-design process.

### Methodology choices

Qualitative research can be seen as a wide term which covers a variety of research techniques and philosophies (Hennink, Hutter, & Bailey, 2010). Mason (2002) claims that doing qualitative research can be highly rewarding and important, because “it engages us with things that matter, ways that matter”. She (2002) defends her statement by explaining that qualitative research methodology provides the opportunity to explore people’s experiences and their understandings of complex everyday life and social interactions. Qualitative research can take the form of ethnography, phenomenology, grounded theory, action research or case study methodology. All of these methodologies combine a compatible set of principles to inform the whole process of research (Crouch & Pearce, 2012). Qualitative and quantitative methodologies have different methods. Some of the qualitative methods are different types of interviews, focus group discussions, observation, content

analysis, visual methods, life histories or biographies (Hennink et al., 2010). Flick (2007) has listed the positive characteristics of a qualitative research design. A clear focus, research questions, methods and sampling are part of good research design and important for the manageability of the research (Flick, 2007). Crouch and Pearce (2012) highlight that it is important to consider methodologies in light of the research position, and as a tool for making intellectually well-informed decisions during the research process.

As it is necessary to provide a rationale for the qualitative research approach, it is important to present clearly reasoned choices behind the chosen methodology or triangulation of methodologies (Crouch & Pearce, 2012). Triangulation means gaining evidence from different methods from the same events (Gomm, 2004). Crouch and Pearce (2012) remind us that methodological decisions lead the researcher to produce certain kinds of knowledge, and may affect the limitations of knowledge. Epistemological foundations differ in quantitative and qualitative methodologies (Bryman, 2012). Crouch and Pearce (2012) stress that the most important thing is that methodological decisions are clear, purposeful, coherent, ethical, and capable of enabling researchers to engage in the kind of enquiry they intend to carry out. Creswell (1994) emphasises the importance of a good purpose statement and reminds us that they differ slightly depending on whether researchers choose a qualitative or quantitative approach.

Quantitative and qualitative research strategies differ from their epistemological foundations (Bryman, 2012). In quantitative research, reality is seen as objective and singular, and the process of research deductive, the opposite of the subjective and multiple reality and inductive approach seen in qualitative study (Creswell, 1994). Quantitative research has the possibility of making statistical generalisations, whereas qualitative research can create thick descriptions of the phenomenon and participant's experiences. Quantitative research is suitable for testing theories and qualitative research is capable of generating new theories (Bryman, 2012). Both approaches have their place, because the research aims and purposes define the right

choice. I chose the qualitative approach, because this approach requires thick descriptions of the participant's experiences.

In the following sections, I will present the most common qualitative research methodology options and explain why I have chosen the case study methodology. Since I have chosen to use only qualitative research methodology, I am not presenting quantitative methodology possibilities.

## **Ethnography**

According to Doodley (2001), the meaning of ethnography is literally 'the description of an ethnic group'. Ethnographic research is interested in how different types of groups or communities live and experience their lives and the world around them (Robson, 2011). The ethnographic researcher attempts to gain a holistic picture of the researched community, including the economic, cultural and economic context (Hennink et al., 2010). Common research methods in ethnography are participant observations, interviews and the analysis of artefacts and documents (Creswell, 2013). A typical feature for ethnographic research is the observation of participants, but it also involves participation in the lives and daily activities of research participants (Robson, 2011). Observation allows researchers to record the behaviour, actions and interactions of people in systematic way (Hennink et al., 2010).

Ethnographic research has a long tradition and aims to describe a particular cultural group or particular cultural practices (Crouch & Pearce, 2012). Ethnography can also be called field research (Gomm, 2004). Ethnographic research grew out of the discipline of anthropology: the study of human beings, their lived experiences and their cultural practices, and colonialism made anthropology important when new societies were found (Bryman, 2012). It tried to explain how differently these newly founded societies experienced daily life. Anthropological research took place typically in the field and sometimes researchers spent long periods of time, several months or even years, living alongside the researched society (Crouch & Pearce, 2012). Observations can be of different things and Creswell (2013) gives some examples

including the “physical setting, participants, activities, interactions, conversations”, and the researcher’s own actions.

Ethnographic approaches can have different levels of participation by the researcher. Observation is commonly divided into participant and non-participant observation, and they have a long history in qualitative research (Flick, 2009). Ethnographic approaches in design research have the potential to identify and elaborate the social and cultural dimensions of design problems and solutions (Crouch & Pearce, 2012). Hennink et al. (2010, p. 47) have produced a seven-point list to consider when determining if ethnography is a suitable fieldwork approach:

- *“understand a community, village or neighbourhood*
- *get a holistic picture of a situation*
- *aim to achieve a deep insight into the lives of the study population*
- *seek the insider’s point of view*
- *wish to understand the (cultural) meaning attached to the research issues*
- *have a theory of culture underlying the research*
- *seek to participate in the life of the study population.”*

Gray (2009) states that ethnography differs from phenomenology by often researching ‘sites’ instead of individuals. Ethnographic methods were appropriate for this study but my wish to compare groups within the study did not lend itself to ethnography, which is about understanding one population in depth.

## **Phenomenology**

Phenomenology seeks to understand how people understand the world around them and it has a very strong anti-positivist view on research (Bryman, 2012). In the phenomenological paradigm, people’s experiences are studied, often in a small sample, aiming to make sense of them (Creswell, 1994; Gomm, 2004). When a researcher has chosen a phenomenological approach, it means they will concentrate on what is going on and the meaning that is given to occurrences (Gray, 2009).

Phenomenology concentrates on studying individuals, and uses relatively unstructured methods of data collection, often using as its main method unstructured interviews, although other qualitative methods can be used as well (Gray, 2009). Phenomenology acknowledges that there is no one single truth and people's experiences of reality varies (Dooley, 2001).

Gray (2009, p. 28) has collected four characteristics for phenomenology:

- *“emphasises inductive logic*
- *seeks the opinions and subjective accounts and interpretations of participants*
- *relies [on the] qualitative analysis of data*
- *is not so much concerned with generalisations to larger populations, but with contextual description and analysis.”*

One of the characteristics for phenomenology is to acknowledge that objective reality does not exist, and phenomenology seeks the subjective views of participants (Dooley, 2001). Whilst an inductive approach was valuable for this study, the lived experience approach of phenomenology did not fit the multi-participant group sample whose perspectives I wanted to gather.

## **Grounded theory**

The main purpose of grounded theory approach is to generate theory from the collected data and avoid presumptions (Charmaz & Lewis-Beck, 2004; Flick, 2009; Robson, 2011). Therefore, grounded theory is situated under the umbrella of inductive research methodologies, where the priority is given to empirical data collected from the field (Flick, 2009). Within this approach, research processes are led by data collection processes and the insights arising from them, and the study design evolves in the light of these insights. One of the characteristics for grounded theory is theoretical sampling, where the sample is defined step by step (Flick, 2009). Early insights inform who or what should be sampled next.

Grounded theory was introduced by two American sociologists, Barney Glaser and Anselm Strauss, in 1967 (Robson, 2011). Later, Strauss also developed the grounded theory approach with Corbin. One of the benefits of grounded theory is its application into fields that are completely new, or do not have existing theories (Robson, 2011). Grounded theory is a research design approach and methodology, but it can also be referred to as a data analysing method, when data is coded with open, axial and selective coding (Gray, 2009). Flick (2009) states that in grounded theory, interpretation data is much more important than data collection methods. As I already had expertise around the research topic and was familiar with much of the literature, this made grounded theory an inappropriate choice of methodology.

### **Action research**

Action research is engaged with the idea of defining problems in everyday life and finding practical and relevant solutions to them (Stringer, 2007). Promoting change in an organisation requires close collaboration with researchers and participants (Gray, 2009). In recent years, action research has gained popularity as a research method among the business, nursing and education fields (Crouch & Pearce, 2012). Action research is flexible and it allows new research questions to arise along the way, as well as the use of a variety of research methods (Crouch & Pearce, 2012). Gorard and Taylor (2004) state that action research typically takes place in real-world setting. The intention of solving the problems separates action research from other forms of research methodologies, which mainly aim to understand and explain the phenomena and develop new theories (Crouch & Pearce, 2012). There are two types of action research – one without controls, and one with control groups (Gomm, 2004). Gomm (2004) states that action research without controls is problematic, because the starting and finishing situation is difficult to define and therefore the effects of the action remain unknown. In a complex study (DfAW) with many work packages and strong leaders and facilitators, there was a risk that adopting a role as a change agent would not work well. Therefore, I chose not to pursue an action research study method.

## Chosen methodology: case study using ethnographic methods

This discussion focuses on the strengths and limitations of the chosen research approach. In this particular piece of research, there was a need to gain insights from a relatively small number of participants about co-designing technical outdoor clothing for older people. As the study examines a small sample of people and their views on social processes, a qualitative approach was deemed the most appropriate to address the research question posed. A qualitative methodology suits my research because it explores people's perceptions of the co-design process and multi-disciplinary working within design research. It should also permit a deep understanding to be gained of the different perspectives of the varied participants in the DfAW project co-design process.

The case study methodology is particularly appropriate when the focus is on a contemporary phenomenon in real life; for instance, an individual, group, organisational institution, situation or other possible social, political and related phenomena (Yin, 2008). A case study aims to contribute to our knowledge of these complex social phenomena and comes from a desire to understand these phenomena better (Yin, 2008). Stake (1995) emphasises that the case study approach is especially suitable for understanding a complex single case. The purpose of case studies is to gain holistic and meaningful new information, and to understand causal relationships between, for example, *“real-life events, individual life cycles, small group behaviour, organisational and managerial processes, neighbourhood change, school performance, international relations and the maturation of industries”* (Gray, 2009, p. 247; Yin, 2008, p. 4). Hancock and Algozinnie (2017) point out that the case study methodology can be qualitative, but also quantitative. In this work, case study methodology refers to a qualitative approach alone, because deeper knowledge is desired. The characteristics for qualitative case studies are descriptive illustrations of the case in narrative form (Hancock & Algozinnie, 2017).

I have determined that the case study methodology lends itself best to researching the available population in the DfAW research project. One of the first decisions when conducting a case study is to decide the 'units of analysis' (Gray, 2009). This is a single case study, concentrating on collaborative design and interactions in the DfAW project, with four units of analysis embedded. These four units were the team members, the project partners, the URG members and the UAG members. I could have chosen multiple case studies with different co-design projects, but I felt that the DfAW project provided a sufficient sample to answer the research question. Therefore, I ended up with a single case study with 41 participants. Simons (2009) describes a case study as research on a singular, particular and unique case, which was also the situation in this study. Robson (2011) agrees with Simons, stating that doing case study research involves seeking information about a case, or a small number of related cases. Another typical feature of a case study is that it is a study of the case in its own context (Robson, 2011).

Bryman (2012) states that case studies often have a longitudinal element, which means that the researcher is often a member of the researched community for several months and interviews take place over lengthy periods. This was also the case in this research, where the DfAW project lasted for three years, of which I was present for 2.5 years. Yin (2008) argues that usually the researcher has no or little control over the timing of the case study, meaning that sometimes the researched case happens despite the researcher being there or not. Yin (2008) proposes that carrying out a case study is a suitable methodology to choose when the research attempts to answer questions such as 'how' or 'why'. Crouch and Pearce (2012) highlight that the particular focus for the case study must be identified, because it affects the research outcome. A wide variety of research methods can be used in case studies, and the data for case studies are typically collected from multiple sources (Gray, 2009; Robson, 2011).

Yin (2008) states that a case study approach is advantageous, because it enables the use of different methods and multiple methods at the same time. Gray (2009) states that an understanding of the context can therefore be strong, which results in rich



data. The data can be in the form of artefacts, documents, interviews and observations (Yin, 2008). Yin (2008) reminds us also that a case study is a versatile methodology, because it does not necessarily require participant observation data and can be done using the internet or telephone.

The case study approach permitted me to gather and compare multiple perspectives, using ethnographic methods (asking people's views and watching them in the natural surroundings of project meetings and workshops), whilst using my existing knowledge of the topic under study. The single DfAW project gave me sufficient exposure to the characteristics of interest to enable me to answer the research question, and was manageable during a PhD studentship timeframe.

## **Rigour**

However, Gagnon (2010) points out that the case study methodology has particular weaknesses. He names three: it is time consuming and there are questions over the external validity of results and generalisability (Gagnon, 2010). Therefore, it is important to carry out rigorous case studies where each stage (research design, data collection, analysis, interpretation and reporting) is reported in detail and can be reproduced (Robson, 2011). Ensuring rigour includes a variety of things, such as internal validity, external validity including generalisation, reliability, trustworthiness, authenticity, credibility, transferability, dependability, confirmability and credibility (Gray, 2009).

## **Internal validity**

Gagnon (2010) agrees by stating that case studies need to be carried out by systematic procedures, which secure validity. Validity and the possibility of replication give research its trustworthiness. To ensure validity, Gagnon (2010) recommends following a practical guide book, which describes each step in detail. Gagnon (2010, pp. 5–9) presents his case study handbook with eight stages and several steps in each stage. These eight stages are:

- “assessing appropriateness and usefulness,
- ensuring accuracy of results,
- preparation,
- selecting cases,
- collecting data,
- analysing data,
- interpreting data and
- reporting results”.

### **External validity**

The case study methodology has a few challenges. Gray (2009) names three as being generalisation from the case, the lengthy time case studies take, and the potential for a large volume of documentation. The potential generalisability is part of the external validity (Gray, 2009). Yin (2008) states that there are two different types of generalisation. Statistical generalisation is used in surveys and analytical generalisation in case studies, where theory may be made based on a particular set of results (Yin, 2008). Analytical generalisation is difficult, because statistical generalisation techniques do not fit. Bryman (2012) points out that case study results are only applicable in the same or a similar population. Several cases or several units of analysis can help with analytical generalisation and the modifying of existing theory, but it is not necessarily the goal (Gray, 2009). One point of view is that the findings are interesting in their own right (Robson, 2002). It was not a goal of this study to seek wide generalisability, as this would require additional research with other cases beyond the DfAW project.

### **Reliability**

According to Gray (2009), reliability means “the stability of findings”. Reliability can be ensured with triangulation. The four triangulation types are: data, investigator, multiple and methodological triangulation (Denzin, 1989). In this study, I used data and method triangulation. Data was collected from different stakeholder groups

(users, team members, project participants). I used two methods, individual interviewing and non-participant observations, for method triangulation.

## **Chapter summary**

Concluding this chapter, I can say that there are wide variety of methodologies that could have been chosen. Qualitative research methodology was chosen for this study and this chapter presented the rationale for why this was the case. This chapter provided an introduction to the most common qualitative research methodologies and presented the rationale as to why a certain methodology was chosen. A case study approach was the most suitable option for this work, and this section has gone some way towards explaining why this was the case. This chapter ended with a section considering rigour, validity and trustworthiness.

## **CHAPTER 4. METHODS**

This chapter presents four alternative research methods and the rationale for choosing two of them. The primary data collection method was interviews, and these were complemented by non-participant observation. As discussed in the last chapter, qualitative research is a research methodology that allows researchers to examine people's experiences in detail, by using certain research methods or a combination of them.

Bailey (1994) states that the research problem and the data collection methods are linked decisions. The researcher should be able to choose the appropriate research methods to answer, in the best possible way, the research questions (Bailey, 1994). The qualitative research method options considered were focus groups, individual interviews, participatory workshops and observation. After consideration, I in fact chose an individual semi-structured interviewing technique and non-participant observation as my data collection methods. When making the selection for this study, methods were sought that provided the opportunity to further explore the views, experiences, beliefs and attitudes around outdoor clothing design as a means of examining co-design processes. Each method is explored next, and details given for final choice of methods.

### **Interviewing**

One of the most used qualitative methods is interviewing (Kumar, 2010). One form of interviews is individual interviewing and another form is group interviewing as a focus group (Krueger & Casey, 2009). I will present focus groups first, and then individual interviewing.

## **Focus groups**

Hennink et al. (2010) state that the focus group method is suitable for several types of research, for example, explanatory, exploratory, evaluative and policy-oriented research. Hennink et al. (2010) address how focus group discussions suit the researcher's aims very well when the aim of the research is to gain new information from an unexplored or little explored topic, or where the issues are unclear. Focus group discussion is well-suited for these kinds of purposes, because as a method it allows a large amount of data to be collected in a short period of time (Hennink et al., 2010).

Activities in focus group sessions may vary, but the most common one is to have an interactive discussion between participants (Hennink et al., 2010). The aim of the focus group discussion is to listen to people's experiences and feelings about an issue, and focus group discussions can generate a broad range of views on the discussed topic (Krueger & Casey, 2009). The group environment also allows the researcher to seek opposite points-of-view, and observe how the topic is discussed (Hennink et al., 2010).

The participants for focus groups are usually purposefully selected and often have personal experience of the discussed topic (Krueger & Casey, 2009). Kruger and Casey (1994) suggest that one of the most underestimated things within focus groups is the importance of the recruitment of the right people. Hennink et al. (2010) warn that the method is not recommended or very suitable if the research focuses on very personal and sensitive topics, because confidentiality cannot be fully guaranteed in a group setting and people may not feel comfortable discussing their personal issues in a group. Sometimes group members can support each other in sensitive issues of this nature, especially if it is an already established or familiar group, but it is left up to the researcher's consideration to decide if one-to-one interviews are more suitable for a sensitive research topic.

Focus groups can encourage people to open up and share experiences (Barbour, 2007), but focus groups are harder to manage than interviewing individuals (Bryman, 2012), and therefore two facilitators might help manage the group. A researcher needs to consider how many participants is a good amount, because often all the people do not turn up and it is logistically hard to get people together at the same time (Bryman, 2012). Bryman (2012) warns that focus groups can have problems of group effects. Two examples are that quieter participants do not get the chance to express their opinions and group consensus can create false data.

Commonly in focus group interviews, researchers may use a discussion guide (Hennink et al., 2010), except in life story interviews where is maybe only one question. One of the proposed models is funnel design, where the discussion starts with an introduction and broad opening questions. The purpose of the introduction is to provide an awareness of the topic to stakeholders and to make participants relax and get to know each other. The aim of the broad opening question serves the same purpose of making participants feel ease. When the opening questions feel easy, participants may stop stressing about the focus group situation. One approach is that questions for a focus group can be divided into four categories in chronological order: introductory questions, transition questions, key questions and closing questions (Hennink et al., 2010). Introductory questions prepare the research topic and warm up the participants. Transition questions lead to the actual topic and the most important key questions. The aim of the key questions is to concentrate on to the main topics of research. Closing questions provide summaries of the discussed subjects and conclude the group discussion. This is also a good place to allow people to add to any of the discussed topics (Hennink et al., 2010).

According to Hirsjärvi et al. (2005), a researcher needs to make an informed choice regarding an appropriate number of interviewees, which may depend on such things as the research topic and the characteristics of interest of the interviewees. Sometimes, a group interview can encourage people to talk more and inspire fruitful discussion. When a topic is very personal, an individual face-to-face interview may help the interviewee to feel confident and open up more than in a group situation.

After consideration, I did not choose focus group-style interviews. Sometimes, members of the group can help others to remember things correctly, but they may also want to hide something or have something they do not want be discussed (Hirsjärvi et al., 2005). The sensitive nature of some of the challenges of the DfAW project meant that these sensitivities would best be managed in private, anonymised interviews, whereas anonymity cannot be assured in a group interview. I did not believe all interviewees would feel able to answer honestly and openly in a group situation.

### **Individual interviewing**

Interviews can be conducted in several ways, for example, face-to-face, by telephone, via the internet, through social media or by using Skype. Kvale (2007) defines interviews as being conversations, where the interviewer decides the construction and the objective. One means of classifying interviews is through dividing them into structured and unstructured interviews, with different levels of flexibility between these two types (Bryman, 2012; Kumar, 2010). In structured interviews, questions are predetermined, and they are asked in a decided order (Kumar, 2010). The tool or instrument often used in structured interviews is the interview guide, where questions are written down (Bryman, 2012; R. Kumar, 2010). The benefit of using predetermined interview guidance is the comparability of data (Kumar, 2010). The answers are arguably more easily analysed when they are in the same order in every interview.

The opposite approach to structured interviews is the use of unstructured interviews, which do not have predesigned interview guidance, and where the researcher is free to ask questions in any order and to use different wording depending on the situation and interviewee (Kumar, 2010). In other words, in an unstructured interview, the interview structure, contents and questions are flexible, and the researcher comes up with the questions while doing it (Gray, 2009).

A commonly used and popular interview method is the semi-structured interview technique. In semi-structured interviews, the themes and questions are thought out

beforehand, but the interviewer has the flexibility to adapt to the situation during the interview (Bryman, 2012). For example, when answering the question, the respondent may start to answer some other question which is due to be asked later. In a semi-structured interview model, the researcher allows the discussion to follow naturally and only makes sure at the end that all the questions were answered (Bryman, 2012).

Kumar (2010) highlights how the researcher must understand the importance of the order of the questions. According to Kumar (2010), the order of the questions may affect the willingness of the interviewee to answer them, and, therefore, the quality of the information. He adds that opinions differ regarding what is the best model of organising the questions. Some prefer a random order for the questions, but Kumar (2010) prefers a logical progression for the questions. Kvale (2007) prefers introductory questions: easier questions at the beginning to help the interviewee to relax, and then a gradual process of asking more important questions stimulates the interest of the respondent to answer the questions (Kumar, 2010). All interview questions should be simple, short and easily understandable (Kvale, 2007).

One approach is the interview (Hennink et al., 2010), which these authors describe as 'a conversation with a purpose'. The interview method is used when the aim of the research is to understand individual and personal experiences in people's lives or in different situations (Hennink et al., 2010). Hennink et al. (2010) remind us that interviewing requires social skills from the interviewer to show empathy and sincere interest towards the interviewee. Gray (2009) stresses also that active listening skills are important, meaning attentive listening is needed to pick up on tone and emphasis.

The expert interview is another form of interview, when the interviewer has some special knowledge of the studied field (Flick, 2009). An interviewee can also be an expert from another aspect other than their professional education, for example, personal knowledge that has been gained through their individual life experiences or hobbies (Flick, 2009). Although interviewing experts can bring lots of insights, it can also be difficult as they can have biased opinions because of their professional experience. In many cases, experts want to talk about topics that are familiar to them.



## Rationale for chosen method

There were several reasons why I chose individual, semi-structured interviews as my primary method of research. I also decided to utilise both observations and interviews, not least so data from one method could be used to cross examine data from the other. In this way, the data could be interrogated and further data sought in light of the emerging insights from each method.

Individual interviewing was chosen, because it is the most sensitive way of collecting data. Interviews can be conducted with a different number of people taking part (Hirsjärvi et al., 2005). All forms of interviews (individual, pair or group interviews) have benefits and downsides, and they can be also used to support each other (Hirsjärvi et al., 2005). Individual interviews give an opportunity to participants to say everything they want to say about the interview topics.

Group interviews could prevent participants from talking about the sensitive topics. This was quite possible as one focus of the interviews was to be on the interdisciplinary nature of the project, which could potentially raise conflicting views that would need careful management. It would also have been very difficult to manage confidentiality in a group situation, and anonymity would not have been possible. Focus groups generally need two people (one to facilitate and one to support participants and take notes), but I was a lone researcher.

An individual interview offered a much greater likelihood of understanding each team member's perspective and the issues from their discipline that might affect how they viewed the DfAW project and user involvement within it. Focus groups can be good to save time but can also be logistically difficult to manage as some voices dominate over others. As a full-time PhD student, I knew I would have relative ease in approaching my sample as the project brought everyone together on a regular basis. I also knew that because participants were attached to a project they had a vested interest in supporting me by taking part. As a PhD student, I did not have any significant position of power and so people really could decline to take part if they wanted to. Being an

insider researcher meant that I already knew there were significant tensions within the DfAW project, and that participants were unlikely to want to tackle these in a focus group. Face-to-face individual interviews were also thought to be a better approach to encourage people to talk openly, compared with non-face to face approaches.

## **Participatory workshops**

Traditionally, focus groups have been made up of relatively small groups, consisting of under 10 pre-selected participants (Hennink et al., 2010), but participatory workshops can have a much wider attendance, even over 100 people (Chambers, 2011). In general, Chambers (2011) considers participatory workshop with over thirty attendees to be large. Participatory workshops and group decision-making processes are particularly suitable for action research as they present a shared way forward. Community engagement and co-design approaches have adopted participatory workshops as an effective way of collecting information. This is because they provide an opportunity to incorporate a range of methods that would not be supported by observation or interviews alone. The length of workshops is longer than interviews and it gives more data; the opportunity for extra time gives participants the chance to relax and express their views. Time gives possibility for the Hawthorn effect to wear off. The Hawthorn effect means that participants could act differently because of the presence of the researcher (Robson, 2002).

There are a large variety of co-design methods and group activities that can provide new information (Chambers, 2011; Hanington & Martin, 2012). Examples of these are, for instance, a design charrette, where people design in small groups and move to different tables; generative research, which allows people to describe their feelings, dreams, needs and desires; and graffiti walls, which allow participants to write and draw their ideas freely (Hanington & Martin, 2012). One common denominator between methods is to engage participants visually. Sibbet (2010) proposes that visual thinking and mapping out ideas engages people, but also helps groups to understand 'bigger pictures'. Sibbet (2010) created a four-step closed-loop model that can be adopted for any group meeting. The idea of his model is to guide participants from

imagining what is possible to taking action. The four steps are imagining, engaging, thinking and enacting. At first, people need to know the purpose of the meeting and they imagine what it is supposed to be about even before joining the meeting. Therefore, it is important to give sufficient information beforehand (Sibbet, 2010). He proposes that people's thinking and expectations cannot be controlled, but they can be guided. Therefore, visuals can play an important role in inspiring people to take part and guiding their expectations.

Participatory workshops were rejected for this work partly because my sample would range from PhD students and administrators to professors, and the stronger voices in such a focus group of non-peers may have been especially difficult to manage. There were diverse perspectives about the phenomenon of interest, which I believed were better unpacked in a different way.

## Observation

Observation as a research method has a long history in qualitative research and it is very often linked to ethnographic methodology, but Flick (2009) states that it has been used much more widely with qualitative research in general. Observation presents the possibility of getting beyond people's opinions and attitudes (Gray, 2009). Observation has several levels of possible involvement by the researcher. The two main categories are participant and non-participant observation (Bryman, 2012; Flick, 2009). Gold (1958) defined four different observer roles for researchers. These four roles are:

- *“the complete participant*
- *the participant-as-observer*
- *the observer-as-participant*
- *the complete observer.”*

When researchers participate in the action itself, it is called participant observation and it can involve different levels of engagement, all the way to complete participation (Hennink et al., 2010). The complete observer researcher aims to maintain a distance

from the participants in order to avoid influencing the situation (Flick, 2009). This pure observation, also called non-participant observation, where the researcher is 'invisible', is impossible to perform fully due to the risk of the Hawthorn effect. When the observed people are not informed that they are the focus of the research, it is called covert observation, but this method is generally viewed as unethical and is a very rare approach these days.

Kumar (2010) reminds us that although ethnographic research and participant observation can give very rich and accurate information leading to rich descriptions of situations or phenomena, it can also strongly affect the researcher's perception of the researched subject. Researchers must also avoid transferring their own biases onto the research participants (Kumar, 2010).

Flick (2009) suggests that there are completely new ways of observation, thanks to developing technology. Mediated observation has become more popular: it means that the observation is made using photographs, film or video (Flick, 2009). Observational research can be also conducted by using the internet and social media. All of the workshops in this project were video recorded so that they could be watched afterwards.

Researchers can choose whether to observe then investigate deeper using interviews, or to do interviews and see the reality of what people say in later field observations. Commonly, both are intermingled. Only using observations may give an incomplete picture as the researcher may not know why people do what they do, or fail to make accurate sense of what they see. Therefore, asking the actors in those settings is preferable, to better explain what has been observed. It is not possible to observe feelings, attitudes, motivations and rationales, and these need to be asked about (Gray, 2009). The researcher can make sound interpretations having cross-referenced the data in this way (Gray, 2009).

## Rationale for chosen method

Several factors influenced my decision to choose non-participant observations. I was aware that the DfAW study design would include a series of workshops. As a PhD student on the DfAW project, my involvement in these, and therefore my influence on them, was to be minimal. I did not feel I could be a change agent and researcher at the same time during a complex, high-profile and externally funded project such as DfAW. Whilst acknowledging that my presence itself could influence participants, I had no intention of purposefully influencing the workshop content or processes as these were being managed by the project team. My preference was to blend into the background as much as possible and take field notes.

I rejected participatory workshops for similar reasons that focus groups were rejected. I felt the topic of my research was so sensitive that I would get the most meaningful data when interviewing people individually. Managing diverse backgrounds and understanding areas of expertise in participatory workshops could be a difficult thing to do, even though there was a shared focus. Participatory workshop would work well in an action research study but not in the kind of case study I wanted to develop. By being more of a detached observer, I was able to be present as a team member and people would relax, but I could still focus on what I saw without the distraction of being a co-facilitator. All of the workshops were to be video recorded, which would enable me to replay and cross-examine the data. One-to-one interviews would allow me to get deep insight into people's views. Participatory workshops often do not permit the same depth, as the facilitator is busy trying to enable everyone to be heard and managing the group dynamics and dominant voices that are often present even amongst peers. Observation would allow me to check out the observations at interview and vice versa.

## Design of tools

This section presents the development of the interview guide (see Appendix 1.). The content of the interview guide was developed through my own knowledge of the subject area, insights from the literature review and insights from early observations. It comprised 27 questions, which is longer than is ideal, but it covered the topics needed to meet the study objectives and answer the research question fully. As the sample was known to me, I knew I would likely have ‘buy-in’ from participants wanting to contribute their views. The interview guidance was planned to present easy warm-up questions first, in-depth questions in the middle, and then lighter questions last. The fieldwork observation had a significant role in creating the interview guide, because it indicated valuable interview questions and topics. There were 15 workshops and I was present in 13 of them. I missed Workshop 1 at the project start as it was held before I had been appointed and I missed Workshop 11. I only took notes during 11 of the DfAW workshops as my presence at Workshops 2 and 3 was as an informal observer only and I was therefore unable to take field notes. The field notes I went on to write during formal observations helped me to develop interview and observation topics and later themes for my coding.

The interview guide had eight topics. The first interview topic was the participant’s role in co-design and their involvement in the DfAW project. The other topics were shared language, public involvement, reflections on the process, recommendations, impact and sustainability. The intention was to end each interview on a positive note and thank the person for taking part in the DfAW research and my interview.

Videotapes from the co-design workshops provided secondary data, although I was present at most of these workshops anyway (13, but doing fieldwork in only 11), and had my own field notes of those 11.

For the observations, I used my interview coding nodes as my observation crib sheet during workshops and when viewing the workshop videos.

## **Chapter summary**

In conclusion, there were four methods that I considered using in my study: focus groups, individual interviewing, participatory workshops and non-participant observations. This chapter presents these four alternatives and the rationale for ultimately choosing the two methods I used. I ended up choosing individual interviewing and non-participant observations. The chapter finished by presenting the data collection tools for the research.

# CHAPTER 5. DATA COLLECTION

This chapter first presents study sampling, including the planned sample and the actually achieved sample. This chapter will detail the choice of sample for the interviews and observation. The data collection plan and data collection process are also presented in this chapter.

## Sample planned

To be inclusive and to gain the perspectives of the varied participants in the DfAW project, I aimed to include everybody who belonged to the case. The available population consisted of everybody who participated in the DfAW research project, which totalled 41 people. Everybody had a role in co-design and interdisciplinary working, so it was valuable to interview everybody. The opportunities to include people were through individual interviews or observations of group activities which comprised team meetings and participatory co-design workshops (n=15). Table 2 shows the available sample of 41 project participants. Minimal identifying characteristics are given to protect their anonymity.

	Participant	Gender		Participant	Gender	
1	Team member	female		1	User Reference Group member	Female
2	Team member	female		2	User Reference Group member	Female
3	Team member	female		3	User Reference Group member	Female
4	Team member	female		4	User Reference Group member	Female
5	Team member	female		5	User Reference Group member	Female
6	Team member	female		6	User Reference Group member	Male
7	Team member	female		7	User Reference Group member	Male
8	Team member	male		8	User Reference Group member	Male
9	Team member	male		9	User Reference Group member	Male
10	Team member	male		10	User Reference Group member	Male
11	Team member	male				
12	Team member	male		1	User Advisory Group member	Female
13	Team member	male		2	User Advisory Group member	Female
14	Team member	male		3	User Advisory Group member	Female
				4	User Advisory Group member	Female
1	Project partner	female		5	User Advisory Group member	Female
2	Project partner	male		6	User Advisory Group member	Female
3	Project partner	male		7	User Advisory Group member	Female



4	Project partner	male	8	User Advisory Group member	Male
5	Project partner	male	9	User Advisory Group member	Male
			10	User Advisory Group member	Male
			11	User Advisory Group member	Male
			12	User Advisory Group member	Male

Table 3. Theoretical sample

It was not known at the study outset how many participatory workshops there would be, but my intention was to observe all of those possible i.e. 13 as three took place before I joined the DfAW study.

### **Data collection plan**

The data collection plan included the creation and issue of information sheets and consent forms prior to the interviews (see Appendix 2. & 3.). All the interviewees received the information sheets and consent forms at least two days before the interview, by email. Participant understanding was checked and interviews were arranged for times and places to suit individual's preferences. Informed consent was gained immediately prior to the interview and all participants were given the opportunity to withdraw from the research. I promised to all of the interviewees that their replies would be anonymised. It was intended that each individual interview was to be done in one sitting.

### **Data collection achieved**

In total, the data collection process took 2.5 years (see Figure 8.). The 15 co-design workshops took place between January 2010 and May 2012. Three workshops (workshop 1-3) took place before I officially started in July 2010, but I observed the latter two of those workshops in May 2010 in a non-research capacity. The interview data collection process took nine months. I started my interview data collection process in May 2012, after the last workshop, and did my last interview in January 2013.

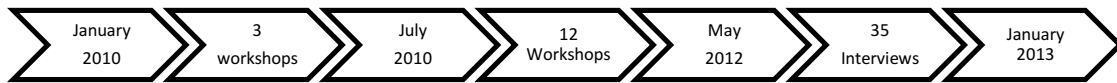


Figure 8. *Sequence of co-design workshops and interviews*

The interview dates were agreed with participants at suitable times for them. Interview dates were agreed as soon as possible after the DfAW project ended while respecting the participants' personal schedules. The nature of tensions in the DfAW project made it easier to do the interviews after the whole experience was over.

### **Sample achieved**

Of the 41 available participants, 35 were interviewed. The reasons for the non-interviews were participants not answering my interview request, despite a reminder.

Of the 15 workshops undertaken in the DfAW project, I was able to be present in 13, formally observe 11 and watch film footage of all 15. This provided 60 hours of video data and 44 hours of field note data.

This case study had four units of analysis embedded. I got an 85% response rate to my interview invitations. The DfAW project consisted of team members in three work packages (WP1 behaviour, WP2 Clothing and WP3 Technology), project partners and two user groups. The following lists the sample units and number of respondents.

The DfAW research team members (13 out of 14 possible participants)

Project partners (4 out of 5 possible participants)

User Reference Group (URG) members (8 out of 10 possible participants)

User Advisory Group (UAG) members (10 out of 12 possible participants)

One person died just after the project, and five potential interviewees did not answer my interview request. I did not find out the reasons for this.

The interviews varied in length from 20 to 197 minutes, and the average length was 72 minutes. The median length of the interview was 63 minutes. This provided 43 hours and 35 minutes of interview data, which were transcribed verbatim into 927 pages.

In addition there were approximately 80 pages of field notes from observations and ad hoc team meetings.

The following table shows the theoretical sample and the interviews conducted, including the interviewee's unit and role, as well as the duration of the individual interviews. I followed the interview guidance and asked everybody the same questions. The duration of the interviews varied considerably according to how much participants had to say, because I did not interrupt them.

	<b>Unit</b>	<b>Role</b>	<b>Duration min.</b>
1	Team member	Team member	54
2	Team member	Team member	112
3	Team member	Team leader	85
4	Team member	Project leader	197
5	Team member	Team member	67
6	Team member	Research assistant	60
7	Team member	Team member	127
8	Team member	Team member	43
9	Team member	PhD student	63
10	Team member	Team member	69
11	Team member	Team leader	90
12	Team member	Research assistant	88
13	Team member	PhD student	97
14	Team member	Research assistant	not attended
1	Project partner	Project senior advisor	69
2	Project partner	Manufacturer	132
3	Project partner	Designer	82

4	Project partner	Project senior advisor	125
5	Project partner	Manufacturer	not attended
1	User Reference Group member	User Reference Group member	44
2	User Reference Group member	User Reference Group member	29
3	User Reference Group member	User Reference Group member	26
4	User Reference Group member	User Reference Group member	78
5	User Reference Group member	User Reference Group member	34
6	User Reference Group member	User Reference Group member	20
7	User Reference Group member	User Reference Group member	66
8	User Reference Group member	User Reference Group member	56
9	User Reference Group member	User Reference Group member	not attended
10	User Reference Group member	User Reference Group member	not attended
1	User Advisory Group member	User Advisory Group member	74
2	User Advisory Group member	User Advisory Group member	56
3	User Advisory Group member	User Advisory Group member	54
4	User Advisory Group member	User Advisory Group member	48
5	User Advisory Group member	User Advisory Group member	47
6	User Advisory Group member	User Advisory Group member	62
7	User Advisory Group member	User Advisory Group member	61
8	User Advisory Group member	User Advisory Group member	144
9	User Advisory Group member	User Advisory Group member	44
10	User Advisory Group member	User Advisory Group member	50
11	User Advisory Group member	User Advisory Group member	not attended
12	User Advisory Group member	User Advisory Group member	not attended
		Total	2553
		Average	73
		Median	63

Table 4. Sample achieved

The following sections describes the individual units, interviews and the comparability of these four units.

### The Design for Ageing Well research team members

The first interview participant group was all the research team members. I contacted them via e-mail or phone call and sent them the information sheet and consent form. There were 13 team members comprising Work Package 1 (Behaviour) at the

University of Westminster and University of Salford; Work Package 2 (Clothing) at the University of Wales, Newport and the University of Brighton; and Work Package 3 (Technology) at the University of Ulster. This resulted in participants from London, Caerleon, Brighton, Salford and Belfast. Twelve of the 13 team members gave their consent to be interviewed, and I conducted 12 interviews. In the end, because of geographical distance, five of the interviews were done face-to-face, and seven were done over Skype. A videophone call application made the interviews easier, because one could see the respondent while having the discussion. Informed consent was gained from all the interviewees.

### **The Design for Ageing Well project partners**

The DfAW research project partners consisted of industry members who collaborated in the research project, or who were members of the senior advisory team. These five people were also contacted via e-mail, and I obtained four responses. Three of these four interviews were conducted by Skype and one was done face-to-face. I got informed consent from all of them. The project partners had different experiences in the project, because they did not participate in all the workshops.

### **The User Reference Group (URG) in Wales**

There were 10 active members in the URG. From the 10, I got eight volunteers to be interviewed. All eight gave their informed consent. Six of these interviews were done during the focus group meeting in the University of Wales, in Caerleon, and two of them were done via Skype. Skype interviews were only done if participants had Skype and they were comfortable using it.

### **The User Advisory Group (UAG) in Salford**

All the twelve members of the UAG were invited to participate in my study. All were between 60 and 80 years old and retired from their work. The group consisted of five men and seven women. Nine of the advisory group members were part of walking groups, and three walked with their spouse, friends or family members.

I had already explained the nature of my study in advisory group meetings, but I also contacted the members individually via e-mail to organise the interviews. I got a positive answer from 10 members of the advisory group. I got informed consent from all the interviewees. One advisory group member passed away before I began my interviews. I ended up interviewing four men and six women. Two of the interviews were conducted in a quiet café near the participants' homes, four were carried out in my office at the university, and two interviews were done at the interviewees' homes. The university's lone researcher policy was followed.

### **Comparability of units**

The units consist of different stakeholders in a research project. It is important to state that all the units of analysis are not directly comparable, and could be also called sub-cases, because the participants in this research did not all experience the same process and workshops. The team members of Work Package 2 (Clothing) organised the workshops in Wales that the URG members attended. Their experiences of those workshops can be compared. The UAG meetings were held in Salford, and only one team member other than me ran those (Work Package 1 – Behaviour). Because I did not interview myself, only her experience is comparable with the experiences of Salford UAG members. The team members of Work package 3 (Technology) were involved in some of the workshops in Wales and in the final workshop. The rest of the team members attended random project meetings, and so their experiences cannot directly be compared with the members of the public, because their experiences did not have same constancy. I attended 13 (and formally observed 11) workshops held with members of the public.

### **Ethical considerations**

Kvale (2007) lists three main ethical issues that needs to be considered whilst conducting research: informed consent, confidentiality and the consequences to the research participant, because any harm to participants should be strictly avoided. It is common practice in qualitative research to apply for ethical approval, which helps to

ensure that all of the ethical aspects are considered. The ethical approval for this study was applied for from the Research, Innovation and Academic Engagement Ethical Approval Panel at the University of Salford (Appendix 4.).

All the participants were emailed or given comprehensive information sheets and consent forms prior to the interview. Informed consent (before written consent) was checked for everyone involved in the study on the day of the interview, by asking interviewees if they had read the participant information sheets and if they had any questions. According to Bryman (2012), the consent form should ensure that participation is voluntary and make it clear that participants can refuse to answer any of the questions or withdraw completely. One important idea of the consent form is to ensure that everybody knows what they are participating in. I made sure that everybody understood the nature of the study by asking their understanding of the information sheet. All participants were given the opportunity to decide the date and venue for the interview. I took all the necessary steps for personal safety. When meeting in the cafeteria, I checked that the cafeteria was located in a safe district and the interview was conducted in a quiet area away from others. I always let a third party know where I was going and how long the interview meeting was supposed to take.

One ethical consideration is to think about the consequences of the interview situation (Kvale, 2007). The three possible scenarios are stress during the interviews, getting upset about the interview participants, or increasing self-understanding (Kvale, 2007). I was aware of these facts, but this did not happen in my study. All participants were given the chance to ask to read their transcript, but only one participant wanted to read the transcript. The DfAW project set some extra challenges for my study. There were some sensitive data and critical views from other team members that I knew would come up. The four universities had a vested interest in the project and the egos/expectations of the various stakeholders added extra tension to the group dynamics. The research team was formed with a diverse membership including junior and senior researchers, who all had different goals.

Confidentiality is one of the key ethical principles, and needed to be secured during the study and reporting. All participant information was kept strictly confidential and interview transcripts were anonymised. All the interview transcripts were coded and the consent forms were kept separately. The study data was kept on an encrypted external hard drive in a locked storage cabinet in a locked office at the University of Salford and at the researcher's home, not on a laptop. The data should not be kept longer than it is necessary and it will be destroyed according to the university's directions (after three years).

Extra care has been taken to not identify participants, especially when using their verbatim quotes. Where a quote may be from an identifiable participant, the content has been carefully checked before use to ensure their interests are protected and no likely harm would come from its use. Where this has been difficult, paraphrasing has been used.

## **Chapter summary**

To conclude, this chapter focused attention on the data collection plan and the actual achieved data collection process. The chapter presented the sample plan and the achieved sample. The planned sample of this research was all the stakeholders of the DfAW project, and 35 persons of 41 were interviewed in reality. The interview times were 73 minutes on average per participant, which resulted in 927 pages of interview transcripts. Video tapes from the workshops created 60 hours of observation data and I personally observed 44 hours live. The chapter ended with an overview of the ethical considerations of this research.



## CHAPTER 6. DATA ANALYSIS

The data analysis is one of the critical stages in the research process. Careful planning is needed beforehand to ensure reliable data analysis. This chapter presents the data analysis plan and the actual achieved process. The aim of this chapter is to describe these two elements in detail so that the whole process is made visible.

### Data analysis plan

Qualitative research often creates large amounts of textual data (Bryman, 2012; Miles & Huberman, 1994). The purpose of data analysis is to make sense of and give meaning to rich data, through a rigorous and logical process (Gray, 2009; Miles & Huberman, 1994). Qualitative data is not straightforward to analyse, and there is no one set of established and widely accepted rules agreed upon by the whole qualitative research community (Bryman, 2012; Gray, 2009). There are numerous approaches to qualitative data analysis. Some of the approaches are: thematic analysis, grounded theory, analytic induction, discourse analysis, content analysis, conversational analysis, narrative analysis and biographical analysis (Bryman, 2012).

I have chosen to use thematic analysis. Thematic analysis means that the material in the interview transcripts is categorised by themes. The plan was to identify the themes in the data and code the data according to these themes. I planned to use NVivo (Version 10) software, which is designed for analysing qualitative data. It is a well-used tool to explain and interpret social phenomena. In the planning stage I read the manual, listened to tutorials and practiced coding with NVivo 10. NVivo 10 provides organise web podcasts that people can sign into. Listening to these tutorials was very helpful to understand the software.

Since I had predefined the participants I wanted to interview, I wanted to present the same semi-structured questions (according to the research questions guidance) to

everybody, to make the data more comparable. I planned to ask interview questions in the same order, but decided to give an opportunity to an interviewee to speak on other interview topics as well. In spite of this change of order, I took care that all the topics were covered. The inconsistent order of the topics made the data analysis more difficult, but deciding the themes helped ensure that I had analysed all of the topics.

## **Achieved data analysis process**

The data analysis was based on Miles and Huberman's (1994) three-stage process, which firstly included data reduction, then secondly, data display, and thirdly, conclusion drawing and verification. This section discusses how the analysis took place.

### **Thematic analysis**

I had three different units of data to analyse: field notes, video recordings of the workshops and interview transcripts. The interview transcripts were core data and the field notes and video recordings were used to inform the interpretation of interview transcripts. The analysis was made in reflection of the research question. I did not code things that were irrelevant to my topic.

### **Observation data analysis**

I was present in 13 workshops out of 15, observed 11 workshops and watched the tapes of all 15 workshops. Field notes were written during the workshops and typed afterwards into Word documents. The observation data helped with creating themes that were used to analyse the interview transcripts (see Table 3.). Then I used emerging themes after the finalisation of the interview transcripts, to analyse the video recordings from the workshops.

<b>Themes</b>
<b>Co-design</b>
How co-design methods worked
Facilitation of the workshops
Continuity of participation
Group dynamics
Purpose
Activity planning
<b>Collaboration</b>
Team building
Shared language
Roles and responsibilities
Project management software
Communication
<b>Setting</b>
Location
Equipment
Time
Hospitality
Finance

Table 5. Emerging themes from the observation

Robson (2011) presented a five-phase list of thematic coding analysis steps that I went on to use in my analysis process. Next, I will describe the thematic analysis process I used while analysing the interview transcripts.

### **Interview data analysis**

The central idea of thematic analysis is to construct an index for the central themes and subthemes (Bryman, 2012). This suited my purposes well. The examples and subcategories were raised from the data. Therefore, the process of data analysis was inductive. Next, I will provide a detailed description of how I began to analyse the data. The software that I used was NVivo 10. NVivo 10 was chosen because of the large quantity of different kinds of data. This software allows for large quantities of data to be cross-analysed and compared.

### **The first phase**

The interviews were recorded into digital sound files. I gave all the interviewees codes and labeled transcripts and sound files according to that code system. I started my data analysis by listening to the interview sound files and reading the verbatim transcripts that were made by a transcription company called Outsec, from my interview tape recordings. The first phase is to familiarise oneself with the data (Robson, 2011). I did that by listening to and reading all the material twice. Familiarising oneself with the data is important for gaining a holistic picture.

### **The second phase**

Coding is one of the key phases of qualitative data analysis and the second phase starts with creating initial codes (Robson, 2011). In NVivo 10 coding is done through nodes, which includes information from the coded themes. By the third reading time, I coded the transcripts according to the themes that emerged from the text into nodes, which helped me to identify the key factors. If the themes were too complex, they were broken down into sub-themes. Silverman (2011) warns against making a hypothesis too early, and I followed his advice.

### **The third phase**

According to Robson (2011), the third phase of thematic coding analysis is identifying the themes. In the third phase, I continued the analysis one theme at the time, by coding the different examples that people mentioned. According to these nodes, I created the codebook. The main aim was to find all the key factors that affected user

involvement in the co-design process. At this stage, observation data was useful to identify themes. The nodes were categorised as the purpose, co-design, collaboration, setting and impact. All the nodes were placed underneath these themes. At this stage, the nodes were still modified. If some nodes were not suitable or doubled, they were merged into other codes. Identifying all the themes was done at this second phase. At this stage, I made sure that the nodes covered all the themes compared to the research question.

### **The fourth phase**

At the fourth phase, I read all the data transcripts again and coded them by the codebook. Nodes are central to working with NVivo 10 and they involve the collection of references about a specific theme, place or person. The final version of the codebook is presented on the following pages (see figure 9. and figure 10.). The codebook is a hierarchical presentation of the nodes; in NVivo 10 it is called a node tree. The fourth phase of coding is to construct thematic networks (Robson, 2011). I developed the thematic map of the analysis according to the node trees I created first in NVivo 10. Each node was given a descriptive name and NVivo 10 organises the nodes in alphabetical order for easier reading. NVivo 10 makes colour coding for all the nodes, so it is easy to follow the nodes in the transcripts. NVivo 10 also collects all the coded text underneath the node, which makes it easy to read one theme in one document. At the fourth phase, I read all the nodes through and marked the similar ones. From the similar ones, I chose the best examples for my findings chapter.

### **The fifth phase**

Robson (2011) calls the last stage of thematic coding analysis 'integration and interpretation', which means not only summarising and interpreting, but also demonstrating the quality of the analysis. According to Miles and Huberman (1994), conclusion drawing and verification are the last stages of the data analysis. I started drawing my conclusions by writing summaries of each topic and collected suitable references. Steps have been taken to ensure the validity and reliability of the data analysis.

- ▼ ● Co-design
  - ▼ ● Co-design methods
    - Brand showroom
    - Existing clothing
    - Existing fabrics
    - Explanation for co-design
    - Final workshop
    - Homework
    - London conference
    - Mystery shopping
    - Personas
    - Poster design
    - Show and tell
    - Walk
  - ▼ ● Facilitation of the workshops
    - Continuity of participation
    - ▼ ● Facilitator's role and responsibility
      - Group dynamics
      - Selecting participants
  - ▼ ● Purpose
    - Activity planning
    - Clear objectives and project scope
    - Expectations and assumptions
    - Fears and concerns
    - Motivation for involvement

Figure 9. *Final version of the codebook. Coding themes: co-design nodes. Nodes arose inductively from the data and research questions.*

- ▼ ● Collaboration
  - Communication
  - Dropped out people
  - Project management software
  - Roles and responsibilities
  - ▼ ● Shared language
    - Courage to ask
    - Disciplinary knowledge and specialist perspective
    - Glossary
    - Learning process
    - Understanding others
  - Team building
- ▼ ● Setting
  - ▼ ● Equipment
    - Recording technology
  - Finance
  - Hospitality
  - ▼ ● Location
    - Room setting
  - Time
- ▼ ● Impact
  - How co-design participation impacted to people
  - How user participation impacted to end result
  - Thank you
  - Project management

Figure 10. *Final version of the codebook. Coding themes: collaboration, setting and impact nodes. Nodes arose inductively from the data and research questions.*

## Chapter summary

This chapter has shed light on the data analysis plan and process. I chose thematic analysis. The data analysis was done with NVivo 10 software using nodes. In this chapter, I described in detail how the analysis was done and how the themes were coded. The NVivo 10 software is a sophisticated tool to analyse data, and the decision to use it has proven useful. The observation data was useful in identifying themes, but it can be said that the interview data created more thorough findings. It turned out that it was not possible by observation alone to find out how people felt about co-design. This chapter also described the five-phase process that was used to analyse the data, and ended by presenting the final codebook with node trees. In the next chapter, the study findings are presented.



# CHAPTER 7. FINDINGS

Chapter 7 presents the key findings of this study. This chapter is divided into four parts according to the different stakeholder groups. The project team members' viewpoints can be found in Part 1 and the project partners' thoughts in Part 2. The findings from User Reference Group (URG) members are presented in Part 3 whilst Part 4 presents the viewpoint of users in the User Advisory Group (UAG). Each part is broken down into themes which are introduced at the beginning of each section.

## Visual representation of findings

The users are the starting point of the co-design project. Users have a need that the co-design activity will try to solve, and this need is the purpose of the project. The findings reveal that the DfAW project had five distinct phases: definition, planning, execution, evaluation and closing (Figure 11). Co-design projects have an impact on design and people. There are three overarching themes: the *co-design activity*, the *collaboration* and the *setting*. Collaboration requires the leadership of people (soft skills), and the setting is concerned with the management of things (hard skills). Co-design activities need to have both.

Three sub-themes need to be considered in the *co-design activity*: the purpose of the co-design, the co-design methods and the facilitation of the workshops. *Collaboration* includes the sub-themes of team building, shared language, roles and responsibilities, project management software and communication. *The setting* includes the sub-themes of location, equipment, time, hospitality and finance. All these factors need to be considered and planned in co-design projects. The Findings chapter presents the results of the study considering each of these factors (sub-themes), which are represented in Figure 12.

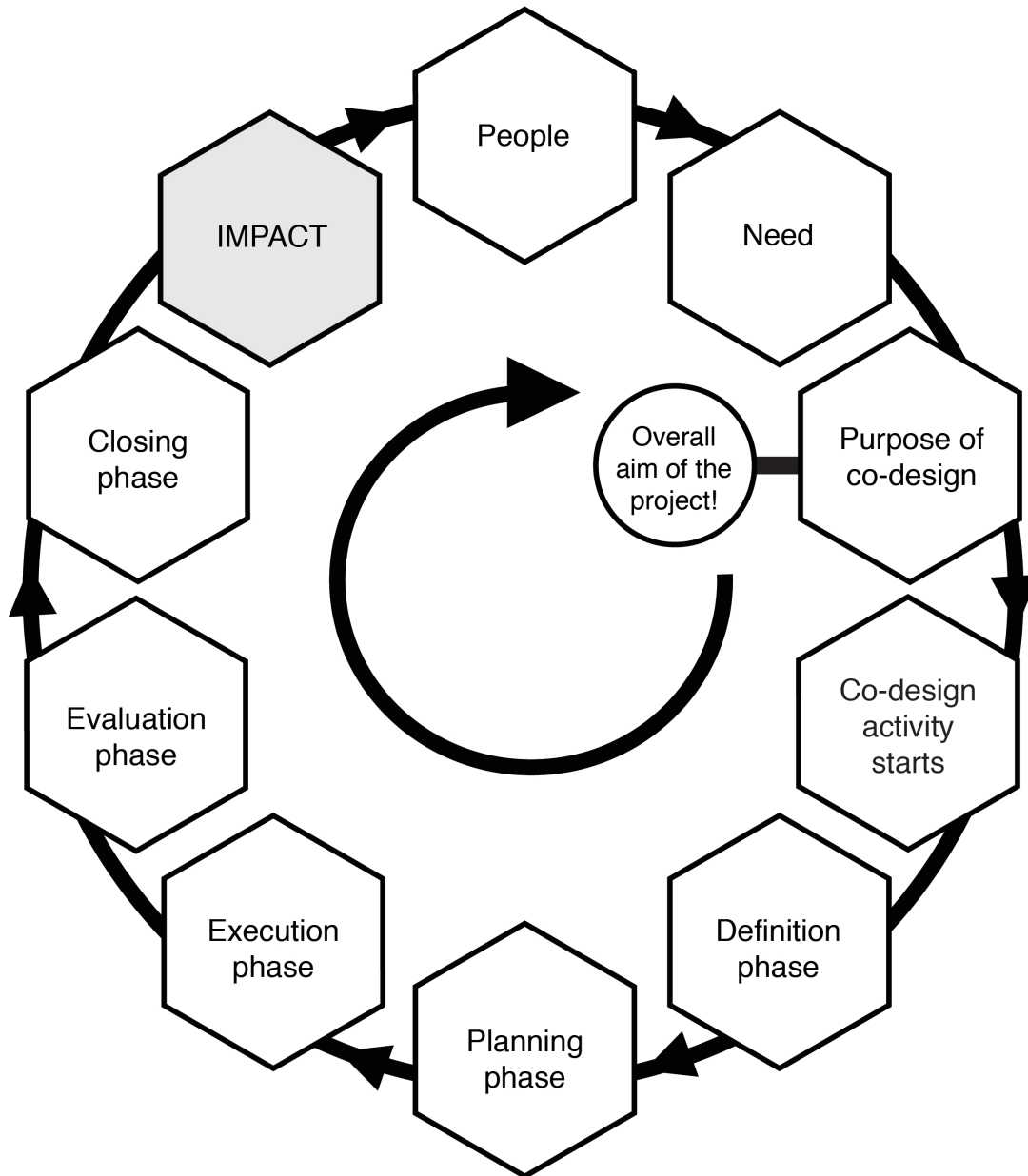


Figure 11. *Phases of the co-design project*

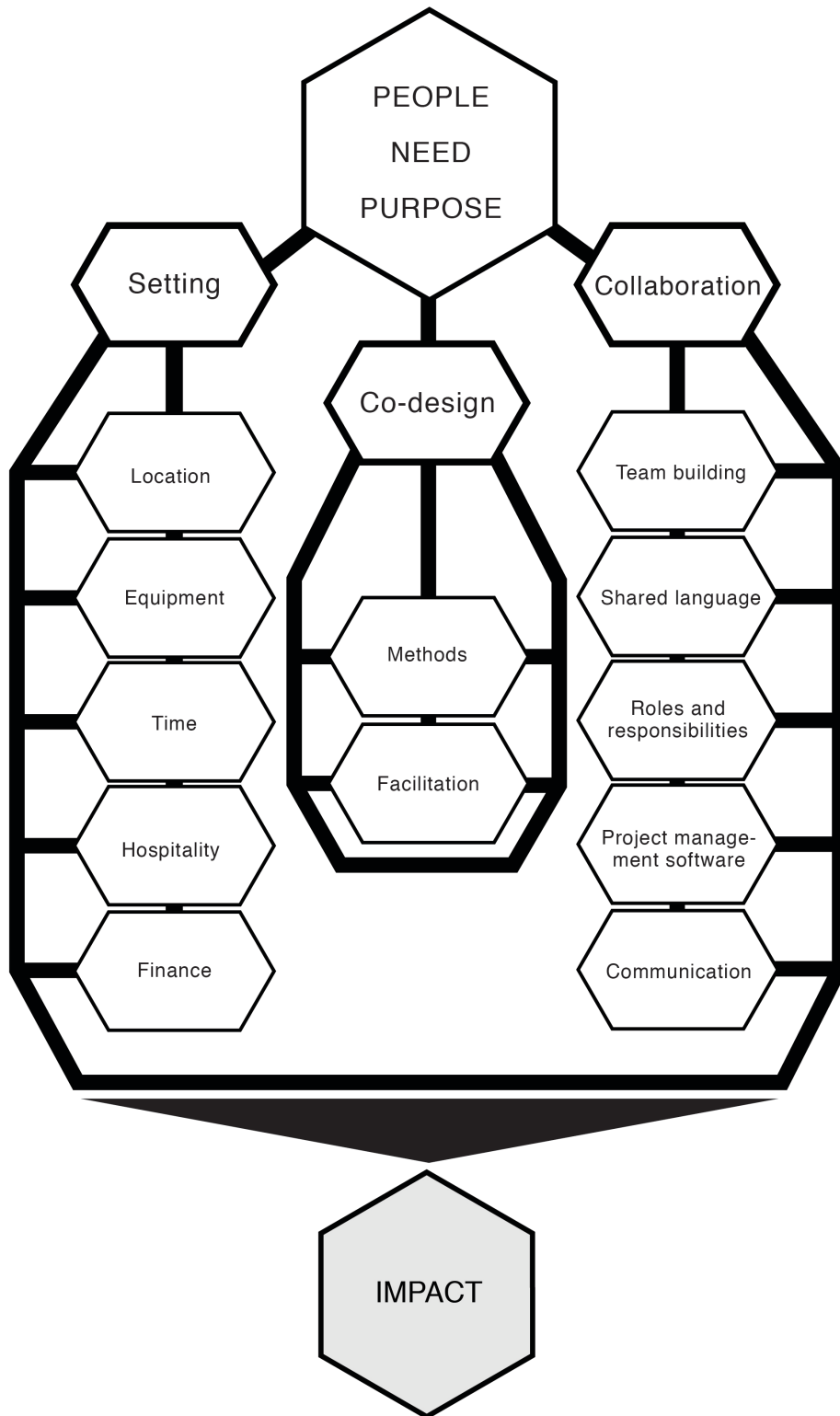


Figure 12. *Map of findings.*

## Part 1. Team members

Part 1. looks at the team members' views on A) Co-design, B) Collaboration C) Setting and D) Impact.

### A) Co-design

This section is divided into three subsections and focuses on co-design in the DfAW research project. The first subsection presents the findings about the purpose of co-design, including the motivation for the involvement and how the team members ended up working in the DfAW project. This is followed by the findings about expectations and assumptions regarding the project. The aim of this subsection is to present the findings on the importance of a shared understanding of the aim and the need of the project. The second subsection discusses co-design methods and how the team members perceived the different methods. The third subsection of the co-design section looks at the findings about co-design workshop facilitation, and the moderation skills needed at co-design workshops.

#### 1. Purpose

This section presents the findings about why this user-centred co-design project was necessary and why people were motivated to join the team that carried it out. The project lead stressed that she had a strong personal vision that smartwear and the outdoor clothing market were neglecting older people as a consumer group, and this prompted her to develop a plan for funding to research the topic. In the following quote, she describes why the DfAW project was needed:

*“What is new (in the DfAW project) is bringing a user-centred design approach and co-design in particular to clothing, and specifically it is important for the older age group because they are ignored anyway. Other*

*people can go and get clothing and take a chance on it, but this age group, it is very difficult to.” (the project lead)*

The project lead was further convinced of the existing need for the project when, at a conference, she met another researcher who brought up similar concerns, and a funding application was successfully made. The project lead had a strong vision that the project was needed, but everybody did not see the need for it in the same way. The following is one team member’s answer when asked if there was a need for the project:

*“Probably not as much as was made out in the project. I think maybe there are some, there is a niche market for older walkers who like to have that technology. To have it as a one size fits all or one system for all types of walkers, I don't think there is a market or it is useful for them.” (TM26)*

As the previous answer indicates, the target group (older people over 60) is large and growing, but the number of those within that group who are willing to buy smart clothing and wearable technology for walking is more limited. Some of the team members had doubts about the purpose and real need for the project even after the project was completed:

*“I don't see how that can be generalised either. And that was my impression of what would have been innovative out of this project, to be able to say: 'Here is a bra that can fit across this range of sizes and it can be used to get your heart rate', as opposed to: 'This is a bra specifically for X.’” (TM26)*

The above comments reveal that all team members did not fully agree on the purpose of the project and on its necessity. Some saw it as the answer to many topical challenges, while others did not see it as a solution.

## **Motivation for involvement**

I asked the team members how they got involved in the DfAW project and what motivated them to join it. The need for this research was clearly recognised by the research team members who had put themselves forward as co-applicants. One team member describes in the following excerpt an example of the details of design that might hamper the use of wearable technology for older people and how they started to think about improvements.

*“In ordinary mainstream shops and John Lewis’ for example, you can buy scarves, hats, gloves with little pockets for your iPhone. ... it’s a good idea but it’s not made usable and it’s not made accessible for a broad a range of people as possible.” (TM13)*

Initially, scoping the need for the project took place via an ESRC-funded Preparatory Network, and this led to the project proposal submission.

*“I met the overall project leader, at a conference in 2006 and, following that, we entered into a pre-project proposal to define user requirements over a 12-month period of the use of technology in smart garments, and we ran four to five workshops. And one of the final deliverables of that initial work was to submit a full proposal for the project.” (TM22)*

Having preparatory meetings enabled a sufficiently clear project focus to emerge and allowed for the identification of co-applicants to work on it. The DfAW project combined several areas of interest. It combined the wellbeing of older people, public involvement in research, user-centred practices and co-design methods, outdoor clothing and wearable technology, so it was easy for many team members to find an area of the interest in the project. A large number of team members had accidentally come into contact with the well-networked project lead already, and were given the opportunity to join the project. One team member describes how they randomly met

the project lead at a Christmas dinner, became interested in the topic, and joined the project.

*“I was sitting next to the project leader and we were talking about various things. ... We figured out we had this kind of interest in outdoor sports and clothing”. (TM23)*

The topic of the project was the motivating reason for many team members to join the project. Some team members were interested in enhancing the life of older people, whereas others were interested in designing, manufacturing and innovations. Some team members were also interested in outdoor activities and functional clothing design for personal reasons, and this project offered them a good opportunity to expand their knowledge. The following excerpt highlights how one team member became interested in the project because the topic combined ageing, co-design and sustainability.

*“There is a need for clothing that isn’t just designed for a young market and isn’t just designed for a sports market and also that has some longevity in it, that’s not just brought in Primark and thrown away, that people have some more involvement in the design process.” (TM17)*

The team members who joined the project saw it as interesting chance to combine their personal interests and professional aims. One team member described how they considered the project a perfect match for their research interests.

*“So the project presented a lot of opportunity for me to capitalize on it for my research, so I’m using it as a case study for one chapter and I’m engaging with all the partners in different ways to help me in my research.” (TM21)*

One team member suggested that they were not sure if the project was driven by the personal interests of the researchers or by the user needs. Their view was that the researchers' interests were too dominant in determining the study focus.

*"I was never sure whether we'd ended up with a project that was driven by user needs or driven by a particular point of view and how much of the end result of what we had as a proposal was trying to lever everybody's point of view in it." (TM13)*

According to the findings, most of the team members combined their personal and professional interests: they found areas in the project such as outdoor clothing and activities that they also liked in their personal life, and they saw a professional opportunity for meaningful research. The following comment suggests that the project lead's genuine enthusiasm played an important role in inspiring other team members.

*"I think the project lead was unique in the project because she had genuine enthusiasm for all the different areas. So that is where she was very important. Because, even myself, like I would go away and really and truthfully to be interested in one small bit of the project, but interested in the rest. But you needed genuine enthusiasm to make that, and an open-mindedness to make that work." (TM15)*

The above excerpt mentions the contrast between different interests. It is difficult to demand that everybody is interested in everything, but everyone needs to be interested to some extent in what others are doing and in the common goal. Some of the team members were very enthusiastic and motivated in the beginning, but lost their motivation at the end of the project.

*"I totally lost motivation towards the end and I started to hate being a part of it." (TM14)*



I asked the team members why they lost their interest and motivation. Some of the reasons were unclear objectives, roles and responsibilities. They reported that they were asked to perform different types of tasks than they had signed up for in the beginning.

*“When you don't know what you're doing and you're trying to deal with all the other shit rather than what you're actually supposed to be doing you just totally lose motivation and you kind of stop caring.” (TM14)*

Motivation is important for successful work and collaboration. The previous examples show that it is crucial for the project that everybody involved stays motivated.

### **Expectations and assumptions**

When I asked team members if they had any expectations for the project or if they knew what was supposed to happen, I got a wide variety of answers. One of the team members answered that they expected it to go well and that they had no doubts about its success. They also answered that they knew exactly what was going to happen because they wrote their own job description in the project proposal.

*“So, I wrote out what I was going to do, I wrote all my ethics documents, I got them passed through the university, so I knew precisely what I was going to do.” (TM12)*

Contrary to the previous comment, many team members did not have a clear understanding about how the project would proceed. There were very diverse views among the team members about whether they had known their job descriptions at the outset and whether they matched their expectations. Some claimed that they did exactly what they were supposed to do, while others stated that they were asked to do all sorts of things that were not in line with their job descriptions. Although they had expertise in their field and their past experiences helped them understand participatory design, and a few members of the team had done research or design

projects with users, nobody had experience in participatory co-design projects. One team member stated that they never really understood the process of the project.

*“It was never clear what was supposed to happen.” (TM14)*

Those team members who were part of the Preparatory Network and who wrote the project proposal had an understanding of what was going to happen, but they did not fully manage to transfer that information to the team members who joined later.

Most team members found it difficult to name particular expectations, but many joined the project basically out of sheer interest in the subject and were excited about it. Some team members acknowledged that their expectations were not met, and this changed their attitudes early on in the project. One reason for a change in their attitudes towards the project was a lack of collaboration in the team. This is how one team member explained it:

*“The very first meeting we had with the whole team, which was about three weeks after I started in the project, was quite an interesting experience because it wasn’t quite what I was expecting. I was quite surprised at the lack of openness and the lack of discussion and the lack of sort of cross team participation.” (TM23)*

This team member continued by giving an example of why they felt this way:

*“So we went to this meeting, it was a three-day meeting, we had three different days with different discussions, and I just couldn’t believe that the one team were very protective of everything they did and they wouldn’t let me take photographs of anything or record things, they were just incredibly defensive almost of everything they had.” (TM23)*

Another reason for frustration was the lack of a clear agenda and a plan for the project. This was reflected in various aspects, including the purpose of the project, the schedule, roles, clear aims, and a lack of planning for the individual workshops, the respondents said.

*“In the beginning I thought the project was going to go well. ... So in the early stages I was quite optimistic but after a couple of months I wouldn’t say I was worried but I was probably a little bit frustrated.” (TM26)*

Many team members based their expectations on their previous experiences.

*“At that time I don’t think I really had that many expectations because I’ve worked with research teams before, who come from a professional background that’s not like mine.” (TM16)*

The previous comment suggests that expectations are often based on the past. However, in this case, the project was very different from any of the research the team had done in the past. There were also many discipline-specific expectations that were not necessarily met.

*“Whenever we initially wrote the proposal we focused much more on vital sign measurement rather than the social interaction that was developed in the final solution.” (TM22)*

As a conclusion, some of the team members who participated in planning the project had a clearer picture of what to expect than those who joined later. As described in the comments above, the confusion regarding the research process in the DfAW project escalated progressively during the first months, when the team members had no clarity of what they were supposed to be doing and what was going to happen. Since I did not specifically ask about the concerns that the team members had before joining the project, they did not mention any. Many of them had some expectations

and assumptions about the project, based on their past professional experiences, but none of them mentioned having any concerns beforehand. Some team members were surprised by the importance of the role of the users in the co-design process.

*“I might have expected it to be more designers lead than user lead, even though it was, so I expected it to be more designers thinking up new types of clothing and outdoor clothing, for this age group, and then testing it on them and getting feedback.” (TM15)*

The previous comment reveals that some of the team members were curious about the research process and were motivated to understand it better and to learn new skills. One thing that was common to all team members was their expectations of some sort of user involvement. Expectations varied regarding the level and methods of user involvement.

*“I understood that it was about inclusive design, that it was never going to be just asking the users and then going away and designing something in a cupboard ... So I understood that aspect of it, but I was surprised at the, well not surprised, pleasantly surprised, but also pleased by the involvement the users themselves discovered in the project.” (TM17)*

One team member mentioned that project management was different from their expectations.

*“At a general level, on entering the project I thought it was another similar multi-disciplinary project similar to those that I have been involved in but it turned out to be largely different, and I think the difference was in the management style.” (TM22)*

There was no clear starting date, and some of the team were recruited when the project had officially started, and also in the middle of the project. Therefore, some of the team members did not have clear expectations.

*“I just kind of grew into the project. So, I didn’t really have a clear idea of what to expect beforehand ‘cos I didn’t know I was going into it.” (TM21)*

The conclusion of this section is that expectations varied greatly among the team members.

### **Clear objectives and project scope**

The project scope outlines what is included and what is excluded in the project. One of the team members, who took part in the Preparatory Network, stated that the project proposal was a compromise to cater to all stakeholders’ interests.

*“There was some tensions there that if you like a preparatory network might have been able to unpick a little bit more but I think we still ended up with a project which sort of levered the main players’ interests together and I’m not sure that it was particularly coherent.” (TM13)*

As the above quote suggests, the project proposal gathered together the team members’ personal interests, but the project objectives lacked clarity. There was a surprising amount of confusion about the project’s aims and scope. Some team members felt that the project was not properly planned and thought-through beforehand.

*“I think the project as a whole wasn't particularly well thought out. I remember looking at the application documents a bit later for some reason and thinking Jesus Christ, like from the day it was written it just was not planned.” (TM14)*

The previous and following comments reveal that there were no clear objectives or a project scope that all team members could have understood.

*“I do think that miscommunication could have been addressed, if we had a very clear set of outcomes at the beginning.” (TM25)*

Communication is discussed later, but the previous excerpt suggests that transparent communication is crucial in clarifying the aims and objectives for everybody in a project.

### **Activity planning**

Another important point is the importance of having a clear agenda and structure for each workshop. This section presents the findings related to planning each co-design workshop. As suggested by one team member, defining the objectives of the co-design workshop as well as the individual tasks plays an important role in a successful outcome.

*“Like surely when you have a focus group you first of all ask why you want to have a focus group. It's like planning anything. ... You figure out first what you want to get from it rather than just having everyone turn up in a room and the conversation just going. (TM14)*

As suggested by this team member, the planning needs to be based on desired outcomes, which requires that the objectives are defined. The important finding here is also that each workshop needs to be carefully planned, and just an overall plan is not sufficient. The obvious consequence of the workshops not being carefully planned is confusion among users.

*“People weren't sure what they were supposed to be doing. ... I think every time we did a focus group we sent a letter, so the aim and objective of the focus group is this but then it never followed what it was supposed to follow.” (TM14)*

In the following excerpt, one of the team members reveals that the co-design process was not carefully planned on purpose, since it was supposed to be an iterative process. I asked if there was a co-design plan.

*“No, because it was an iterative process. At that time there was no clear design. The design evolved as the project went along ... We didn’t sit down and agree at the beginning, those precise design details of what the workshops might look like or the fact that it was workshops.” (TM16)*

Careful planning and setting clear objectives for each co-design workshop could have solved the issues described above, as suggested by one of the team members at the beginning of the section. Several team members supported this view. Another team member identified chaos as a source of frustration, and according to the team member chaos caused by a lack of planning also hampered efficient collaboration.

*“Yes, I would say that the workshops in general were chaotic. They weren’t structured and they didn’t sort of follow, it just sort of went everywhere and anywhere which was fine to a certain extent, because I was there more so to observe then it was fine for that to be like that, however it did get frustrating whenever it came to our change to evaluate the technology, that chaos and the lack of structure was a detriment to our work in terms of our evaluation.” (TM26)*

If we interpret this team member’s vision literally, they accepted that the workshops were unstructured as long as they were an observer, but when they wanted to accomplish something, it became frustrating.

*“There was just no structure at all, was there, and there was no clarity between what was like the training for the teams and what was actually a focus group and what the aims and objective of each one was and why*

*people were there and there was always a really random mix of people.”*  
(TM14)

I asked the interviewees how they thought the public involvement aspect should have been improved.

*“I think that our group (URG) were quite friendly and quite casual. I thought that was a good thing. Compared to the one (UAG) I went to up in Salford, that was a lot more regimented. It was a lot better prepared to be honest, so perhaps you could be better prepared. ... But I thought it was quite good. I thought it was a good balance between being casual and not asking too much of them. Maybe a couple of times we went over but ... I thought it was alright.”* (TM21)

However, most team members agreed that there should have been clear objectives and a plan that was drafted in advance.

*“I don't know enough about co-design practice to distinguish between one approach and another but I do think there should have been like for each focus group specific objectives and they should have really been stuck to.”*  
(TM14)

This section presented the findings concerning the purpose of adopting a co-design approach. It is good to be aware of stakeholders' motivation for involvement because from the project lead's point-of-view, it is necessary to know what motivates the team. It is a plus if the team members' professional and personal interests coincide in the project since this increases motivation. The findings suggest that it is also important to be aware of individuals' expectations and assumptions. These findings suggest that a clear project scope, objectives and careful workshop planning are crucial for a successful and effective co-design project.



## 2. Co-design methods

There are a wide variety of co-design methods. Here is one team member's description about the co-design methods used.

*“There are a range of visual methods. Like you can do ordinary sketches, you can use video. ... We didn't video of what it was like for people to be walking over the hills and describing their garments in that sense. Nearly all of them were hands on with samples being brought in.” (TM12)*

In the following excerpt, one of the team members explains how the user group workshops were planned.

*“Well what I wanted was to deliver on what we'd already designed to happen, which was that we'd do an initial workshop to get people's views about walking and aging and what the issues are. ... And that workshop was actually done although it was done quite late. ... An advisory group would be set up at Salford, which was the brief of the project and that all the advisory group user input would be channelled through Salford. That was always the original plan.” (TM16)*

This did not happen as it was planned. Communication and shared language are discussed in more detail later, but there was also some miscommunication about what is meant by user involvement, advisory group and co-design. The DfAW project had two different user groups, the UAG and URG, but originally there was supposed to be only one user group.

*“Originally there was only going to be one user group, run through Salford and it was agreed it would be run through Salford because we couldn't manage the public based anywhere else in the country, they needed to be close to our locality.” (TM16)*

The following excerpt highlights the misunderstanding.

*“However, at that time, ... retrospectively, ... we could see that we had a misunderstanding of what co-design was. Because we had our view of what co-design was, we thought this advisory group model that we’d used in other projects would work fine. We didn’t understand that there would be all this prototype development and hands-on workshops, and people bringing stuff in like ended up happening in Wales, with its numerous co-design workshops.” (TM16)*

The previous comment identifies that even the team members did not fully comprehend what co-design is. There was also a misunderstanding over what the respective roles of the URG and UAG were. In a normal situation, the UAG would have advised on how to run the URG. The following comment reveals that the methods were unclear to the research team.

*“The other point with the advisory group structure was that for my mind, the Wales workshops, they were participants, they were more being researched than advisors. Advisors do have that co-design input and advising on things and what have you, but for me they were more like participants in research focus groups, which I think was a problem with them.” (TM16)*

The team member describes the confusion regarding the roles of the UAG and of the co-design participants.

*“That would have been offset if they had also had a proper advisor role, advising on what kind of workshops should we have, how long should they be, what structure should we have, what kind of group work should we have, if they had informed the design of those workshops and then contributed to them, I would have been happier but they weren’t involved*

*in the design or planning of any of them, they were just involved, so for me they were participants.” (TM16)*

The previous comments highlight the role of a User Advisory Group, but in this project, it was not used for that purpose. The URG existed separately, and co-design activities were carried out without any user advice.

There are a wide variety of not only co-design methods but also ways to have round table discussions. The four main approaches have different strengths and weaknesses. The first approach is to let everybody talk whenever they have something to say. The benefit of this is a free-flowing discussion. The weakness is that it might be difficult for shy people to have their turn to speak. The second approach is that participants speak in turn around the table. In this approach, everybody has chance to make some input, but everybody also needs to wait for their turn. This can help, but it can also be stressful for people waiting for their turn. Video recordings of the co-design workshops also show that some people got bored while waiting for their turn. Videos show that people were interested at the beginning, but their attention began to lapse when several people talked about same subject. The third alternative is to divide the group into smaller sections and to ask each of them to present their conclusions. This can serve the purpose well, but it is challenging to record. One section cannot know what is discussed in the others, and this can lead to repetition. The fourth approach is to ask users to come to a common conclusion and to come up with one design. I asked the team members if they had a preferred approach.

*“Well I think both approaches are valid but they both have a slightly different outcome. I think you’d probably find that the roundtable discussion takes longer to arrive at a conclusion and you may find in that scenario that some people are a little bit dissatisfied because they didn’t get their opinions acknowledged. So that’s a negative thing, but I still think it’s a valid approach.” (TM23)*

The team member makes a point that all approaches can be usable, but some of them take the individual user into account.

*“If you take two or three different approaches, you get slightly different outcomes, then you can step back and consider those outcomes and then decide which is the most appropriate way forward. So I think they’re both valid approaches but they both end up with slightly different outcomes.”*  
(TM23)

The previous comment suggests that it might be a good idea to try a combination of approaches and maybe compare outcomes.

## **Show and tell**

One of the first co-design activities was to facilitate a group discussion and to use the ‘show and tell’ method. The idea of the method was to ask the participants to bring their outdoor clothing to the workshop and to discuss the items. The ‘show and tell’ method was used in the initial ‘practice workshop’, in the first meeting with the users, and in all clothing layer workshops. The ‘show and tell’ exercise had two purposes. The first one was to learn from the users what they were currently wearing and whether they found their current garments functional. The second one was to show users the best examples of existing outdoor clothing and technology and to hear their opinions about them.

*“Well we started off with ‘show and tell’, to set the scene, like what were they already using, what did they like, what didn’t they like, what did they know about what was out there, so that show and tell stage was the first one.”* (TM11)

The following two quotes highlight the benefits of the ‘show and tell’ co-design method. The team members found it useful to hear about the users’ experiences

directly from them, but educating the users about the basics of the layering system and the existing alternatives was considered to be time-consuming.

*“So the show and tell – I thought that was necessary but equally it is time-consuming. ... What I meant was when we were telling them about the layering system, so when we were informing them, that was the time consuming bit. Show and tell was more useful to the designers.” (TM21)*

This team member’s opinion was also supported by the video recordings of the workshops. When there was a large focus group in the workshops, sequentially seeking input around the table took time, and some users looked bored. There are several methods to moderate a group discussion, and a roundtable approach has its benefits and drawbacks. A good aspect in the approach is that everybody will get a chance to talk and they do not need to stress about getting their turn to contribute to the discussion. The downside of this is a long waiting time for the listeners, which might lead to users losing their focus. The other benefits of the approach are the rich direct data from the users and the users learning new facts about their equipment. Focus group discussion can give plenty of information to designers if they are aware what they are looking for.

*“The benefit from the show and tell type things is showing people what is available and letting them get to grips with what is available and what is out there. ... I think that hands-on involvement with the participants is probably the most crucial or the best thing that I was involved with.” (TM24)*

The following response from a team member covers many aspects of how the team felt about the co-design workshops. One of the common notions was that the users learned along the way and that their increased knowledge influenced their opinions about the equipment as the project progressed. Another common observation was that the users grew into being co-designers. Participation in co-design workshops

educated the users about functional clothing and technology and also about being a co-designer. A team member explains in the following excerpt that the users became more talented in terms of collaborative design towards the end of the project.

*“And then by the Santoni workshops, which was quite a late workshop, they were designing, so they had become designers through the process, so they had almost been taught to have their own views and opinions on the fabrics and the shapes and the cut and the technology especially, of what they wanted and what they didn’t want.” (TM15)*

It was decided that the collection would include a seamless knitted base layer shirt for both genders. The users were divided into groups according to gender, and both groups designed the knitting structures of the shirt. The seamless knitting design exercise also highlighted to the users how difficult democratic designing is. It is much easier to simply offer a personal opinion to the designer than to come to a common conclusion which everyone agrees on. Overall, the DfAW project experimented with different user engagement methods in co-design and created valuable information about the pros and cons of each method.

## **Evaluation workshops**

One of the issues that often came up in the interviews was that the team members lacked predetermined roles. Some team members were of the opinion that there should only have been one leader and facilitator in the workshops. The evaluation workshop was set up to evaluate the prototypes, both for the garments and the technology. There were two evaluation workshops, one for each user group. The comments below are from the evaluation workshop with the User Reference Group. The following comment reveals that there was no clear view on which activities should have been included in the evaluation workshop.

*“I think one example would be the pre-evaluation workshops that were carried out in February, March, something like that. I was in the process of*

*doing an exercise with the users and then I was put under an awful lot of pressure to let the user go out for a walk, which in fairness actually just ruined the procedure and the protocol that I had for the evaluation, so that type of thing wasn't helpful to our component of the work.” (TM26)*

This team member brought up that confusion in the day's agenda hampered the work. The following comment suggests that a series of related workshops needed to be designed beforehand as a complete entity.

*“What happened was I had planned to sit down with each of the users and go through a number of steps ... and how long it took them to undertake a specific task. And, unfortunately, I wasn't given enough time to do that with all six participants because other people were pushing for them to be taken out for a walk to test the technology, which was planned anyway. ... And then, subsequently, I wasn't able to do the same task in the post-evaluation workshop to determine whether or not the users got any better performing those tasks, so that was a problem.” (TM26)*

This comment highlights the fact that if the evaluation is done several times, it should be repeated the same way each time. Another comment relating to the evaluation workshops was about the number of participating users, and whether the users needed to be the same or different each time.

*“Maybe just to reiterate on one thing: if we had had a larger number of users to evaluate the garment, had a stronger evaluation framework and had different users at different iterative cycles, I think that would have been: one, that we have a larger insight into the evaluation; and, two, we have more views or a wider distribution of feedback.” (TM22)*

As a conclusion, evaluation is a part of the co-design process that needs to be planned carefully at the beginning. If there is enough time, evaluation can also be repeated, if

necessary. In an ideal situation, there are several rounds of evaluation until the product cannot be improved.

## **Homework**

The advisory group members were also asked to write assignments at home. The comments below reveal that a better approach may have been to complete this co-design work collectively.

*“People took some homework to do which I think is useful if people are willing to take some homework to do, but I think the problem with that is people need some very clear instructions given verbally, backed up with written instructions and then telephone support or email support once they have gone.” (TM16)*

The previous excerpt highlights that if homework is given, directions must be clear and participants should have the opportunity to ask for detailed advice.

## **3. Facilitation of the workshops**

Facilitating a co-design workshop or any focus group is a skill of its own. The findings indicate that facilitation needs to be learned at a basic level before starting to lead workshops with users.

*“I personally like to have workshops that have a very clear start time, end time, breaks, as much as sometimes you have to go with the flow, but some structure to it so people know what to expect, they’re prepared, they know what the goals of the day are, you know what you’re expected to achieve so at the end of the day if you’ve achieved it or not.” (TM16)*



The previous comment suggests that it is important to give the workshop participants enough information, so that they know what to expect and can keep up with the schedule.

*“For me it was too loose and too dominated by the lead of the workshop. ... It should be a little bit more structured and recorded as to what input they had and their views taken note, where it just was sort of like a bit of a free for all, a bit of a group discussion that was quite chaotic.” (TM16)*

It was planned that the DfAW project’s UAG would be led by professional facilitators, but the sequence of events took another direction. There was one initial workshop that was led by a professional facilitator as an example for the rest of the team, but the findings suggest that non-experienced people would have needed more education than this about public involvement in co-design in order to facilitate the co-design workshops. The following findings reveal what could have been planned better and which factors regarding co-design workshop facilitation it is important to be aware of.

### **The facilitator’s role and responsibility**

Every co-design workshop needs a facilitator, and the facilitator’s role is to lead the co-design activities, to let everybody have an opportunity to speak, and to keep time.

*“If I did it again, and I was planning it, I would probably have stronger facilitation. I wouldn’t want it to be too strong, because you lose the element of spontaneity, but I think in some instances we could have had a slightly more directional setting.” (TM23)*

I asked the team members how they experienced the facilitation and whether they found that some users dominated the discussion or if quieter people had difficulties expressing their opinions.

*“There’s two schools of thought. One is that you just let people get on with things and see what happens, another is that, if you’re there as someone with some degree of expertise in a particular area, you can bring some of your expertise to the table and help facilitate the direction if you like of the discussion or the direction of the process by suggesting or showing the way, but not demanding that you do something in a particular way.” (TM23)*

One hampering effect caused by a lack of planning and agreement was not agreeing beforehand who was facilitating the workshop, which caused extra confusion for the participants. This was observed in the co-design workshops and was supported by the interviews. This comes down to activity resource planning, which requires a decision about who is leading the workshop and what the participants’ roles are. One team member describes how conflicting directions coming from several team members confused participants.

*“I also think there were too many of the project team telling people what to do instead of it just coming from one person and it being clear and concise and having a point and following a plan.” (TM14)*

Another team member provided a similar view of confusion caused by too many team members pursuing their own agendas in parallel.

*“It comes back to this other interest that whenever I was trying to demonstrate how things work, there was an awful lot going on at the same time and users weren't paying attention because their attention was drawn away drawing patterns or picking colours. They were doing something else so they couldn't listen to the instructions or anything like that.” (TM26)*

The previous comment reveals that it is important to concentrate on one activity at a time. If participants are asked to do several things simultaneously, their attention will

be divided, and they will not be able to concentrate properly on any of them. The following excerpt reminds us that the facilitator is the timekeeper, and, therefore, has the responsibility of giving everybody the opportunity to talk, but also maintaining the engagement of the participants.

*“My experience tells me that you have to vary the methods otherwise people get bored. ... There is lots of considerations to make at the time, so the facilitator needs to be reading the room and reading what is going on and see how to adapt in the light of what non-verbals people are showing.”*  
(TM16)

The comment above also highlights how the facilitator should manage the situation carefully and respond to the group. The facilitator should manage the more talkative individuals so that everybody has an equal opportunity to talk. This is not a simple task and requires effective soft skills.

*“There are always the most vocal people, and that’s quite hard to control. ... Now, I don’t know how you manage that, but that’s something I suppose that has to be taken into consideration and has to be dealt with.”* (TM17)

Another important point about compromise is made by one of the team members. Co-design which involves users is always a compromise involving individual users. It is impossible to make products that satisfy all wishes, and the brand and designer will make the final decision.

*“That comes down to your skills as a researcher and designer, yes, that you have to know that there’s a middle ground between their views, your views and experience, putting it all together and making genuine decisions around design that they’ve been engaged in. For me it’s not good practice if you ask people’s views, discount them, use our own views and make your own decisions anyway.”* (TM16)

The previous comment highlights that it is the facilitator's role to listen to everybody's opinions, but also to make decisions. Most importantly, the facilitator needs to explain openly that not all suggestions by everybody can be taken further. The following comment summarises well the basic duties of the facilitator: there need to be clear objectives, a detailed plan to achieve these objectives, well thought-through co-design methods, a schedule and a written guide on everybody's responsibilities, preferably authored by the team member.

*"As a recommendation it should be that the person who leads the co-design process should understand what co-design actually entails and have a documented methodology to follow with expected deliverables, timelines and responsibilities outlined." (TM22)*

This section covered the facilitation of the workshops. The facilitation is very closely linked to the setting, which is discussed later.

### **Continuity of participation**

The team members saw participation continuity as very important for the participants' holistic understanding of the project, and they found it very distracting that there were new people in the evaluation workshop together with people who had been involved from the outset. This was expressed because the newcomers were not aware of the processes leading up to that point, especially of learning about product design, and this hampered progress as information had to be recapped. This was repetitive for the original members of the group, and the new members lacked a depth of insight that would have been helpful. A particularly negative impact was that the newcomers then proceeded to question, sometimes at length, the design of products up to that date, and asked questions and challenged issues that had already been explained and decided upon. One team member's comment illustrates why the continuity of participation is important:

*“I think what I would have done would have been to have no outsiders, to have as little researchers as possible and only the bare minimum and just have a conversation and carry out exercises with the end users because that is whose opinion matter the most.” (TM26)*

The continuity of participation should have been decided upon before the project started. It might be a good idea for the team to consider whether the continuity of participation is important for the results. That is especially important when knowledge builds up gradually and is based on previous workshops, as was the case in this example.

*“For the actual final evaluation - both the pre- and post-evaluation - there was a new person included who had never seen any of the technology before so they were coming at it completely fresh. However, I overheard this user saying during this pre-evaluation workshop that if she had known why she was coming she wouldn't have showed up. ... I think that was unfortunate and somewhat detrimental because I don't think she actually used the system, anyway.” (TM26)*

This lack of continuity clearly hampered the technology design aspect of the study, which was a sequential process, perhaps more than the other aspects of design within the project. To counter this problem, the team member suggested that frequent attendance by the same users is key to creating a holistic understanding of the process.

## **B) Collaboration**

This section presents the findings regarding cross-disciplinary collaboration and reviews the importance of clear and transparent communication. The first section starts with the findings relating to how the team members viewed their roles and responsibilities. The second section concentrates on the findings regarding team

building and the importance of everyone in the team knowing not only the other team members' roles and responsibilities, but also their personal aims and interests. The third section reveals the findings concerning communication and the need for planning communication. The fourth part presents project management software. The last section presents the findings concerning shared language and the sharing of disciplinary knowledge.

## **1. Roles and responsibilities**

Cross-disciplinary project job descriptions, roles and hierarchy need to be decided upon beforehand. This was also the case in the DfAW project, but the findings indicate that these matters were not entirely clear amongst the team members. The findings suggest that it is important that they are carefully thought through and that everybody is aware of his or her role and responsibilities. It is also important to be aware of other people's roles and responsibilities, and that opinions about job descriptions are aired and known.

The DfAW project determined the roles and role hierarchy upfront, although implementing them as planned faced some challenges. The project was set up to have a format that consisted of three work packages. Each work package had a co-investigator, who was supposed to lead the work package, plus a research associate and a separately-funded PhD student. The overall project had a principal investigator, who was also the project lead.

The findings suggest that the decision to split one of the work packages did not work in practice. One of the challenges which arose from splitting Work package 1 between two universities was a lack of clarity regarding who was leading the work package. There was no clear work package leader, nor successful collaboration between the two parts.

The greatest challenge arose from establishing two separate user groups, the URG and UAG. This was not the initial intention and when it evolved during the project, it

needed effective change management. According to my interviews, there was no consensus on why the structure changed like this and how it was supposed to function.

*“The Salford User Advisory Group didn’t come into existence until much later, but so it was, you know you can change research in progress, so basically it has been in everybody’s interest that we have used them in the best possible way and I think that has been evident that it is good to have another group that isn’t as involved as the local ones.” (TM11)*

Initially, the DfAW research project was supposed to only have one group of users to advise the design. The team members with a public involvement background in the behaviour work package assumed that the user group would give their views about their requirements for design, which would be implemented into the design. The team members in the behaviour work package felt that they could not establish the user group since they did not have specific requirements as to which aspects of the users’ needs were to be investigated. The lack of communication and poor personal relationships involved led to challenges in problem solving and effectively prevented the user group from being established.

*“All I got was very vague stuff which was oh well we want them to be looking at buttons or bringing in clothes that they like and stuff like that and I said well that’s fine what I need is for you to tell me that in a list saying these are the point at which we would want to be able to do this sort of work and then I can do a plan of work that we can do with the user group to be able to do that. ... She didn’t deliver it to me in a way that I could use it and then she set her own group up.” (TM13)*

The design work package members and especially the project lead felt that they did not have time to wait for the user group to be established and that they needed their users to participate in co-design workshops, and so ended up establishing their user

group. The expertise of how to run focus groups was available within the team, but that information was not used accordingly. One team member found out by accident that another user group had been founded, and she had not been consulted. This was problematic for her, because it brought unnecessary confusion to her role.

*“This is part of the problem with communication. From the beginning project leader always wanted to run a group down in Newport and we said well if we're doing a user group it makes sense if we're going to have a Salford site it makes sense that we have the reference group here but she always wanted to use her friends and her contacts down in Newport and I offered to go down after this to go down and facilitate the focus groups if she still wanted to carry on with that group but they never took me up on it.” (TM13)*

The team member reported feeling offended and felt she had been ignored, with a lack of appreciation for her professional expertise. In the following comment, she describes how she accidentally found out about the URG being set up, and how she tried to deliver her expertise.

*“She wanted to meet with her whatever so she just decided to go straight ahead and do that which I found out about by accident, I think possibly because one of the others said did you know that we're doing a group? So I said well do you want me to come down and I can talk through with you about how to set up a focus group and stuff but they didn't wait for me to do that they went ahead and set it up.” (TM13)*

There were various views as to why events evolved the way they did. These excerpts highlight that everybody had own opinion about past events and the formation of user groups.



*“Like the focus groups it was never clear who was supposed to do what, even in the proposal it wasn't clear who was supposed to do what. Like a bit of the problem was the delay in the start of the behaviour work package because obviously the clothing package had to be cracking on. ... You can't take someone's work away from them and then have nothing to do but then that's just project management isn't it and like adapting the project to suit the conditions.” (TM14)*

These same examples could also be in the communications section, because the confusion was caused by poor communication with respect to changes. The reasons why events proceeded in the way they did was, however, not discussed openly.

*“The reason why that was the case was because it was taken out of our hands, because it was meant to have been run through Salford but the project lead decided to go and do it herself. ... Wales just cracked on and did their own thing. So the project lead, yes, decided she wanted to do some workshops in Wales which, you know, as project lead she could do what she liked. We didn't really have a say in the matter.” (TM16)*

Later on, the behaviour work package still needed to complete their work, because they were funded to be in the project, and they started another user group that was to be called the UAG. In research where the public is involved, it is possible to have a separate advisory group, whose role is to advise on how to operate with the users. In this case, the UAG was started much later, and this role was not suitable anymore. This series of unplanned events caused confusion through the project and hampered the understanding of roles in the project.

## **2. Team building**

One of the aims of the DfAW project was to increase the understanding of the different disciplines involved in the project, and all of the work packages held a

workshop about their expertise related to the project. Some team members specialised in business psychology and decided to hold a team-building workshop as part of the shared language workshops. The workshop/meeting took place in November 2010, one year after the project started. By that time, some team members were already frustrated because of a lack of vision, mutual planning and communication.

The process employed was to send a link to the personal development tool in advance, which was to be completed prior to the meeting. The individualised psychometric profile tool gives better self-understanding, and can help in improving working relationships with colleagues. The tool with the workbook can increase awareness of others' qualities, transform relationships, increase engagement and fire up the passion for the project at hand.

In the meeting, team members did a few exercises. One of them was an exercise to help understand how people perceive themselves and how others perceive them. Everybody was given cards describing different characteristics and aspects of personality. A person was supposed to keep the cards that described them and to give others to team members that they felt suited them best. The team members did the exercise, but it was not analysed properly.

There was also a group discussion around what everybody wanted from the project. The discussion revealed that people had different expectations of the project, ranging from having fun to obtaining academic recognition through publications. It was intended that the results would be collected to a team portfolio and delivered to everybody, but this did not happen.

The team-building exercise could have had great potential to change the group dynamics in the project and lead the participants towards more effective working and better collaboration, but it mainly generated hurt feelings. Some people felt that it was forced on them, and the project lead was disappointed that the meeting did not cover what they felt was the true intention, quantitative research. One of the

hampering factors was that the team members felt that the environment and atmosphere were not safe for them to discuss their feelings and ambitions. It transpired after the workshop that the facilitator was a team member's wife, which generated questions regarding her objectivity. This example shows that there needs to be agreement, understanding and a willingness to join team-building exercises, which is especially difficult against a backdrop of offended feelings and the lack of retrospective assessment from previous disappointments.

In the following comment, one team member states that the team building exercise did not work as it was intended to.

*"Yeah, I agree that, after that bonding exercise, everybody went back to their own institutions and that was it; hardly anyone spoke again. ... I think there are some people, specifically on work package one, that disappeared." (TM26)*

Although the team building exercise did not work as planned, it is clear that good team spirit is needed for successful projects. The findings clearly indicate that if the team is split or the general spirit is not good, collaboration becomes challenging. Therefore, it is crucial that team members get to know each other and each other's personal motives.

### **3. Communication**

The findings indicate that communication might be the single most important success factor. Two key approaches arose: communication between the team members and communication with the users who are participating in the project. Another finding is that effective communication requires listening, understanding and consensus.

*"I think communication would be probably the other big thing, which we have already talked about, as well. And I think it is probably one of the most important things so being able to communicate with other members*

*of the team, able to communicate with members of the public and do that effectively in a way that people understand.” (TM24)*

Education is key in producing understandable communication.

*“Maybe we should have had better training back at the very, very start between the team.” (TM24)*

The previous comment suggests that the team needed training to communicate with the multi-disciplinary team and users. In the following excerpt, one team member states that they felt that they were not listened to well enough and that their wishes were ignored.

*“I wouldn't say it was poor communication or lack of communication because what we had planned to do was clearly outlined and circulated before the evaluations. And we had also asked specifically for another room and for other people not to be there, and it wasn't really listened to.” (TM26)*

The communication system needs to be agreed upon, either via e-mail or a project management tool along with a communication protocol. A communication protocol includes who is responsible for providing information, when and how often.

*“That (communication) is the easiest thing to resolve in any project for sure; I am confident about this. The communication in the project was a fundamental error so if we reflect upon the project - and I raised this numerous times - Newport had a resource of the project administrator, but they didn't use that correctly. We didn't have regular conference calls; we didn't have an online resource to share documentation; there was no formal structure for minutes; there was no formal structure for reporting in the project.” (TM22)*

Communication was seen as a huge hampering aspect for successful collaboration. In the following comment, one of the team members states that both communication in the work packages and between the work packages was essential.

*“There was communication strategy, there was no structure. We'd have meetings where difficult things were raised and then were blanketed down with well we'll have a weekly conference call, or we'll do this, or we'll do that and it didn't happen and I'm sorry to say the person who needed to make it happen was the person who was leading the project.” (TM13)*

One of the team members stated that time management is a common challenge in general, and many users agreed that communication was a problem.

*“I think, in all projects that I have been involved with, time management is always a problem. I think, in particular, within this project, communication was a big problem, and that was communication between within the work packages, I would say, and across the work packages and between the work packages and the users, as well.” (TM24)*

The importance of communication and frequent updates became evident from the interview findings. Communication appeared to be one of the most critical components of good collaboration and team working. It can be stated that there cannot be good collaboration without good communication. An individual can have a great vision, but if they do not have the capability or willingness to articulate it to others in a way that can be understood, problems will arise. To ensure efficient communication, several aspects need to be well managed. As presented earlier, the basis of good communication is built at the beginning of the project. It is more effective if team members have actually met, know each other and understand each other's roles.

Effective collaboration requires a common vision and understanding of goals. Clear communication is needed during the project for sharing the status and plans of each work stream; this develops an understanding of the project roles and clarifies the aims and deadlines for all.

*“I don’t think in the beginning that it was really set up and agreed how we were going to communicate and how we were going to work. It was actually really to be honest it was set up – from the beginning it worked as three separate projects that relied on something magical happening in Wales to bring everything together. That was it.” (TM13)*

The challenges of communication were not fully understood during the project, or, at least, there was no effective attempt made to solve the issues that arose.

*“I don’t know if, as work package two, we would have known that others didn’t. I don’t think it was clear enough communication back to us, that people didn’t understand what was going on, if they didn’t. I mean me joining the project, I was later as well, I was in the understanding that everybody knew what was going on, so that was an assumption that I made. So I didn’t really pick up on this, that there was a lack of, such a lack of communication between the work packages.” (TM15)*

The previous comment suggests that the project lead and other team members were unaware that the whole team were not being updated on the status of their work. Below, we see the view that larger projects may require a full-time assignee to ensure that the established communication systems are effective.

*“I suppose what you needed was one person full time doing that really. To keep the buzz going. Somebody who would run communications office or whatever you call it, and they kept it going, they kept an active presence. Like I’d go Ning and nothing would change for weeks, and so I put things up there, I never knew if anyone read them, I never...got any feedback on*

*it, nobody ever e-mailed me and said I see what you have done, or you know, it was just a dead space you dropped stuff in.” (TM17)*

This comment reveals that some team members tried to use Ning software, a tool the project provided, but it was not effective due to the lack of consistent use. The following comment suggests that the need for tighter communication was not known by all.

*“If I had understood the need for this at the time, then I would probably have updated people all the time, across the project, what the current, week-by-week updates of where we are going, what we are doing, it is almost like every work package needed to update each other a lot more regularly about where they were thinking and just to check the alignment of everybody’s process and stage and all that kind of stuff. But then that is a big task, it is a big administrative task to do it.” (TM15)*

Every single stakeholder will have not only their perceptions of the project vision, mission and values, but also their own preferences. To achieve a successful outcome, it is necessary to understand all of these motives and drivers, and to ensure they fit together. The findings suggest that it is essential to understand other stakeholders’ visions, motives, behaviours and emotions. The DfAW project identified a solution and attempted to implement an online project management tool to partly address this challenge. The next section looks at the findings related to the project management software implementation and the challenges this can bring.

## **4. Project management software**

The use of communication software was considered at the beginning of the project and a selection was made from the multiple types of online project management software that are available. The team members also had opinions and requirements for the software.

*“And the sharing of information: right back at the beginning we were meant to set up a website at the facility and store the files, share the files; and collaboration, as well, so you would be able to jointly write papers online. And also a bit of a social networking type thing, as well, and they tried to do that.” (TM24)*

The difficulty appeared during the software selection phase for this communications need. There was no consolidated selection criteria and different team members maintained that there were different criteria and requirements for the software, disagreeing on a suitable tool. In the following excerpt, one of the team members shares his ideas and disappointments about the software.

*“Well that was one element which I was really disappointed about when we discussed it and this is a really good example of not sharing a language and not co-designing, because we discussed the whole idea, everyone thought it was a nice idea and then one party suggested something which was clearly not workable, it was very technical, it was very difficult to use, very unintuitive, didn’t have any kind of user interface and it only did one element of what we wanted it to do.” (TM23)*

One of the proposed ideas for the software was a discussion forum for team members to share conversations and ideas. The opposite opinion was that the primary need was to provide a convenient location to share files and publications. This member explains why the chosen collaboration software did not work for the intended purpose.

*“It was about sharing knowledge and about developing a language and sharing expertise, as a much bigger concept and what was suggested was pure and simple a way of putting a file somewhere so that someone else could get a copy of it and that wasn’t what we wanted. And that particular part of the team didn’t seem to understand the value of all of the other*



*things that we were trying to do in this idea of sharing information.”  
(TM23)*

The Ning software was established, but it never fulfilled the requirement for group discussion forums, nor was it an effective platform to share publications. Some of the team members found it complex to use and ultimately did not accept the tool, which further impacted the communications challenges.

*“So this Ning site was created but I think it lacked some usability, really. I found it quite difficult to use and to find things and I think maybe, looking back retrospectively, it would have been better to go with a paid version and make it useable.” (TM24)*

Almost everybody agreed that usability issues played a significant role in the poor take-up of the tool.

*“We still have an online resource for email communications and document repositories, online editing and version control, and I had researched this and proposed it to the project. And then Ning was introduced so I was really confused as to why this happened. I didn't use Ning. Ning was a terrible solution. I don't know anybody else who has used Ning, either.”  
(TM22)*

As claimed in the previous comment, the absence of sharing software caused extra effort. Additionally, the team lacked an understanding of what they had achieved together as they were unaware of what others had published. The next comment aligns with the opinion that the lack of effective online tools hampered effective working.

*“I think one of the things that was poor in the project at certain stages was communication...multi...between groups communication. You know, what*

*we needed was some sort of web forum where we could all freely communicate and we never really got that. What was set up never really worked very well, and I think that was one of the disadvantages.” (TM17)*

I also asked why the interviewee thought that the software never worked.

*“I suppose one of the things would be to have someone who was a communications key person who organised that and kept an active forum going. ... There were photographs and discussions going on, and places you could look and websites, when that happened it was really good, but it tailed off, and I think because there were some people who never contributed to it, some people that didn’t even belong to it.” (TM17)*

The following excerpt highlights issues with the project management and the project management tool. The primary reasons why the software deployment did not achieve its objectives were poor tool selection, poor introduction processes and the lack of an operational model for the software.

*“Yes, my view around that is a lack of leadership was the main reason, lack of leadership and a lack of understanding that would be an issue and a hindrance to the project if it wasn’t done well. In my mind, and from other projects, if you have a communication software that everybody can’t use or if you then don’t put in place some training to help those people use it and some support for them to use it.” (TM16)*

The Ning software was supposed to be the format for communication, but it was never fully accepted. Therefore, publications that the team produced were not systematically delivered to other team members, making them subsequently unaware of what others had published.

*“I don't know how many times I have sent things by publications to different people. Really, they should have been stored somewhere and*

*everybody should have been able to have access to them, so I think that type of thing could have been done in a better way. It probably would have facilitated communication a little bit, as well.” (TM24)*

One of the team members suggested that the project management software was not used because people did not like using it and that sharing was not part of the project culture.

*“Well I think in general it wasn’t adopted because I think some people just didn’t like the idea and therefore they didn’t use it. ... Conceptually they hadn’t bought into the idea of sharing everything in a very open way, so I think that was one barrier.” (TM24)*

Another argument raised was group commitment. In the following comment, one of the team members talks about how they knew the tool and did initially use it, but stopped due to the lack of general acceptance.

*“I think, first of all, it looked a mess in terms of there was a lot going on on the screen so I wouldn’t have said it was particularly user-friendly. ... For example, I did use it but I stopped using it because, essentially, no-one else was using it, and I think the reason why nobody else was using it was because there may have been some technical issues that they just couldn’t overcome.” (TM26)*

As a conclusion, for effective team work, the project management software needs to be simple enough to learn and be accepted by all stakeholders. The software also requires a well-planned introduction and the provision of education for all users. The project lead’s example can also help to set expectations for team members.

## 5. Shared language

One of the aims of the DfAW project was to create a shared language among the stakeholders. I asked all interviewees how they understood the term 'shared language'. In the following excerpt, one of the team members describes the concept.

*“So it (shared language) is understanding enough about the different disciplines involved and about the perspective of the user groups to be able to communicate between the various teams and disciplines and to work together to solve a problem or to solve the design.” (TM15)*

The following comment lists the various benefits that can be obtained from the development of a shared language.

*“Co-design is properly working together so, having shared goals at the outset, having some shared understandings or at least appreciation of each other’s different understandings, having agreed ways of working, valuing each other’s perspective, understanding that there are confines between what might be desired by the public and what the designers can actually do.” (TM16)*

Shared language is more than using the same words, as illustrated by the following comment, and sometimes the same words can have completely different meanings, depending upon the context and the individual.

*“Shared language I think and I thought that it meant that we were able to uncover not just language but different cultures, different ways of looking at how we do things and if you like language is the symbolic way that we express those. ... Because from different backgrounds we may use the same words but sometimes they mean different things or we may be talking about the same concept but we use different words.” (TM13)*

Interestingly, team members did not entirely share a common understanding of what was meant by shared language, or if it became evident in the project or not. Since shared language was mentioned among the project objectives, most of the team members had heard the term and had thought about it. Many stated that the idea is to understand other disciplines in order to work better together. Here is one team member's description of shared language.

*"I think the notion of shared language is that people from different disciplines use different terminologies that mean the same thing, and it was quite visionary to have a notion of shared language as one of the final outputs or deliverables from the project. ... We can have a conversation where nobody is confused with the vernacular; nobody is confused with acronyms or nobody is confused with theories or concepts that they wouldn't be familiar with within their own discipline." (TM22)*

As highlighted in the previous comment, the most important factor is to avoid confusion by helping everybody to understand the terminology of other disciplines. One team member suggested a common document which would facilitate shared language.

*"I think one thing that would have been amazing is if at the very beginning of the project some document had been written that would have been given to people joining the project just making it a bit clearer what everybody's role was. What people were supposed to do, how things were supposed to work." (TM14)*

The following response discusses the difficulty of identifying the level of understanding across disciplines for individual team members. It is possible to assume that if words are understood then the meanings are also aligned, but this may not be the case.

*“I probably would have been less aware of the need to inform both parties of the language that the other one used. Since being on the project, I understand how important a shared language is and how easy it is for misunderstandings to happen if you don’t explore those languages beforehand so that you know you are talking about the same thing.”*  
(TM17)

Another, possibly equally significant issue, is to acknowledge that the co-design project is a learning opportunity where common understanding develops along the way. The team member continues:

*“The aspiration to produce a shared language was very ambitious. I think, again from a practical point of view, we did, to a certain extent ... I guess we developed or we grew a shared language just through interaction in the project.”* (TM22)

The following excerpt supports the previous one, and adds an acknowledgement that there is no need to become an expert in another field, but having a basic understanding of other disciplines enables collaboration.

*“Well for me the whole idea of shared language is everyone helping each other to understand what their specialism is. ... However, I can help you understand a little bit of what my expertise is, because that will then help you to do your bit of the job more effectively because you’d be aware of what I’m thinking about and why I’m making certain decisions and why I’m trying to do certain things.”* (TM23)

Some team members stated that the concept was complicated and maybe too ambitious in the first place. One of the team members suggests the following:

*“I don’t personally think there was a shared language, I knew there was an expectation or a hope that a shared language would develop but I think it might be again a misunderstanding or a disagreement in what shared language actually means that was the problem.” (TM16)*

There were also opposite opinions. In the following comment, one team member expresses her view that the development of a shared language was fairly successful.

*“I think it was quite prevalent. For the designers I think we were okay because we had a good cross-language and a cross-discipline ourselves anyway. I think it was more useful for the users who were ‘lay’ – you know they were all unaware. So, yes, I thought it came out and I thought it was fairly successful.” (TM21)*

The following comment suggests that a complete understanding would be too ambitious, but a certain level necessary for collaboration can be reached.

*“My interpretation now is that we weren’t expected to all speak and talk and communicate in a certain way, it was that it would be, the project would lead to a recognition that we all need to understand each other’s language, rather than create a shared one, it was more that we needed to understand each other, had different languages and needed to understand sufficiently each others language, you can never understand it fully.” (TM16)*

The previous and next excerpts highlight very well what shared language is all about. It is not about talking in the same way, or even using same terms, but listening and wanting to understand what the other person is saying. Active listening is probably one of the key ingredients for successful communication. It is crucial to be willing to understand where the other person is coming from, instead of only holding on to one’s own opinions and looking at issues from one’s own perspective.

The next excerpt focuses on the nature of shared language, which is to ensure that terms and concepts mean the same thing for all parties. In this case ‘focus group’, ‘advisory group’ and ‘co-design’ were terms and concepts that the team members understood very differently.

*“I think it is important to engage in the process and to have an understanding of what the process involves before engaging in it. Today we talk about what my view of co-design is; nobody asked me that at the start of the project so I could have been working in the project for three years thinking that what I do is right in terms of co-design but I wasn't given the opportunity to be corrected or informed about that, so I think that is a potential pitfall.” (TM22)*

In the DfAW project, there seemed to be a clear demarcation line between the design and the technology people. Both parties had preconceptions about how the others think. Another point the team member makes is that representing a discipline can be unnerving when others do not understand your expertise.

*“How to communicate across disciplines. ... To understand the different perspectives of the different areas. That it is really hard work and it is a lot easier to stay in your own area, because you can be confident with your expertise. Whereas it is quite unnerving, when you are sitting in a group of people who don't understand your expertise and don't necessarily value your expertise as much as you, so you naturally go, become quite defensive.” (TM15)*

The previous comment suggests that shared language is about the willingness to understand others, other backgrounds and other disciplines. This team member also mentions the need to respect unknown backgrounds.



## Disciplinary knowledge and specialist perspective

Disciplinary knowledge is gained during studies and professional development. The following comment suggests that it is not necessary to share all of one's knowledge, but to select the useful information that aids others.

*"I think one of the things I learnt was that it is a multidisciplinary team, it is about co-design and sharing information, but the trick is to learn when not to share, when not to worry about forcing people to share everything. You have to have someone that decides here are the priorities about which we do need to share as much as possible and to develop an understanding, whereas all the other things that are going on, we can afford to let go, let people get on with what they are doing." (TM25)*

Disciplinary education gives tools for thinking in a specific way that fits the profession. The following answer proposes that not all fields are equally easy to understand. For example, it might be easier to understand and to learn about textiles than electronics. However, seeing and trying samples of both clothing and technology can enhance understanding.

*"So it wasn't just words, it was about looking at something, handling it, seeing how it behaved. Particularly between the electronics and the clothing, it was the experience and we actually held things and made things and handled things. And the users were the same, they got to be part of that process." (TM17)*

The above quote reveals some aspects in shared understanding between the clothing and technology disciplines. The following excerpt also brings forward the different perspectives of different disciplines.

*"I think again because they come from a certain discipline and they are not used to public involvement along the way of a project, the style was*

*mismatched with the style of some of the rest of us. I do think their approach is wrong on this occasion, and that they were missing an opportunity but it is very much the way they do things in that discipline.” (TM16)*

The following excerpt suggests that not all disciplines were used to working with users and that it was not a part of their daily practice.

*“If you were designing the smartphone application, that would be your task and you would deliver that, without necessarily having to ask questions or understand why it is needed in the context of the social needs of that group or the design needs, whereas you would use a designer then. So it is completely, it is a very new way of working, if you weren’t used to working in a multidisciplinary team.” (TM15)*

The following comment suggests that the different disciplines were not able to agree on the name and role of the user group. The team members with a public involvement background saw user involvement very differently than those from other disciplines who did not have the experience in working with users.

*“Yes, just before I get to that though, the other point with the advisory group structure was that for my mind, the Wales workshops, they were participants, they were more being researched than advisors. Advisors do have that co-design input and advising on things and what have you, but for me they were more like participants in research focus groups, which I think was a problem with them.” (TM16)*

The UAG members were not asked about their opinions concerning the workshop structure, nor about other details affecting their participation.

*“That would have been offset if they had also had a proper advisor role, advising on what kind of workshops should we have, how long should they*

*be, what structure should we have, what kind of group work should we have, if they had informed the design of those workshops and then contributed to them, I would have been happier but they weren't involved in the design or planning of any of them, they were just involved, so for me they were participants.” (TM16)*

The challenge is to recognise discipline-specific thinking and to have an understanding view of other perspectives as well. The following comment highlights the importance of recognising the different types of approaches in design:

*“If you were to ask us, the technology people, to design a technology system we would do it from a broad spectrum in terms of what components of the system we would have, what services, what they would be able to do, how the user would interact with them and so on. However, if you were to ask someone like a product designer, could you design a system, they would think of ergonomics and how it would fit into someone's hand and maybe colour and things like that, so it is just different perspectives on what design actually means.” (TM26)*

Because the members of the URG and UAG did not have the same background or come from the same discipline and, therefore, did not share the same paradigm, they were seen as being much more open to taking on knowledge and terminology from different disciplines. One of the team members felt that the user groups were more open to the shared language than the team members, whose disciplinary education affected their adoption of new concepts.

*“Whereas the user groups came completely open minded” (TM14)*

This resonates with a view from another team member as well. Here is their answer to my question about whether they thought it became evident in the project that the stakeholders had started to understand each other.

*“Challenges were between the different professional disciplines within the project, learning, at their own level, to understand and then to communicate clearly. So I think, actually, the user group were far better at understanding the different areas than... (team members).” (TM15)*

A personal willingness to have a flexible mind set can facilitate understanding and the adoption of a shared language. As one of the team members explains below, personality plays a big role in how people react to the world, including the compassion they feel towards others:

*“I’m not sure that it got fully understood, but I think certain people got it more than others. Some, I think it was about personalities as well. Some people didn’t particularly want to step outside their box, other people made that leap and embraced it.” (TM16)*

This team member continues by stating, in line with previous comments by other team members, that it was more different to communicate with professionals than with members of the public, who might be more open since they did not need to work on modifying their existing mind-set.

*“Users probably picked up more understanding of the languages I think. Well, not more understanding, but the people were very objective understanding at the languages and what was going on and were more prepared to change their minds or accept new ideas whereas some of the, you know, us in our own disciplines found it hard to step outside that.” (TM16)*

In addition, this team member had an insightful comment about professional training contributing to stronger perceptions of other professions.

*“Yes, but it was also the preconceptions of the training, you know, that we, as a designer you assume that the technology people aren’t going to be interested at all in how the thing looks or is designed or is usable or it is, the way, its comfort or its usability. Whereas then, they assume that all we mind about is colour and shape and the look of it. Whereas I find it very difficult to communicate that they are one and the same thing. So I think it was one of the biggest challenges.” (TM15)*

The team member continues with the self-aware comment that sometimes it is not easy to change your own mind set. People in general consider their worldview to be the correct one. Therefore, it requires extra effort to modify one’s thinking.

*“We (the team members) are less open to learning that shared language. Or found it more difficult to change their thinking. And myself included, from a design, like understanding, you know, letting them focus on the way that the system functioned, rather than the way it looked.” (TM15)*

The second issue related to shared language is in the execution of workshops and the different ways of teaching specialist language to outsiders. The following section looks at the participants’ opinions about the workshops held during the DfAW project.

*“So obviously each work package had to do a workshop for the rest of the team. There was never an aim. So the way that one work package approached it would be totally different to the way another work package would approach it because no one really knew what they were supposed to be doing. It’s all well and good saying do a workshop but without being clear what it is going to be on and what the point is. ... They were all just totally different.” (TM14)*

It was not easy to build shared language since the whole term remained vague. One of the best examples to highlight the different priorities of the different disciplines

was the Shimmer device, which was needed to collect data from the body, to send it to the user's mobile phone. The team members of the clothing work package felt that the device should be user-friendly and attractive, whereas the technology working package's team considered the priority to be that it functioned as intended. This caused friction between the work packages.

*“Well actually the scene that comes to my mind and I'm not sure if I'm totally correct in this, is the little box that went around the heartbeat monitor. I know that those in the design bit, you know, the clothing side, always felt it was ugly and it needed to be nicer looking, but from the point of view of the electronic team, they were much more concerned with what it did than what it looked like.” (TM17)*

The above issue was never solved in a satisfactory way. The technology people resisted searching for other options, and the design people needed to accept the solution. This example highlighted the importance of discussing and expressing one's points in a calm and appropriate way without hurting anybody's feelings. The following comment relates to the difficulties that may arise in a designer's role in a co-design process.

*“Well it was almost that you had to hold back your own knowledge. Which is really different. So from designer's perspective, on the clothing design, she was constantly having to bite her lip and not give her opinion on why that shape is wrong for, or why that design isn't right for that activity. Because of the way it was supposed to be about the user group, coming up with the ideas, the tacit knowledge of the designer wasn't relevant, almost.” (TM15)*

The previous comment suggests that the requirement for a designer also to be a facilitator in a co-design process might sometimes be challenging. The following section presents the findings regarding the learning process that happened during the project.

## **Learning process**

The steepest learning curve was among the URG members, who learned the specialist professional language during the project. One of the team members found that everybody involved learned along the way.

*“I think a lot has been learned. I think individually, everyone has learned a lot about working as a team, working across disciplines, working with users. I mean, I certainly, now have taken that back into my work and my own work and my educational work, and encouraged this sort of thinking about outside design as being something that’s very special, you know, in that it’s something that has to be useable.” (TM17)*

The above comment suggests that multi-disciplinary collaboration increased the level of knowledge of all stakeholders. The conclusion of this section is that multi-disciplinary co-design requires a change of perception from all participants. The following section presents the findings relating to understanding others in the team.

## **Understanding others**

Understanding others from different disciplines requires education and an open mind. It is important to be willing to learn about other disciplines and to get to know other team members.

*“Education of the whole team is key. I think that helps with the co-design process and the multi-disciplinary aspects, as well. And obviously to have some sort of communication structure so I think that was maybe what we were missing.” (TM24)*

The following comment agrees with the previous one, stating that successful collaboration requires open-mindedness.

*“What you, usually, need is an appetite or an open-mindedness from all those concerned, so that they are prepared to listen and to integrate as best they can the expertise that is being shared. And so the project leader bears a serious responsibility to help facilitate the integration, and it is a very demanding job.” (TM25)*

As a conclusion, shared language is a state that can be achieved through a common willingness to understand others as well as to make oneself understood. Some of the process can happen naturally, but it also requires a conscious effort. One way to improve shared language is to have the courage to ask when an issue is unclear.

Another factor in the approaches to creating shared understanding and effective communication is to consider the level of the participants. One should also be aware of the danger of underestimating the cognitive level of the listener and of making them feel intellectually underappreciated. The previous comment brings up the importance of the correct level of the language used when discussing topics with members of the public. The language should neither be too complicated nor too simplified.

## **C) Setting**

This section presents the findings regarding the setting of the co-design workshops. The section is divided into five sub-themes: Location, Equipment, Time, Hospitality and Finance. These five practical aspects need to be considered before the beginning of the user involvement, and they also need to be developed during the co-design process.



# 1. Location

There are three aspects related to location that impact the co-design experience: the location of the building, the building and the workshop room itself. It is beneficial if the location is such that the building can be reached easily, without traffic problems. In the DfAW project, the co-design workshops with users took place in Wales. Nobody among the team members mentioned travelling as a problem. Then, the layout of the building should not be too complicated, so that participants do not get lost. The following section presents the findings concerning the room.

## The room setting

There are some requirements for the room in which co-design activities take place. The following excerpt brings up the recording element. The motivation for having a co-design workshop is to extract information from the users. It would therefore be a shame if some information is lost because it is impossible to record. Therefore, the room needs to be suitable for recording purposes.

*“The co-design sessions weren’t planned as well as they could have been, so we never really had enough facilities to monitor everything that went on. So we never had enough recording equipment, we didn’t really have enough space, so it was very difficult sometimes to record everything and actually get a good quality record of all the discussion that happened.”*

*(TM23)*

The second requirement is that the room be comfortable for all participants. It is important that everybody can see each other. Depending on the number of the participants, a round table may assist in reaching this goal. The recording of the discussion sets extra requirements for the room. There is no point in having several discussions if they cannot be recorded.

*“You should be giving people the most comfy environment that you can to work in, you shouldn’t be squashed in hot rooms with the sun shining in, with the temperature all over the place, which was often the case, to sit in uncomfy seating all day is just a no no, you have got to think of your comfort, your refreshment, your brain breaks, your comfort breaks, making sure people have got fed and biscuits and sweets on the table, just things to keep their brains working.” (TM16)*

The previous excerpt brings up the temperature of the room, comfortable seats and comfort breaks. Other points to consider are the acoustics of the room and the possibility of using audio-visual equipment in a way that everybody can see it.

## **2. Equipment**

Co-design workshops may require a different type of equipment. The team might want to show a PowerPoint presentation, or a video to the participants. All equipment should be tested before the workshop. When co-design workshops are recorded for future use, the correct use of recording devices also becomes crucial.

### **Recording technology**

Co-design workshops and advisory meetings were video and audio recorded for data analysis purposes. Observation and personal experience suggest that it is good to test all recording equipment beforehand and to ensure that team members know how to use it. Every research situation is a unique opportunity, and it is a shame to lose a recording due to a lack of knowledge or testing. It is also necessary to test how wide a picture the video recorder captures and to design the room layout accordingly. This is also relevant in sound capture. The video is useless if the comments are inaudible. I used a head camera while walking, and in that setting it is even more important to know that the users fit the screen when walking. It is good to test how far the microphone carries and how loudly the users should speak. Another essential matter is to know how long the battery lasts and to carry a spare along with the knowledge

of how to change it. If the camera uses memory cards, it is important to have extra cards. Another aspect to consider is the photography and filming from the users' point of view. It is good practice that users are asked their consent before photographing and filming them.

### 3. Time

Timekeeping can represent two aspects in this context: the overall project deadline and the schedule of the workshops. The User Reference Group workshops ran systematically over time. Planning a realistic schedule and finishing on time shows respect towards all participants. The participants can have other commitments, and therefore the workshops should start and end at certain times.

Another point about starting and finishing on time is that people should not feel bad if they leave at a time when the session was scheduled to end. Time and keeping with agreed timetables is an important part of project management, but there were also team members who did not consider timekeeping that important.

*"I think they all felt comfortable with being of value and I think that is the main thing, there is no point in regimenting it if you are cutting out the sparks and the enthusiasm, I think it was okay." (TM11)*

The same view of timekeeping also comes across in the following comment.

*"I think it's very difficult to control. I think that you need people to relax in those circumstances and it's very difficult to keep telling people that they've only got five minutes or whatever. I think you need the freedom of the time and very often things change routes to what you had planned because things become very interesting and you don't want to close people off when they are being very involved and interested." (TM12)*

The appropriate use of time was one of the most contradictory aspects of the project, and there was no consensus over it among the team members. The following comment suggests that planning the workshop well and closing it on time shows respect towards the participants.

*“It's thinking you know people's time is precious. If you're asking people to give up three or four hours of their precious life it needs to be that they're going to get something from it. You know that they can go away feeling like they've done something or they've enjoyed it at the very least.” (TM13)*

One time-related aspect was the duration of the workshops. The following answer addresses the length and content of the workshops.

*“I think the slightly shorter ones were better. I think the ones where people get tired, because it is really tiring doing the workshops, like lots of breaks are really important and just time to, kind of, but the two day workshops were quite good. ... We were too ambitious, probably, with the amount of information that we wanted to get out of people in that one day. We just kind of sat people there, determined to get that information from them, in that time, which was sometimes a little bit, kind of, tiring, for everybody.” (TM15)*

The previous comment suggests that workshops should not be designed to be too ambitious.

## **4. Hospitality**

When I asked about hospitality, everybody's answer was that the atmosphere was very friendly.

*“I think the participants were treated very well. I mean there was always a friendly atmosphere whenever I was around and I relied on the, kind of,*

*professional discipline of colleagues to make sure that people were debriefed and prepared and all the usual ethical concerns were dealt with by the institution responsible.” (TM25)*

In full-length workshops, catering becomes important. It is good manners to offer the participants coffee and tea in the morning, as well as lunch. The general rule for catering is to offer everybody something to eat according to their diet. It is polite to ask about special diets beforehand and order food accordingly. Most team members did not have any comments on the food.

## **5. Finance**

There is no consensus over whether co-design participants should get paid or not. In the DfAW project, advisors got paid for their time, but members of the User Reference Group did not. Team members did not express their opinions on payment, but one team member discussed the process of forming two user groups instead of one and the confusion this caused.

*“If project lead would have wanted us, to say right can we have the User Advisory Group in Newport and you come down and facilitate it there we'd have done that. I offered to do that. ... So we had to call that a participation group (User Reference Group) and that an advisory group just to make a distinction between the two but there shouldn't have been two there should have been one.” (TM12)*

This excerpt highlights why planning and adhering to the plan are crucial. If the plan is changed without everybody's consent, it will also influence the financial situation of the project.

## D) Impact

This section has two parts. It presents the findings regarding the impact the co-design project had on the project stakeholders and how the team members perceived the impact the users had on the design.

### 1. How user participation in co-design impacted the end result

The team members' opinions differed somewhat on this point, but generally the team members thought that the project would not have been the same without the contribution of the users.

*"I thought they were central to everything that we've done. There would be no outcomes, there would be no designs. ... Without their input we'd have had a product that is speculative and probably not very successful, so the outcomes, the research, the multiple dissemination that we've done it's all come from them hasn't it." (TM21)*

The team members agreed widely that user involvement was a crucial part of the design process.

*"I think it gave it integrity. It took it beyond and outside any other project about design, not any other, but most projects about design tend to center on the designers and what they think people want, but by keeping such as an active user group involved." (TM17)*

The following comment highlights the importance of testing the prototype with real users.

*“I think the impact was the opportunity that the final prototype could be tested with a walking group and it made a difference to their experience. Impact is all about how we can show something from a societal point of view or something from an economic point of view.” (TM22)*

Everybody agreed that involving the end users made a significant difference to the project.

## **2. How co-design participation impacted the team members**

Almost everybody I interviewed admitted that they had learned something from being a part of the co-design project. The aspects that team members said they learned about are diverse. They include the outdoor clothing layering system, materials, technology, shared language, specialist knowledge from other disciplines and the willingness to understand others. Team members said they had learned about being part of a multidisciplinary team and a co-design process.

*“So I think co-design offers an enormous amount of opportunity to give individuals a chance to blossom in many respects, because lots of people don’t know about design, they have not been exposed to it, and yet they buy it and use it every day you know with motor cars and whatever. ... I think the value that we all experienced on the project with the user group was evidence itself that it has a lot to offer.” (TM12)*

The following comment reveals that the impact on people comes from informing them about new products and future innovations.

*“I do think it has an impact on people and people do things like meet new friends and it's an opportunity to socialize, it's doing something different that you hope has some sort of positive impact as well. ... I would be saying the important thing to think about isn't just about designing a product for*

*now this is informing people and will be informing people in the future about things that they need to think about, and they need to take onboard how they maybe need to look at the next generation of clothing, or equipment, or whatever they're designing.” (TM13)*

Feeling useful came out as a point in several of the interviews. All stakeholders wanted to be useful and feel that the time they dedicated to the project was beneficial. This team member thought that some of the users felt very useful:

*“I think, like particularly some of them, I think they got quite a lot from the project because they felt they were being useful which they obviously were being really useful. Yeah I think that some people got a lot of satisfaction from being involved in the project.” (TM14)*

Other team members shared the opinion that the users had gained a lot from the process. In the following comment, one team member states that some users were proud of participating in the project.

*“I think they will be proud to have been part of it, and they will go away – I mean think how much they will have gained, all the knowledge that they can now share and share their own expertise to other people and that will, kind of, spread that knowledge. I think that has worked very well.” (TM15)*

In the following comment, one team member also discusses how the users enjoyed being a part of the project, and the need to feel useful.

*“I think they got a clear sense of enjoyment out of it, some people loved the air time, some people loved the social time, you can see that on the video recordings quite easily, the interaction. People in the workshops felt that they contributed to the design of products which could go some way in what was an exciting project.” (TM16)*



In the next excerpt, the team member continues that expressing gratitude towards the users is very important. They suggest that it is good practice to offer everybody recognition.

*“I think more could have been done to thank people at the end of the day and make them feel a bit more rewarded and recognised, because that is really important in a study, that somebody should be greeting them and giving them a warm hello, somebody should be thanking them individually when they leave at the end of the day, to thank them for coming and wish them a safe journey.” (TM16)*

One of the learning points for the team members was understanding the value of user involvement and adopting it for their work.

*“I think involvement has a broader impact as well. I mean you'd hope that some of the people, some of the researchers who have been involved in the project maybe will think differently, or at least will think do we need to involve people and if they do let's maybe do something different about it. Certainly people from the tech background who have been involved in other projects have valued it very much.” (TM13)*

Another aspect that came up was meeting other professionals, learning from them and being inspired by their knowledge.

*“One thing that I forgot to say that I'm going to say now is one thing that I'm most amazed about is...see it's really easy to forget this the amazing people I met like I used to find X so inspirational.” (TM14)*

This view was shared, and many team members mentioned the learning process. The team members also discussed the impact the project had on them.

*“Like it was good I learned lots but I think I learned more how not to do stuff rather than how to do stuff but then it was a totally new way of working for me as well.” (TM14)*

Some team members mentioned that they learned from the mistakes made in the project.

## **Part 2. Project partners**

This part looks at the findings from the interviews with the project partners. Part 2. looks at the partners' views on A) Co-design, B) Collaboration C) Setting and D) Impact. The findings are based on the interviews with the partners. There were several individuals, instances and commercial partners who collaborated with or advised the DfAW project during its course. I interviewed four partners who were involved with the project for longer periods of time.

### **A) Co-design**

This section is divided into two subsections that contemplate the co-design process in the DfAW research project from the partners' points-of-view. The first subsection presents the findings regarding the purpose of co-design, including the motivation for being involved in the DfAW project and how the partners ended up working in it. This is followed by the findings relating to the expectations and assumptions about the project, which highlight the importance of a shared understanding of the aim and the need for the project. The second subsection discusses co-design methods and how the partners perceived the different methods.

#### **1. Purpose**

The purpose of the project was obviously important for the project partners as well. Commercial partners saw a business opportunity in the project.

## **Motivation for involvement**

The four project partners were people who the project lead knew beforehand and asked to collaborate on the project. They all had a specific role depending on their profession and professional interest towards the project. I asked the partners how they got involved with the project, what their role was and what motivated them to participate. One of the partners had met the project lead in a conference, and they realised they had a common interest.

*“We found very similar interests and we started talking about how we could integrate the technologies, which was obviously clothing as well as the purely technical features.” (PP21)*

As a conclusion, the project lead asked all partners to collaborate on the project, and the motivating reason for them to participate was a professional interest in the project.

## **Expectations and assumptions**

When the project partners were asked what they expected from the project, they did not express clearly what they expected to happen in the project, but more what they expected from the outcome.

*“Well I expected that we would end up with some garments which were designed to make older people more confident in walking, because after all that's the nature of the project. I didn't have any expectations at all about the co-design privacies and that was not really a feature that I considered early on and it was only later that I became convinced of the importance of that kind of approach.” (PP23)*

Similarly, another advisor only answered what they expected from the end product.

*“Originally I had perceived it as an ideal if we could take a smart phone, take it out of it...or stripe it out of its case, throw the case away and build it into the clothing so that it was ubiquitous, it just disappeared into the clothing, but it was available to you. Obviously you had to be able to interact with it, yeah?” (PP21)*

Another partner described how being involved in the project changed their view on what users wanted, but they also did not exactly comment on their expectations of the project:

*“I started talking to the user groups and understanding their needs and was like really surprised when we did the first thing where they brought their clothes in and then we showed them the layering system. The garments that they wore weren’t what I expected at all, and it was a real eye-opener. ... This is really useful because we design in a bit of a bubble, like I said in my presentation it’s, there’s a lot of assumption that goes on as to what the consumer wants or needs.” (PP11)*

As a conclusion, the partners had some initial expectations for the outcome of the project, but they had not considered how they expected the project to take form.

### **Clear objectives and project scope**

One of the most crucial things in any co-design project is to understand the goals of the project. The whole team need to know the common goal, why the project is needed, and also the rationale for their individual job.

*“I think one question that I might have asked other people, who were called Project Staff, is - was the project necessary in the first place? Have we got a problem that we're trying to solve? And I don't think that question was ever asked, I think it was a jolly good idea and great fun to work on but we never asked the question - what problem are we solving?” (PP23)*

Another project participant takes it even further and suggests that the objectives should be set in an even longer time-scale.

*“Okay. I would say that you need to be able to work out what it is you’re trying to do, you need to have a strategy. What are we trying to do? ... It should have a strategy that goes at least 15 years, because if you’re going to try and make an impact with the research, the research will open up, and open out. ... It will produce new areas of new developments of research.” (PP21)*

The previous excerpt highlights how important it is to decide the objectives of the research.

### **Activity planning**

To a certain extent, co-design is an activity that evolves according to the users, but the findings also suggest that careful activity planning is needed to avoid overlapping and repeating previous tasks.

*“The only thing that I can think of is that I might have attempted to have shorter timescales. ... I didn't attend every workshop but some of them were quite well spaced out and I think sometimes the participants were having to relearn some of the things that they'd done previously. ... I recognise the difficulties of course of people volunteering and giving their time on a more frequent basis.”*

I asked: so, you think there was an overlap?

*“Yes, it was... things that had happened in a previous workshop, sometimes seemed to me to be being reviewed, whereas with a shorter timescale between the workshops that might not have happened. It's difficult to say of course.” (PP23)*

The previous comment brought up the importance of careful activity planning. However, another project partner found the planning very good.

*“I think they were very well organised. The majority ran to time. Sometimes it was a bit of shame when some of the users had to leave a little bit early because I felt that they were missing out more than anything else in sort of further discussion, which generally was what happened towards the end was sort of more general discussion. ... The food was good and it was quite easy to get to the University.” (PP11)*

The previous comment suggests that timekeeping is important and that it is a shame if everybody cannot attend the entire workshop.

## **2. Co-design methods**

One of the aspects to consider when deciding which co-design methods to use is the participants and the selection criteria applied.

*“No, I don't think that I can think of any other approaches (co-design methods). I was slightly concerned about how the participants in the workshops were chosen, not concerned, I think it was pretty random and I'm not quite sure how the people were recruited and what sort of thought was given to who should be involved.” (PP23)*

The selection of users might result in biased opinions and, therefore, it is important to consider the selection carefully.

## B) Collaboration

This section presents the findings regarding cross-disciplinary collaboration and the importance of clear and transparent communication. These findings indicate that a successful design outcome and user engagement require smooth collaboration between team members and project partners. The first subsection starts with findings about how the partners viewed their roles and responsibilities. The second subsection concentrates on the findings related to team building and the importance of the partners knowing not only other stakeholders and their roles and responsibilities, but also their personal aims and interests. The third subsection reveals the findings concerning communication and the need for a communication plan. The last subsection of the collaboration element presents the findings concerning shared language and the sharing of disciplinary knowledge.

### 1. Team building

The project partners had different views on team spirit. One of the project partners saw that the team was not very coherent.

*“The different parties didn’t actually understand each other from the discipline point of view or from a personality point of view. This is where programme management and project management is so important.”*  
(PP21)

From another project partner’s point of view, team spirit and collaboration were evident.

*“There was a good team spirit I think, certainly the team within Wales knew what was going on, the four people down in Newport were all well aware of it and there was a good team spirit, I detected that.”* (PP22)



In conclusion, the project partners saw the team spirit very differently.

## 2. Communication

If the project team in multi-disciplinary projects is spread across different locations, the importance of frequent communication is magnified.

*“The other thing, it’s not a criticism, what you’ve got to....one has to consider is the team is made up of individuals with different personalities and attitudes and because they’re split apart, that makes it difficult for communication.” (PP21)*

Another project partner also mentioned the importance of communication.

*“I can well understand the reasons for the choice of partners, but I think that that almost day-to-day, week-to-week contact was not there and I think that it would have helped to have a more local university dealing with both of those topics.” (PP23)*

The previous comment highlights that different geographical locations bring challenges.

## 3. Shared language

Shared language was one of the set goals for the project to aid cross-disciplinary collaboration. A glossary was one of the tools proposed to help communication.

*“Back to this common language thing, I think that was not as successful as it might have been, because one of the simple things that we could have done at the very beginning of the project was to get people to set out a glossary and just a list of names, terms, expressions, things like that and*

*ask for explanations of those terms and widely circulate that through the project base.” (PP23)*

The previous comment suggests that a glossary would have been an effective tool in developing a shared language.

### **Disciplinary knowledge and specialist perspective**

The DfAW project included two different parties, technology people and design people, who had different project approaches. There was a lot of discussion about how to get these parties to understand each other. The following comment suggests that there were some attempts to resolve this issue but these were never fully realised, and the disciplines never fully understood each other.

*“The difference between the technical side of the project, who wanted things immediately specified down to the last detail, and the other side, the design side ... have a very different approach and I don't think we ever got very, very close to reconciling those two ideas.” (PP23)*

Disciplinary education and perspectives are difficult to unravel, but enough consensus should be achieved in order to collaborate successfully.

### **Learning process**

One of the project partners described adopting the shared language as a learning process, where all stakeholders bring their disciplinary language to the group.

*“Well, I suppose it was like a learning process almost, ... and then by the end of the project, the terminology was just second nature. ... The shared language was very much a sort of a growing thing the whole way through the project. Different people that came in brought their own words that then got used amongst everybody else.” (PP11)*

Other project partners did not mention a learning process.

## Understanding users

Ideally, co-design gives the designer the opportunity to understand the user.

*“So I think definitely they have a use in co-design but I don’t think they will give you a solution to the problem. What they will give you is the problem and that might not have been something that was on your radar. ... All the problems that they have, you can listen to all that and then as a designer you can take it away and you can go, how can we solve this problem.”  
(PP11)*

In a co-design workshop, the designer can get direct information from the users to aid design.

## 4. Project Management

The DfAW project had a relatively complicated project team structure with different work packages. Leading a large research project is a complicated task and in the following comment, it is suggested that leading the whole project and one of the work packages was a huge task, and there should have been separate team members to lead one of the work packages and the whole project.

*“I think we should have appointed a project manager who was separate from the leader of one of the work packages. I know that we put in money for that and then it was crossed out, but I don't really see how anyone can be effectively expected to run a major work package, which was a full time job for other people, and manage the project at the same time.” (PP23)*

The previous comment suggests that making correct decisions about the project team structure and the project management team is crucial for overall success.

## Leadership of people

A significant success factor in running an effective project is to find the right people for the team and to support them, enabling them to complete activities within their sphere of interest, which they are more motivated to complete.

*“You get people, recognise their skills and recognise their potential and get them to go the extra mile and in so doing they grow experience they grow the skills and the team grows its skills.” (PP21)*

This team member continues that the effective leadership of people requires being interested in the team members' personal challenges.

*“It's human resource management, it's about how you manage people. You need to be able to pick up subtle, subtle signs. You need to be able to present an image whereby they'll come to you. ... It's about interaction between people. If there's a gap it's normally in the people.” (PP21)*

The leadership of people is crucial for successful co-design projects, and communication seems to be one of the most important factors.

*“If you're teaching as a true co-design as I would understand it where everybody is on the same level then you almost need to circulate in some manner, I don't know how you would do it, but you almost need to make sure that everybody is constantly aware of each other's pressures, concerns. ... . It's just keeping everybody aware of each other person's role in the team perhaps.” (PP22)*

As the above comment suggests, keeping everybody aware of others' roles, responsibilities and deadlines is hugely important.

## C) Setting

This section presents findings about the setting of the co-design workshops from the partners' point of view. The section is divided into five different sub-themes, which are Location, Equipment, Time, Hospitality and Finance. These five practical aspects need to be considered before the user involvement starts and developed during the co-design process.

### 1. Location

One of the project partners mentioned that the geographical location brought extra challenges to the project.

*The third one, again I've mentioned before, is this geographical separation, which I think didn't help the project. (PP23)*

The different locations certainly made communication more difficult. The results of communication were presented in the communication section.

### 2. Time

The planning of the schedule was mentioned by one of the project partners. It was suggested that the time intervals between workshops should be shorter and equal in duration.

*"The only thing that I can think of is that I might have attempted to have shorter timescales. ... I didn't attend every workshop but some of them were quite well spaced out and I think sometimes the participants were having to relearn some of the things that they'd done previously." (PP23)*

Another project partner in an earlier comment had noticed the challenge of finishing on time, and also that some users needed to leave before the agreed time.

## **D) Impact**

This section is divided into two parts. It presents the findings regarding the impact the co-design project had on the team members and how the team members perceived that the users had impacted the design.

### **1. How user participation in co-design impacted the end result**

Everybody I interviewed agreed that the users influenced the project in some way, and said that it would have been completely different without the users.

*“I think that, as far as I'm concerned, that the public involvement that I'm familiar with definitely influenced the design and the outcomes of the project. ... The group entered into the spirit of the co-design process and were able to make good contributions to the project.” (PP23)*

It was more challenging to define how the users influenced the actual design features.

*“That's not to say that some of these things that came out from that group were not already in the manufacturer's mind, but there was definitely, as far as that group was concerned, picking out of features from one manufacturer's garments to another, which were good, which were bad and should be incorporated. So yes, I think they did have an influence.” (PP23)*

One project partner joined the users in a few workshops, and she felt that she received a lot of information to guide her design. One of the things were the colours and other details.

*“Well, it’s kind of access to things so you couldn’t put anything anywhere where it was going to be difficult to get to, so where we found that age group might have limited mobility in their shoulders there’s no point in putting something that you have to sort of contort yourself to be able to get to, but by adding articulation into the garments was really helpful because then it allowed them to move in them without the whole garment moving with them.” (PP11)*

The project partner was convinced that the participation of the users made an impact and without them it would have been different project.

*“I suppose it’s not a failsafe by having the user groups involved but it takes away the ‘I assume’ and the ‘I’m sure that they would’ which are phrases that come up in like sales meetings and design meetings all the time.” (PP11)*

Overall, the project partners believed that the participants had a definite impact on the end result.

## **2. How co-design participation impacted the people**

A very clear finding from the interviews was that the users learned a lot from participating in the co-design project.

*“The user group learnt an enormous amount, I think, both about the technicalities and about working together. ... I think that participants in this project, the project employee side, if you like, learnt quite a lot about*

*working together and some of the frustrations in not understanding exactly what it was that some of the processes.” (PP23)*

I asked: do you think how this feeling of frustration could have been avoided?

*“I think an independent project manager would have done a lot of good in order to try and corral the whole ... to try and collect together the whole thing that we made and the difficulties associated with it, all the technical bits as well.” (PP23)*

It was also stated that the impact was limited to those who were involved in the project, and that any broader impact was not apparent.

*“I think it's had an impact on the people who were the user group, I think the impact there is again a deeper understanding of some of the clothing and a deeper understanding of some of the issues that we're not familiar with.” (PP23)*

The benefit for the users who were involved in the project was to understand their activity and gear better. It is the same reason why users were motivated to join, and the interview answers reveal that some learning became evident.

*“Well, I think it definitely improves their experience of their activity because they now know that solutions exist to problems that they didn't know that they had, which is quite funny.” (PP11)*

As a conclusion, the members of the public were thought to have learned a lot about their equipment, which was seen as being beneficial to them.



## Part 3. User Reference Group

This part looks at the findings from the interviews with the URG. Part 3 looks at the URG members' views of A) Co-design, B) Collaboration C) Setting and D) Impact. Eight members out of the 10 from the User Reference Group were interviewed.

### A) Co-design

This section has two subsections and it looks at co-design in the DfAW research project from the User Reference Group's point of view. The first subsection presents the findings regarding the purpose of co-design, including the motivation for the involvement and how the URG members ended up participating in the DfAW project. This is followed by the findings relating to expectations and assumptions about the project. The aim of this subsection is to reveal findings about the importance of a shared understanding of the aim of, and of the need for, the project. The second subsection discusses the co-design methods and how the URG members perceived the different methods.

#### 1. Purpose

One of the URG members phrased the need for co-design very well when stating that designers need to approach users to find out what kind of design is needed and why. The following comment encourages companies and designers to involve their users and to enquire into what they are looking for.

*“The proposal I have is when anybody is going to design something you need to actually get it over to the people why you are trying to do it in the first place.” (URG24)*

Several members of the public were astonished that co-design is not common practice and that users are very rarely involved in the design process.

## Motivation for involvement

The findings suggest that the users were often personally motivated to become involved in a co-design project. This motivation was related to their interest in either their walking hobby, the clothes needed for the activity, or health reasons. This is particularly applicable to public involvement in research which intends to engage people who have characteristics or experiences of interest for the study.

The purpose of the project and designing clothing created lots of perceptions. Many users were interested in functional outdoor clothing and especially in wearable technology. One of the ladies in the User Reference Group described that designing functional outdoor clothing made a difference in her interest. This user clearly thought that involvement in research was a meaningful activity.

*“Well I came to the start of the course, well when I came I thought I don't want to go to this I'm not interested in fashion, it's going to be dead boring, but I'll come and see and I found it interesting because it's not fashion. It's producing garments that are sensible.” (URG12)*

In the above quote, she states that it was especially the DfAW project topic, outdoor clothing for walking, that drove her interest in the project, but that she would not have been interested in fashion. This highlights that it can be a relatively narrow niche that catches a user's interest, and it needs to be related to their interests.

When asked why they joined the process, most mentioned their interest in walking and the clothes they need for walking. Users also stated that one motivator was to learn more about functional outdoor clothing and technology. One of the User Reference Group members explains this combination of wanting to learn and to help with design development:

*“So as I'm a walker. Well I don't walk as much as I used to walk but I like to walk – obviously we use clothing of this type and we're interested in:*

*number one, learning more about it and to be able to contribute to the work really; to the research and help out with the design and hopefully come up with something phenomenal at the end.” (URG23)*

The findings suggest that there were also other personal reasons apart from learning to join an interesting co-design project. The product under development could be something that users needed, and they wanted to contribute to creating a more suitable solution. A few users stated that it was difficult for them to find the right size clothes and that was their main motivator for joining the project. They felt that their size or body measurements caused difficulties when they were trying to find appropriate walking clothing. Both very small sizes and large sizes were mentioned to be challenging, and participants thought that they could influence this in a positive way.

*“I did want to say, well look there are people out on the mountains who are only 5ft and some are wide with it, some are not, most are not I think a third of women I see out are under 5ft 3in but the way that clothes are designed doesn't allow for that. That was a real point of mine - there are small people.” (URG12)*

As the previous excerpts highlight, the URG members were keen walkers who were interested in improving their walking gear and who were curious about participating in the co-design process.

### **Expectations and assumptions**

Although the users received a participant information sheet, they commented that they did not know what the project they were joining was going to entail. When the participants were asked if they had any assumptions or perceptions about what the project was going to be like, most of them answered that they did not and they joined from pure curiosity. Many User Reference Group members just signed up for body scanning and then were pulled into the project, as the following comment suggests.

*“I suppose I didn't think it was going to go on for such a long time or that there would be so much involvement on my part but that's fine I quite like – I don't mind talking – putting my opinions.” (URG13)*

When I asked them if they would have liked more information about the project and involvement, they thought that it could have been useful, but not crucial for their involvement.

*“Possibly but it's alright I don't have to know details in advance before I get involved in things – it's been interesting and I like meeting everybody.” (URG13)*

The following comment is along the same lines as the previous one. The answers also reveal that nobody knew how long their involvement would last.

*“I just went along initially and I had initially had the body scan and I didn't realise how much further the whole project was going, as far as I was concerned.” (URG22)*

When I asked whether he would have appreciated more information on what activity he was about to engage in, he answered yes, maybe, if he had not been interested in the subject of walking and outdoor clothing; but because he was, it did not matter. So in this case, information was not the priority in securing his involvement. Similarly, most of the users did not have a clear picture of what to expect from the project. Another URG member stated as well that he had no conception of what it would be like.

*“I had absolutely no idea. I did rather think it would be more physical you know that they would be testing you running on a treadmill and testing you, but it wasn't like that at all – no I had no idea what it was like – absolutely none.” (URG21)*

Most of the users in the User Reference Group did not state any expectations for the project, and they joined open-mindedly due to their interest in the topic.

### **Concerns and fears**

The findings suggest that getting involved in a new experience can be exciting for participants. This research study and the DfAW engaged older users. It needs to be recognised that the fears and concerns that older people have can be different from those of younger people. One example of this is unfamiliarity with the internet. When they leave their comfort zone, they might need some encouragement and enough information to be confident enough to make a decision to join a new group and a co-design project. Joining the research project or co-design process may cause some concerns and worries. These worries can range from what is expected from them and getting along with new people to how their involvement may affect their privacy, i.e. how the results are published. Here one of the User Reference Group members describes how he felt he did not fit in with the professionals and that collaborating with them made him feel out of his comfort zone:

*“Very scary to start with, there were a lot of designers there and I'm not in the same world as them, but when they explained the first two probably workshops that we got into and I understood then what was going on, why it was made this way, why it was not made that way and things like that and then it was quite interesting.” (URG24)*

In the following interview excerpt, one of the URG members describes how he found the scanning unnerving.

*“So I think some of the people were a little bit scared of what's going to happen, some were a bit embarrassed of what their body shape was like and I think there's a little of that going on.” (URG24)*

A very common concern is self-doubt about whether they have anything to contribute. The below comment addresses this concern.

*“I must admit first of all when we were asked by the leader of our walking group, we were told that we had been invited along to participate in this programme, we talked about it and I did think possibly that I wouldn’t come along because I thought, oh gosh, I probably wouldn’t have anything to contribute, and then it was explained that it was about design of clothing for older people.” (URG11)*

When she was assured that she could make a meaningful contribution, she felt happy to join the project. This leads to the finding that users need to be convinced that they have something to give, because of their experience in the researched topic, and that they do not have to be professional designers.

*“I was very pleased to be involved in that because I thought, well that could be marvellous because I also got to understand that it wasn’t simply about clothing to do with our walking specifically, it was also to be clothing that could be used in general urban life that would be smart wear really. ... I did think that if there was any input I can make into that I thought I would like to have a go, so I did get involved.” (URG11)*

Joining a research project or co-design process can also be intimidating or generate anxiety. Some of these feelings can be caused by a perception of under-education versus the professional researchers and designers, and the anxiety of giving an opinion in an expert group, coupled with the unusual setting of a design activity.

### **Clear objectives and project scope**

One of the URG members thought that the workshops were well planned.

*“Each particular workshop seemed very well planned, you know, with sort of lectures and then the workshops were, we were given plenty of time between, time for discussion, time for feedback. I’m not sure really it needed to be dictated for what project lead and the group needed for us rather than for us to say how long we needed.” (URG11)*

The previous comment lists some key elements of good organisation; that there is time for breaks, time for discussion and time for feedback. The following comment raises criticism with respect to the planning and facilitation of the workshops.

*“I think towards the end we had sort of petered out in the afternoon and don't quite know what we're doing, unfortunate, I don't think its a design fault it's just the way the course has been structured and going and of course all the staff have got work to do as well.” (URG12)*

The previous comment also refers to the subject covered in the next section: activity planning.

### **Activity planning**

The importance of continuity in participation was also expressed by one of the users, who wanted a logical progression of new material in the study.

*“The problem here is that you have had a changing group of users and that is very difficult to work into the structure which really ought to be defined at the beginning and that is hard because that's where you want it, you want to meet fairly regularly, very clear structure, aims and objectives, outputs each meeting, so you know where you're going.” (URG12)*

On the other hand, it was also seen as very useful that, in the evaluation stage, the final prototype was also evaluated by the User Advisory Group, who had not been involved in the co-design workshops and therefore had less bias.

## 2. Co-design methods

The users were surprised to hear that user involvement was not standard practice in all design.

*“I assumed that anyone who was designing anything would consult a user group at some stage. It had never really occurred to me before that you wouldn't, it is so logical to do that.” (URG14)*

Several users attended a series of workshops, and some managed to attend all of them.

*“We attended various workshops where we have looked at the design itself, we have looked at colour, we have looked at aspects of garments which would be helpful for the older person who wants to remain active.” (URG14)*

I asked the users which workshops they attended and what they remembered of them.

*“Several workshops, there was one on colour and fabrics and looking at trousers and jackets, looking at the designs and deciding what was practical and what wasn't, what would work and what could be improved and so that was good and also I had a walkabout with the shimmer and the technology which didn't work initially.” (URG13)*

I asked: what did you think about that?

*“Well I thought it was quite fun really and I can really see the value in older people having these sort of gadgets so it's really developed my thinking about the use of gadgets for measuring/monitoring the heart. ... I'm*



*interested in breaking down the barriers that people perceive about taking exercise when they're older – it's about keeping fit.” (URG13)*

Most of the users who participated in the workshop and remained until the end of the project found the co-design workshops both interesting and fun. The next sections present the specific co-design methods.

### **Show and tell**

The ‘show and tell’ method consisted of users bringing their garments and then discussing them, what they liked and what did not work so well.

*“We were all invited to participate and bring along a very useful, functional item of clothing or accessory, which I did. I can’t see that there has been any major change in the process, throughout the time I have been involved with it. I have been asked my opinion on lots of things, I have participated in lots of things, I have given my opinion and I don’t see that anything has changed since then.” (URG14)*

The next section presents the findings of the method of looking at outdoor brands’ latest garments.

### **Evaluating the existing garments and fabrics**

In the first three co-design workshops, mornings were spent listening to users’ experiences of their current outdoor clothing, and in the afternoons, the new branded products were introduced to them. With the garments, they were given an evaluation sheet, where they were supposed to write their opinions of the garments. One interviewee stated that they felt overwhelmed by the task, and had difficulties keeping up.

*“There were times when we brought our garments in and there was a whole pile of garments on the middle tables and we were all around the*

*tables ... we were supposed to assess each one, either each color, each texture, whatever it was and sometimes it was a little bit disorganized if you like, in that sense, but maybe it can't be done any other way." (URG11)*

Learning about the different aspects of fibres, fabrics, the layering system, functional outdoor clothing and wearable technology was stated by many users to be positive in the workshops that they joined. Various users also stated that they appreciate their clothing more now they know how it is manufactured.

*"I thought it was an absolutely marvellous idea to get us to number one all of us look at the various fabrics, the availability of bonded fabrics for instance doing two functions, you know that sort of thing, I thought that was just amazing because I didn't really realise things like that existed. ... The fact that you can actually produce different textures to give various patterns and designs I thought that was extremely clever." (URG11)*

The next comment also reflects on the usefulness of looking at the new fabrics and clothing.

*"Well basically we were told to come up with some ideas, which is very hard if you don't belong to a system that designs or you don't know the cuts, you don't know fabrics, you don't know anything. So it was very good when everyone was there and they all said 'right, pick a fabric you like, not so much the colour, pick the fabric. We'll tell you if it will work for that'." (URG24)*

The URG enjoyed learning new things from the clothing and fabrics.

## **Last meeting of User Reference Group**

The DfAW project had two user groups in two different locations. Therefore, there were also two concluding meetings. The evidence suggests that ending a co-design project properly is as important as starting it properly. This is defined as having a clear ending where the results are shared and evaluated by the stakeholders, and everybody is thanked. The concept of the last meeting was to complete an evaluation for the designs followed by a group lunch.

The agenda for the meeting with the User Reference Group was too ambitious as the project leader had the final book chapters to write, and she still wanted to get additional results from the group.

Not all of the prototypes were ready by the official end of the project, and the users went to test them on a walk the following autumn. The users reported enjoying the walk and having a good time. Although it was completely voluntary and post the project's end, the users wanted to participate in the walk. By utilising more careful planning, with only the walk and lunch in the last meeting, a more appropriate closure to participation could have been achieved.

## **B) Collaboration**

This section presents the findings on cross-disciplinary collaboration and the importance of clear and transparent communication. These findings indicate that a successful design outcome and user engagement require smooth collaboration between team members and project partners. The first part starts with the findings of how the partners viewed their roles and responsibilities. The second section concentrates on the findings from team building and the importance of the partners knowing, not only the other stakeholders, their roles and responsibilities, but also the other stakeholders' personal aims and interests. The third section reveals findings concerning communication and the need for a communication plan. The second part of the collaboration section presents the findings concerning shared language and

sharing disciplinary knowledge. This collaboration section ends with the findings concerning project facilitation including leadership, project management and the importance of change management.

## 1. Roles and responsibilities

The roles and responsibilities of the team remained unclear to the user group.

*“As a group you worked together well but I don't think I can comment on how well the different disciplines fitted because wasn't until really towards the end I worked out people's disciplines and even then I didn't know them all but everyone seemed to know what they were doing and worked well with each other there didn't seem to be any problem about it.” (URG12)*

When the URG members were asked how they saw their role and job description in the user group, they had a variety of answers. Several saw themselves as users or participants in the project and described their age and walking hobby, because that was the target group. A user group participant, focus group participant and end user were probably terms the research team used and the interviewee answers reveal that members of the public had also adopted the terms.

*“I'm a participant, as a user-group participant, because I was in a walking club and somebody asked me if I wanted to get involved in the project with the older walkers.” (URG22)*

URG members saw themselves as users quite systematically.

*“My role in this was as – I am a walker, I was a hill walker but not so much now and therefore I would be the user of the garments and it was a chance to comment on them and see what changes could be made and I was interested in what changes other people wanted to make.” (URG12)*

In the DfAW project, the prototypes were made to three male and four female sizes matching to the BMI profiles of national size charts. This division separated the focus group, when people categorised if the clothes were made for them or not.

*“I suppose I am an older link for the project and I was chosen as one of the models for the clothes.” (URG13)*

*“I was just a participator because I didn’t have any clothing to fit me to try.” (URG11)*

Two men in the focus group described themselves as guinea pigs, which helps to describe their understanding of their role.

*“In the process I was one of the guinea pigs being used. ... So I went along, my wife and I, met a few people - a few strange people, never bumped into designers and people like that before. ... So every time that project leader wanted something we'd go up and she'd either look at me or measure me or ask me something and then they decided to get the group together.” (URG24)*

Here is another example of a user considering himself as a guinea pig, although with some element of collaboration.

*“I'm involved in this project as an older research advisor – rather a fancy title a bit of an upmarket guinea pig really – rather like a lab guinea pig but a slightly more cooperative and intelligent one but that's really it. My job basically is to give my opinions and they are just opinions, on the design of clothing and also on the use of clothing and an interface with electronic stuff that's basically it.” (URG21)*

The URG members were also asked if they had any experience in design or if they had been involved in a participatory design project previously. I also asked them if they had any experience in research or multi-disciplinary collaboration. A few participants had been involved in design, developing either garments or musical instruments. One of the members of the User Reference Group had been involved in multi-disciplinary research, but not involved with designing. There were also people who had had no experience in research, co-design or multi-disciplinary working, and the project was a completely new experience for them.

*“No, nothing at all, this was my first adventure into the brave world of being a guinea pig.” (URG24)*

As a conclusion, most of the users did not have any previous experience of co-design projects and the DfAW project was highly influential in their view of how co-design projects function. As presented in the previous sections, they did not have a very clear picture of their role or responsibilities as an end user and as a co-design project participant.

## **2. Communication**

Many of the URG members did not mention anything specific about communication, but one of the users raised some positive aspects.

*“I think the variety of backgrounds is an enhancement to the project because different people have different views and look at things from different aspects. And the overall communication and the bringing together of these different backgrounds is something that enhances the project, yeah. ... The participants must have an interest in what you’re involved in, the transparency in the research project and an involvement where people’s opinions are appreciated and taken on board.” (URG22)*

The previous comment highlights the transparency of the project. It is also important to communicate the aims and progress of the project with the users.

### 3. Shared language

Different groups have distinct ways of communicating that an outsider does not necessarily understand. In addition, a specific professional group with a shared language may not intuitively open up to an outsider. Therefore, it is vital for the professionals to consider their approach to verbal messaging to ensure all groups comprehend the topic.

*“I think communication is a separate skill. ... So I think when a project is being organised I think there should be some understanding that this is going to happen, that people need to rethink their language and to be prepared to explain and not use terms – without being patronising of course.” (URG13)*

The success of a shared language can be defined as the concept of an idea being shared and understood in the same context by all involved. People from varying backgrounds and disciplines use different lenses when they observe the world. This means that when we have a different background, history, upbringing and conditioning, which have affected the formation of our different values and priorities, this also affects the way we work, along with the vocabulary and terminology used. A shared language can be created in different ways, but my opinion is that people from different backgrounds and disciplines should explain where they are coming from, their common terminology and ways of working in a clear way in order to ensure a common understanding.

From my perspective, one of the most effective descriptions of a shared language is a concise formulation by one of the User Reference Group members. He suggests that:

*“Shared language to me would mean a bit like Esperanto.” (URG23)*

I asked the users if they found the specialist language difficult. There was a varying degree of difficulty expressed.

*“I haven't found it difficult, I had to think sometimes at the beginning – that is what I think they mean and does it fit as the ideas develop – if not I have to modify it but on the whole I could work with it. No serious problems.” (URG12)*

Users thought that the terms were explained to them well.

## **Glossary**

I asked the users if a glossary could have been helpful.

*“So that's an idea, yes. Just a short - I don't know - say, 50 words, something like that.” (URG21)*

Some people said it would have been useful, while others thought that it could have been daunting.

*“I think if people were faced with a large glossary of terms, it might be off-putting but as and when you're using the terms and you're seeing what they mean in a practical sense, then it's easier to understand and easier to take onboard.” (URG2)*

There were several comments stating that a glossary would not have been necessary.



## C) Setting

This section presents the findings about the setting of the co-design workshops. The section is divided into five different sub-themes: Location, Equipment, Time, Hospitality and Finance. These five practical aspects need to be considered before the user involvement commences and is developed during the co-design process.

### 1. Location

Universities may appear to be intimidating and complex locations which are difficult to access and navigate. The Welsh User Group meetings were held mainly at the University of Newport in Caerleon, which has a complex layout.

*“I also can't stand this building I liked it from the outside when it was built but I keep losing my way out.” (URG12)*

There were also users who were more familiar with the institutional layout.

*“No, I am familiar with universities, having worked in them myself, so this wasn't a problem for me, coming to such an environment and I was keen to help the project.” (URG14)*

As a conclusion, the location is important and preferably should not add additional orientation challenges to the users.

### 2. Time

Users in both user groups stated that despite the fact that they are retired, they are still very busy, and that they do not have time to waste. Participants highlighted clear agendas and the structure of meetings as the key factors to ensure efficient time use.

The following comments summarise clearly that participants can sense if the programme is not carefully planned.

*“Well I think first of all the first one you've got to get right is the overall structure of that day, you've got to get that menu right and when you're introduced to people, from the time that starts to the time you leave, you need to get that structured.” (URG24)*

One of the users stated that careful planning is also very important from a time management perspective. A URG member held a supporting view:

*“I did find as I said early on the sessions sort of wound down a bit in the afternoons and I think the organization could be tightened on that so that you know what you're doing and why you're doing it.” (URG12)*

Workshops often ran over time and exceeded the proposed finish time, with overruns ranging from ten minutes to almost an hour. Several participants indicated that this was not ideal because they had planned their day around a predefined schedule and then felt bad when they needed to leave at the planned time, but prior to the workshop completion. It is incorrect to assume that retirees have significant amounts of spare time; the reality is often the opposite. In this regard, one of the focus group members described how older people can be very busy:

*“I think it is just time really, the very fact that the people here, the research was geared really towards an active ageing group, if they are active they are not sitting at home with time on their hands.” (URG14)*

The previous and following comments both suggest that the time planning activity is very important. The length of the workshops should also be carefully considered.

*“I would say from the people that I have spoken to about this, the comments were that a whole day to give up was a lot and most people would prefer a morning or an afternoon session and I think even if you say started at nine and finished at two.” (URG14)*

One URG member brings up an important point about ensuring that time is correctly allocated for each aspect of the co-design workshop.

*“I think there was only one workshop was a bit chaotic and that's because we ran out of time. ... But that's a time thing, the structure was there, if you looked at the structure for the day it was there but we just ran out of time.” (URG24)*

Also, to ensure a clear structure and avoid chaos, the setting of overly-ambitious goals for one workshop should be avoided. Failing to finish on time might negatively impact participants. One of the users described how he needed to change his plans because the workshop ran over.

*“So, it's a matter of knowing how long you're going to be there beforehand so you can make any arrangements if necessary.” (URG22)*

The following comment raises the importance of keeping to schedule.

*“I think the only thing that happens is we run out of time, because if you think, they want to fit so much in that it just runs out of time. ... When you think of a day you can only absorb so much information, so if you're there for eight hours you tend to drift off after four or five. So yes, if you had half a day of a workshop and you've done three a week, I think you would be better than doing two workshops at full days.” (URG24)*

In the following comment, one user mentions the hampering impact of having a time allocation that is too aggressive:

*“I think on a corporate side of it, there's no point jamming too much in for one day, because people will not absorb it, they can't. ... And it don't matter what they said to you next, you couldn't absorb it, it was gone, but if you'd have broke for a tea or coffee, whatever, a little chat, walk around the block, come back and then you can. So I think the structure in the day is definitely to have plenty of breaks.” (URG24)*

There are several points of interest in the previous comment to focus on. Firstly, trying to achieve too much in one workshop creates a chaotic feeling for participants, when the tasks are rushed. Secondly, a schedule that is too tight drains people’s energy and leaves them feeling exhausted. Thirdly, there is only a certain amount that people can absorb and contribute to in a single sitting. Most people need time to let new learnings sink in so that they can build on them. Finally, having enough breaks for people to relax and socialise with each other creates a pleasant, relaxed atmosphere and produces a more enjoyable experience. As a conclusion, planning is key to having successful co-design workshops, and for the project as a whole.

### **3. Hospitality**

Catering was seen as a very important part of the experience.

*“I would say and it could be that one of the draws is always going to be refreshments, it could be that you did the morning session and then had lunch, you could actually dispense with coffee perhaps, it depends how far people have come, or do a lunch and then go on to the afternoon session, that is the only comment I have got to make about that.” (URG14)*

The URG members were very happy with the catering, and many of them expressed gratitude for the opportunity to be part of the project.

*“I have felt very pleased to be included and quite privileged really to be given the opportunity. I have thought that things like the catering were marvellous, I really do, I think there was lovely food that was suitable for all, beautifully presented etc and very nicely done. Absolutely no complaints at all.” (URG11)*

As a conclusion, all of the URG members expressed a high level of satisfaction from being involved in the project.

## **D) Impact**

This section is divided into two parts. It presents findings regarding the impact the co-design project had on the User Reference Group members and how they perceived that they had impacted the design.

### **1. How user participation in co-design impacted the end result**

I asked the users how they viewed their impact on the end result.

*“Yes, I think so because it was quite a democratic thing as well, I do think we all realized that we were quite a varied group, background and everything, personality, therefore there was quite a bit of diversity in our choices – colours, everything.” (URG11)*

The following comment also mentions the democratic process which the users felt they had been a part of.

*“As a co-design project, everyone involved had an impact and input. And there’s certain things that I’d like to have had differently. With regard to the base layer I would like to have had sleeves on it for the winter but it’s a democratic process and the majority rules so, we had sleeveless base layers.” (URG22)*

Some of the users were confident that their participation had made an impact while others were not sure.

*“I had a bra made for me and I suppose because I've had the fitting of that and the wearing of that I've contributed yeah so I made an impact with that and also when having fittings for the jackets and the trousers and the inner layers – so I think when I've talked about it that it's had an impact – so I was told anyway.” (URG13)*

Participating in a design process can be an empowering experience.

*“Yeah, it just sort of seemed to have an impact to think, wow, you know, fancy that, that’s gone through all those months and it’s gone to somebody’s workshop or whatever and it’s actually been cut out and put together and there it is. I think X was wearing it, or whoever it was, and I remember thinking, it just sort of struck me as pretty empowering.”*

Generally, the members of the URG members felt that they had made a difference.

## **2. How co-design participation impacted the URG members**

The data suggest that participating in the co-design project had a definite impact on the participants. The positive impacts which the members of the public, users and advisors named were empowerment, gaining new knowledge, meeting new people, a

feeling of synergy from working with others and a new enthusiasm for their walking hobby.

The most common way to evaluate the impact on themselves was to determine if they had made a contribution to the design or not. When users felt that they had made a difference, they felt empowered by their contribution. The result gave them the feeling that their opinion had mattered and their voice had been heard. Some users felt empowered by being a part of the project and were sure that they had made a contribution to the design.

*“It felt quite empowering and things like the first time they tried on the prototypes, ... I saw the shape of the hood and I remember thinking, oh I remember drawing those things, and it just seemed, you know, it just must be marvelous, I have a feeling that’s what it must be like for an architect when they do a design and then they see it as a building.” (URG11)*

The previous comment highlights the empowering moment when the users saw their design on real garments.

### **Gaining new knowledge**

Many users mentioned that they had learned new things.

*“Yes I've learned a lot and I've talked about it with friends and family and so I think it's a talking point and it builds awareness about taking exercise and people are generally interested.” (URG13)*

The following comment reflects a similar view to the previous one. Some of the users also thought that the new knowledge was useful in their everyday lives.

*“Well I do feel that the project, as I was saying earlier, has helped me that concern because I would never have referred to it as the mid layer, the baser layer and all of that so it does mean now.” (URG1)*

Some of the users even made changes to their wardrobe because of the project.

*“The main thing, the chief thing for me which was evident from very early on in the project was the advancements made in smart textiles, in synthetic fibres ... My wardrobe is still basically made up of natural fibres but I do now consider synthetics, particularly paying regard to their breathability, their washability, their lightness for ease of transport and things like that so certainly for holidays I would be taking with me some garments that were easy care and synthetic.” (URG14)*

The following quote also highlights the change that the project made in the users' thinking.

*“A big effect it had on me: I have always been a bit of a believer in natural fibres. ... And it has really discovered that man-made fibres now are at least as good as, or better than, the natural fibre; that is one thing that has certainly come through absolutely clearly to me. It is one thing that I have learnt.” (URG21)*

The previous comment is an example of the learning process that the URG members experienced.

## **Meeting new people**

Users were happy about meeting new peer walkers as well as the team members.



*“All I can say is that all the people who have been involved in this process have been very nice to meet and particularly the students have been wonderful company and very diligent and well done you.” (URG14)*

Although some of it may be accounted for by British politeness, all of the interviewed users and advisors thanked the team for the opportunity to be a part of the project and sounded glad that they participated.

*“I would like to say how much I enjoyed the project; how much I enjoyed the company and yourself and, of course, all the people.” (URG21)*

The users stressed that they had enjoyed the project and felt privileged to part of it.

*“All I can say is that all the people who have been involved in this process have been very nice to meet and particularly the students have been wonderful company and very diligent and well done you.” (URG14)*

One of the biggest benefits of a co-design project is to empower users. The users reported that they enjoyed learning new things and meeting new people.

*“I've had some wonderful time with people and I've really, really enjoyed it and thank you very much. ... It's opened up a whole new world for me. ... I think this type of research and this market for older people is going to be expanded and I think, and I hope sincerely, that all your hard work and all the research that you've done is taken up and is used because I think it really is valuable.” (URG21)*

Many users emphasised how much they enjoyed participating in the project.

## Part 4. User Advisory Group

This part looks at the findings from the interviews with the User Advisory Group (UAG). It looks at the UAG members' views on A) Co-design, B) Collaboration C) Setting and D) Impact. Ten advisors out of twelve were interviewed for these findings.

### A) Co-design

This section has three subsections and looks at co-design in the DfAW research project. The first subsection presents the findings relating to the purpose of co-design, including the motivation for the involvement and how the advisors ended up working in the DfAW project. This is followed by findings regarding the expectations and assumptions about the project. The objective of this subsection is to present the findings about the importance of a shared understanding of the aim of and the need for the project. The second subsection discusses co-design methods and how the advisors perceived the different methods. The third subsection looks at the findings about the facilitation and moderation skills employed in the co-design workshops.

#### 1. Purpose

The UAG members stated clearly that the purpose of the project was crucially important. However, the UAG members did not fully understand their role, which becomes evident in their interviews. I asked them why they did not bring this up during the project, and they felt sorry that they had not. One of the most important elements in user involvement is that users feel that their participation makes a contribution. This is highlighted in the following comment.

*“I think, when we first joined, we were a little bit confused as to what our role was and I think, if we had a definite task to do, I think we felt happier that we were being valuable. I think, at the back of our mind sometimes*

*we thought are be contributing anything at all here? Is what we are saying of any value?" (UAG21)*

The following section presents the findings on motivation and explores why people wanted to participate in the project.

### **Motivation for involvement**

In general, the motivators for participation in the project were very similar in the UAG and the URG. Users had an interest in expanding their knowledge about their hobby or equipment. One UAG member especially mentioned health reasons as a motivation, because she had had problems with her heart and the possible help from smart clothing sparked her curiosity. Participants were interested in how wearable technology could give them health benefits, by losing weight, getting fitter or enhancing their walking hobby.

*"It was just pure curiosity, I couldn't imagine, because it talked about monitors and things like that built within the clothing, how does that work? As somebody who has heart surgery, which I had and was recovering quite well from that, maybe this would be of interest, maybe it wouldn't, I would like to find out more." (UAG11)*

Her view was supported by another UAG member, who also was interested in learning new things and participating in the design process.

*"I was intrigued. I wanted to know because we were going to be told at the first meeting what it was about. And it sounded interesting. I liked the idea of perhaps being a participant in something new, that the general public were having a say in design and technology and I wanted to know more and wanted to be involved." (UAG16)*

Several UAG members stated that they felt good about the idea that they were able to participate in research and improve walking clothing for the benefit of older people.

### **Expectations and assumptions**

This section looks more closely at the expectations and assumptions of the UAG. Research ethics mandate that participants of a research project have the right to get an information sheet that explains the nature of the project. To make sure that the participants understand the information sheet and know what they are going to be involved in, they are asked to sign a consent form. Although this procedure may not be obligatory in commercial co-design projects, it is good practice and can avoid problems at a later stage. A good information sheet explains the objectives of the project, what is going to happen in the project and the nature of the participants' involvement, as well as the rights of the participants and what is expected from them. In co-design projects, it is also important to explain the rights of the design and the possible confidentiality issues.

Advisors were asked to recall their understanding of co-design and public involvement as they had perceived them before the study commenced. People had various interpretations of these terms and practices. When I asked if they knew what co-design meant before joining the project, some advisors openly admitted that they did not.

*“I didn’t, until we came to that first meeting, now, what is meant by this co-design? Now I understand that it is, a lot of people are involved, not just the designer designing, it is other people being involved with their ideas and the making of it.” (UAG11)*

Some people did not know how to explain the term even afterwards, and I asked if the users thought that it was a word that members of the public would know. One advisory group member doubted that the general public would understand the term co-design:

*“I don't think they understand the term in the general public and I'm not sure that people of my age who have done research work would necessarily understand the term. It was a new term to me, even though I'd done collaborative research, cross disciplinary research, interdisciplinary, intra-disciplinary research, we'd never actually used the term co-design so that was a new term for me.” (UAG16)*

Several users stated that they joined with open minds, and were interested in the topic.

*“Well I joined completely open-minded, I didn't know what to expect at all.” (UAG21)*

This was supported by a comment by another User Advisory Group member, who also mentioned the clothing part of the project being particularly interesting.

*“I think my understanding was they were wanting people on...I think it was an advisory panel, I'm not very clear about that, and the rest really was like well, you know, if we were suitable it would become clearer as the process went on, but it was very clear that you know, it was an area that we were interested because of outdoor clothing.” (UAG11)*

Another remark regarding the understanding of the nature of the project was made by a UAG member, who had the impression that nobody knew where it was headed. The evidence suggests that the DfAW developed as it proceeded, there was no structured plan in the beginning and the project changed along the way.

*“Initially I wasn't quite sure what, until it was explained, and then I felt what we were trying to do was to develop clothing for older people and really just to see where it would go. I think nobody really knew where the end project would be, and I think this developed as we went on, and I guess*

*unless it was going to be controlled, it could have continued, well anywhere.” (UAG22)*

The comment reveals that the definitions of the project objectives and process were not successfully delivered to advisors, and they were left with the feeling that there was no pre-outlined project plan. Alternatively, UAG members were thoroughly prepared yet had no clear focus, so in that case, preparation was insufficient for them to feel equipped.

### **Concerns and fears**

In a similar way to the URG members, the UAG members stressed that they would prefer enough information to be provided at the outset, to support the decision to join and the possibility of withdrawing at any stage. One issue that came up in the advisory meeting and interviews was a concern about where the photographs and videos of meetings would be used and published. Designing and therefore also co-design workshops are very visual by nature, and the team felt that it was important to get visual material from the workshops, which caused discussion in the UAG. One of the advisors says that she had an issue with being photographed and filmed.

*“I really had no idea what it entailed when I came at all. I was just open minded really I just wanted to know what this was about, whether it was something that I wanted to go along with. I was a little bit worried about all the photography and the videoing.”*

According to the evidence, it is crucially important to ask everybody’s consent to be photographed and filmed. This particular advisory group member appreciated that she could have participated in the research without being photographed.

*“I was told about the ability to pull out if you wanted to. I found that very good that I had a choice. In fact I did pull out for a little bit. I said I don’t*

*want to be photographed and then I thought no, yes I'll participate and go the whole way. And be photographed or whatever.” (UAG16)*

She even wanted to test if she had the right to withdraw from being photographed or filmed. When she got the permission, she was happy and finally decided to accept photography.

*“And in a way it was a good thing because I put it to the test. I emailed X and said I don't want to have those and she just said that's fine, no problem. You can pull out. And then when it started, I thought no, come on. If you're going to be involved you are involved. And I personally chose then to come back in and have photos.” (UAG16)*

Regarding the fears and concerns presented in this section, according to the findings, the solution seems to be to give enough information to the participants and to explain the details patiently. It is understandable that new experiences create concerns, and the team members need to take this seriously.

### **Clear objectives and project scope**

The importance of having clear objectives became very evident during the project, and advisors brought them up in the interviews.

*“If you get the agenda right, I think the flow of information and the process building would reach a better conclusion than perhaps it did do, though I keep stressing it's not a criticism, but I just think from the common sense. ... And it would've been better from your point of view and certainly better from the advisors' point of view if it had been sort of just a little bit better thought about.” (UAG23)*

These findings suggest that the project objectives were not clear for the advisors, which caused them confusion.

*“I think it is vital that you know right at the start what the end product is going to be. I don’t think we were completely sure of what was going to come out at the end, so had we known that then I think we could have, I mean our role was to critically comment on what was going on. ... Whereas at the end, when (project lead) came up and she told us what was going on down there and what had been happening, then you felt well if I had known that then I would perhaps have said this and that.” (UAG21)*

One UAG member said that after each meeting he discussed it with his colleague. The last sentence in the following quote is significant because it demonstrates the confusion about the significance of the advisors’ contribution.

*“Well yes, I mean when going home, we would say well what actually was the aim of that particular session? Did we achieve anything or were we going over old ground that we had done before? Had we moved forward? ... We were always conscious that was it valuable what we were doing, were we offering anything of use to you and if we felt that we weren’t, that is when I felt a little bit uncomfortable, was I there under false pretences.” (UAG21)*

Several advisors agreed that they would have appreciated more confirmation of the significance of their contribution. They suggested clearer communication about the research process.

*“It’s nothing more than – people who had got together at the outset said, This is why you’re here. This is what we want you to do. And this is the way we’re going to do it. Instead of which there was a sort of a we’ll all go down a blind alley together situation. And from the point of view of an advisor, I mean I wasn’t there to criticize how things were being done but I have to say there was a slight failing of, well, who’s in charge here and who’s doing what and what do they want from us?” (UAG23)*



Advisors would have appreciated continuous updates, including what was done in the previous session, what the findings were, where the whole project was going, and what was going to happen next.

### **The definition phase**

Most UAG members mentioned the importance of having clear aims, a structure and an agenda. Because people felt so strongly about this, there are several examples of it, and I have chosen the ones that best describe their views. The previous comments highlight that the overall picture is very important and the lack of it will affect the whole experience, even if the individual co-design methods are purposeful and enjoyable. Another advisory group member also brought up the same idea:

*“I think the discussions when we were discussing something tangible, or we were given a problem to solve or what our ideas would be on a certain topic. So if we were put on the spot and we were asked to say something definite about a particular thing that worked well.” (UAG21)*

He continued that the activities carried out at the UAG meetings worked well, but a factor of concern was not being able to understand the full picture:

*“Specific tasks I thought worked well, the visits I thought worked well, the informal talks on our walks worked well. And I think the last meeting, where we actually saw, for the first time, the product and you thought ah, well, this is it. And then of course when we went out with them and the flaws and all the hiccups were there for all to see as it were, I thought well perhaps that could have been solved a little bit earlier on, if we had seen a little more of that.” (UAG21)*

Many advisors stated that they would have liked to understand the whole project better.

## Planning phase

The UAG members explained their views on the importance of planning and making the objectives clear for everybody. Without knowing the proper project management terms, the advisors mention the importance of the project charter, scope planning and communication plan.

*“I think having spoken to people in the group I think there was certainly some people were thinking that there was a lack of organization at the outset which we’ve just discussed. Maybe that can certainly be improved on in the future. ... It’s nothing more than – people who had got together at the outset said, “This is why you’re here. This is what we want you to do. And this is the way we’re going to do it.” (UAG24)*

The evidence suggests that users are highly interested in why they are needed and what is expected from them. This member continues that he was left with the feeling that nobody had a clear view of the overall situation, and it was unclear who was in charge, which made him feel that everybody was lost together. He describes it as a ‘we will all go down a blind alley situation’.

*“Instead of which there was a sort of a ‘we will all go down a blind alley together’ -situation. And from the point of view of an advisor, I mean I wasn’t there to criticize how things were being done but I have to say there was a slight failing of, well, who’s in charge here and who’s doing what and what do they want from us?” (UAG24)*

Many UAG members describe how they truly enjoyed the advisory meetings and activities, but what concerned them was that they did not understand how they fitted into a bigger picture.

*“I don’t think that that necessarily interfered with people’s opinions about what we did and their opinions about their garments and experiences with*

*the shops visit and the factory visit, but it certainly would have been improved on if that was set out right from the start, the agenda if you like.” (UAG24)*

The above findings considered the overall project planning process and informing users about the holistic project plan. The following findings are related to the planning of individual workshops. It was suggested that an official starting day event where everybody meets each other face-to-face would be ideal.

*“If you look at that 18 months that the project had already been going, how did the 2009 people start it all, and we came in in the middle so they already knew, it’s like starting in the middle of term at school.” (UAG13)*

As there were only irregular meetings of the research team and only one meeting of all of the stakeholders (belatedly, at the project’s end), many interviewees expressed a lack of knowledge as to what the other aspects of the project were. One of the User Advisory Group members proposed that physical meetings and updates between the groups would have been helpful to gain a general understanding of what the others were doing.

*“If you could have gone to one of the others and explained to them where you were, how we were inputting and somebody from them could come to one of our (Advisory Group meetings) ... and say this is where we are, what your input is giving us this, and that sort of thing.” (UAG22)*

While some attempt was made to keep a sense of cohesiveness through virtual meetings, using Skype or teleconference facilities, these were rarely organised or they were held at a time that several people could not make. The hazy start, therefore, continued throughout the project, with various team members and users wondering where their contribution fitted in. In addition to the fact that everybody involved in

the DfAW project never met each other in real life, several people stated in interviews that they never understood who was involved.

*“There could have been a better understanding as to what everybody was doing. Everybody was too fragmented, and you felt, even though you knew other people, you were in isolation, and I think it would have been much better if we’d have known exactly where they were with their project to give us a feeling of being more involved in a wider aspect. I think we felt involved in what we were doing, but it wasn’t until we went down to London that we actually felt that we were part of something much, much bigger.” (UAG22)*

The UAG members especially declared feeling like ‘outsiders’. As one advisory group member stated in the previous extract, he only understood during the final conference in London how big the project was and what he had been involved in. The need for greater orientation is more apparent as this was a long and complex study. In such studies, it is reasonable to expect steps to be taken to help people get to know each other and the study purpose and plans. Meeting everybody in the team is considered crucial, but in this case there was no meeting with any of the wider team nor the project leader until the study’s end.

Meeting the whole team might not be necessary if the project only includes a one-time participatory workshop, but for the sake of effective working in longer projects, it is crucial. It was stated that a meeting with the project lead would have been ideal to help clarify expectations and the nature of the project.

*“It would have been a lot better if we’d met her (Project Lead) in the beginning. She could give us her ideas of what she expected from us. ... I think she needed to come and communicate with the project more so that we knew the aims and to, so we’d meet her and so we knew she wasn’t*

*just a person 60 miles away, we didn't have a picture of her at the beginning did we, we didn't know what she looked like." (UAG13)*

The previous quote highlights that the project lead is seen as an important authority and as a person who makes the decisions. Therefore, it is crucial to understand what the project lead is planning and aiming for in the project.

These previous comments emphasise the importance of communication and delivering a clear agenda. The User Advisory Group members' assumption was that there was too little collaboration between the two groups because they did not get sufficient information about what was happening in the User Reference Group. In contrast to the previous comment, I took part in the User Reference Group workshops, and I was aware of what they had done, but I and the other team member had no clear idea of what was expected from the User Advisory Group. Therefore, we did not update the advisory group properly. This also explains why the UAG members saw the project lead as the highest authority, who was holding the final purpose and agenda that nobody else understood.

A clearer orientation would have enabled people to participate more fully and ease any anxiety of not knowing what was happening in the project. This left many interviewees believing the vision for the project was held tight to her chest by the project lead, instead of sharing it openly for the benefit of others. It was recognised that this was likely done inadvertently, and it was believed that the project lead did not realise this problem was being experienced. Surprisingly, users still continued their involvement in the project despite their later criticism of not having an early understanding of their role in the UAG, the URG and the project at large.

## People getting to know each other

The first two UAG meetings were spent explaining the project and the ethics of involvement. Even though it is important to give this information, a few UAG members suggested that the walk that took place during the third meeting would have been a good way to start. In their opinion, the more informal environment would have worked as a good icebreaker. This was brought up in the following comment:

*“Only that again that was an opportunity for the group to get to know each other, which then had a beneficial effect in the more formal situation in the room, whereas outside where you were walking along and you just chatted informally with the person next to you, you got to know their background and I think then in the room it was less intimidating.” (UAG21)*

The idea of starting the co-design project with an informal activity such as a walk was supported by other advisors as well. In the following excerpt, one advisory group member explains that too much time should not be spent on covering the practicalities, to avoid people losing interest.

*“I would just tighten up on the beginning. I think the first section on why you are doing it and all the rest of it, and you know, the confidentiality stuff, all the stuff that you have to do, I think could be done in half an hour personally. ... because people turnoff. They are not really interested in going through line by line.” (UAG12)*

As mentioned by several other users as well, the familiarity of the group makes it easier to express one’s opinions and to take part in the conversation. Indeed, it is important to introduce all participants at the start of the co-design project, but also at the start of each meeting or co-design workshop in case there are new participants, and to have a warm-up to support a more flowing collaboration and discussion. In addition to the benefits of familiarity in the group, another possibly more significant issue is a clear starting date, where the aims and proceedings of the project are

covered. As will be presented further in the findings, the interviewees also highlighted that having a clear structure and common understanding is very important. There must be a good compromise on how to start a co-design project in a way that covers all essential matters, but also gives the users the opportunity to get to know each other. As a summary of findings regarding the importance of knowing each other, it was considered a good recommendation to start a project with everybody at the same time and to give the users the opportunity to meet everybody involved, so that everybody starts on the same page.

## 2. Co-design methods

I asked the advisors how they understood co-design. They understood it well, and explained it as a multi-disciplinary process.

*“Well co-design, that would involve a multi-disciplinary group, where the professionals and laypeople were both involved, both having inputs and both valuing each other’s opinions and hopefully some tangible results would come out from it.” (UAG21)*

The previous answer highlights the fact that people need to be willing to understand each other.

### Advisory meetings

Although the user group in Salford was named the UAG to make a distinction from the user group in Newport, they did not have a clear role as advisors, and they mainly gave their opinions on the design.

The first UAG meeting was spent explaining the nature of the project, the ethical procedures and the role of the advisors in the project. Even though explaining the ethical issues concerning participation in the co-design project is good practice, it was considered boring and tedious.

When at the first UAG meeting there were not enough participants and not enough men, one of the users promised to bring along men from their walking group. Not only did the members of the same walking group form a clique, which caused problems later, but the practical and ethical issues were also covered in the following meeting again, which resulted in repetition for those who had been present at the first meeting. The findings regarding the importance of having clear aims are presented in depth in the section about purpose, but the following comment highlights the importance of giving clear objectives for participation in the first meeting.

*“So I would have liked more information on, we are doing this project perhaps for, to make this clothing and we want to make sure how it works, and these are the specifications of them, and this is the material.” (UAG13)*

During the third meeting, the UAG members were taken for a walk to test the equipment, to get to know each other and to give their views on their walking clothing. As stated earlier, this was considered a good co-design method and a way to obtain users' views in a real-life situation.

## **Walk**

One of the co-design ideas was to ask advisors to bring their walking gear and take them for a walk. The rationale behind this was that the designer could see the clothes being used in real life. The walking exercise revealed some challenges that should have been considered beforehand.

*“I thought that was an excellent way of picking up information from other than being just in a room, because this meant that people could expand their views and make comments about things that they could physically see and I think there was a freer environment and people didn't feel reluctant to speak, rather than in a meeting room. So, to talk to somebody walking they would tell you exactly what they felt. So I thought that was a very good way of getting information out of people.” (UAG22)*



Although most of the advisors saw the walk as a good method, it also made the differences in their walking levels stand out. The walkers in better condition felt superior to the slower walkers.

*“We remember that one quite well because, X and X said that they only did three miles and they stopped for coffee and they stopped for breakfast and we often comment on it, they were really tired after we’d done this little walk in Salford, they were behind everyone else, they didn’t seem, it seemed to tire them out more whereas we’re used to do more, six, seven, eight miles and, you know, it wasn’t good.” (UAG13)*

On the other hand, it made the advisors aware that there are very different types of walkers who do not all see their hobby in the same way.

*“Well for me, I think it was educational that there is a wider group of people out there. So my narrow mindedness about what I was doing had to disappear.” (UAG22)*

I also went for a walk separately with one UAG member’s walking group, two other UAG members’ walking groups and with one advisor and his friend. I chatted to them about their clothing during the walks. All the respondents agreed that the method was useful, and I got to see what their walking hobby is like. On these walks, I adapted to their walking level and observed how they do it. Support for this approach was expressed well by one advisor:

*“I spoke to X afterwards, and I thought it was an excellent way, in fact, a super way to do it. I think you got more out of both of us than you would have done anywhere else. Because we were in the environment that we enjoy doing and like being in, so you open up and express what you really think. (UAG22)*

The previous comment suggests that design research might be more effective when participating in the action instead of discussing it indoors.

### **The route**

It is important to choose a safe route. We took the advisory group for a walk in a park in Salford. Since the group was rather large, it was a bit challenging to keep it together. Keeping everybody safe while crossing busy roads is a factor that needs to be taken into account beforehand in the planning stage.

### **Recording the conversations**

During the walk, it became evident that one can only record one discussion at a time, and one can lose some information. In this walk, we also stopped to discuss the gear and recorded the whole discussion.

### **Recording technology**

There are some requirements that a walk sets for the recording equipment. It is difficult to simultaneously walk, listen to a conversation and film it. This walk gave me the idea to use a head camera, normally used in action sports. This proved to be a good solution.

### **Mystery shopping**

One of the objectives of the DfAW project was to find out whether the outdoor clothing retail industry has acknowledged older people as a user segment. The method to find out how the advisory group members perceived different types of outdoor clothing stores, service and clothing was called mystery shopping. During one of the UAG meetings we went to downtown Manchester to visit the outdoor clothing shops. Most of the advisors found the mystery shopping method interesting.

*“Well that was extremely useful I felt because you don’t realise, until you are actually in that sort of situation, how you can be intimidated or how you can be influenced by the shop assistant and as a layperson, it was good to see the different approaches and how you could be guided in a direction that you didn’t necessarily want to go by the person who was serving you.”*  
(UAG21)

The following comment is along the same lines.

*“I thought some of the better ideas were actually outside. For instance the going round the shops to inspect the garments as well as the pricing and the various way they were exhibited. And I thought that was a very, very good idea because it was practical and it was hands on and it was also informative.”* (UAG23)

Mystery shopping has the potential to give a lot of information on existing products.

### **Sprayway visit**

One of the UAG meetings was spent visiting Sprayway’s showroom. The idea of the visit was to educate the advisors on garment design and the manufacturing process and to show them what the whole collection looked like. Sometimes only a very small portion of the collection is bought by the retail shops, so it seems that there are only a few alternatives available from one brand.

*“That was very good. I enjoyed that because it certainly gave us an insight didn’t it, into the work that went on, the time scale that was required to implement a new design. ... When we went and did the mystery shopping one, it helped actually you know, we knew what we were looking for, when we did the mystery shopping.”* (UAG12)

Many advisors liked the opportunity to see an actual outdoor clothing brand's showroom.

*"The visit to Sprayway was very interesting from my point of view as it gave me a very good insight into what needs to be taken into account during the design process." (UAG24)*

This view was shared by many.

*"Then we went to the Sprayway which we found...I thought was extremely interesting. I really enjoyed that to see the problems that the manufacturers had in reaching the general public even with the design of one piece of clothing and the problems that could arise. And they've got their problems of getting clothing into a shop and reaching the right people and I found that all very interesting to see from the other side. We often look at clothes and think why do they make that. And now you know why; what happens in the process." (UAG15)*

Some advisors felt that they would have liked to know more about the manufacturing process.

*"I mean while the actual visit to Sprayway was a good idea I think maybe Sprayway should have had somebody there to say. ... So it wasn't that much different from the shopping trip really. But if the purpose of that visit was to inform people on the manufacturing side I think a little bit more could have been done by Sprayway themselves just to say, Look, this is how we make these garments and this is why we do it that way." (UAG23)*

Overall, the advisors felt the visit was useful and informative.

## **Final meeting of the User Advisory Group**

In the last evaluation meeting, the advisors were able to see for the first time the design prototypes that the URG had co-designed, and to evaluate them. Therefore, the last meeting was completely different for them than for the User Reference Group, who had been involved in the design development throughout the course of the project. Some advisors found the evaluation enlightening, but there were also comments stating that the evaluation came too late and was too short.

*“The second walk was undertaken to give some experience of a couple of technical innovations designed by other members of the research team and was followed by a session with the designers themselves. Again, I thought this worked reasonably well, although there were only a couple of devices available and in order that as many of the advisory team as possible could see them in action we only had a short amount of time with them.” (UAG24)*

By the time of the evaluation workshop, not all of the prototypes were ready, and when I interviewed the advisors, they were still curious about the results and both the users and advisors hoped that they would be kept up-to-date about the results of the research and the outcome in the future.

## **Evaluating the participation**

In the last meeting, there was also a group discussion where the advisors got an opportunity to evaluate the whole participation experience with a new person from the research team who had not been working with them. The advantage of a new person was that the advisors did not feel the need to please the person.

This section has examined the moderation of the co-design workshops, the focus groups and the advisory meetings. It is clear that the facilitating and moderating style is a major factor, although the group composition also affects the outcome. If the groups are very heterogenic regarding the numbers of introverts and extroverts, the

moderator has to do more to give everyone an equal opportunity to express their opinions. As suggested by one of the User Advisory Group members, the moderator needs to pay extra attention to the quieter participants, and ask them specifically what they think. There are several ways to facilitate the conversation and all of them have pros and cons. A structured approach can feel draining, but an open conversation format requires a sharp moderator.

### **3. Facilitation of the workshops**

Many co-design methods can include group discussion as a form of design research. Group discussion requires a facilitator who ensures that the discussion flows in the right direction and that everyone has an equal opportunity to express his or her opinions.

*“I think in the advisory group we did have one or two very strong characters who obviously were used to group discussions. They had more of the skills and they tended to, I felt their views came across more strongly than perhaps other people who were not used to that sort of situation and held back a little bit.” (UAG21)*

The previous comment highlights that everybody should have a feeling that he or she is accepted and listened to. The following section presents the findings regarding the facilitator’s role.

#### **Facilitator’s role and responsibility**

There are three main ways of having group discussions around the table, and there are pros and cons to all of them. One of them is to go around the table so that everybody takes their turn but then everybody else obviously needs to wait for their turn, and the discussion can feel a bit saturated when the same answers are repeated. The second alternative is to have a free discussion where participants can either raise their hands for getting a turn to speak, or it can be a completely unstructured

discussion. The third common approach is to divide the group into smaller groups and then the results of the subgroups are presented to the whole group.

I asked the interviewees which method they liked best. One UAG member found that the challenge of the free group discussion was the dominant participants.

*“The trouble with the large group, you can get a dominant person whose views seem to overwhelm everybody else and some of the quieter, more timid members, would feel a bit restrained. If you go round the table, I have a feeling that those at the end tend to pick up the ideas of everybody that has gone before them and therefore if they had something that doesn’t seem to fit in with everybody else, they feel a bit more intimidated and think I had better not say that because it doesn’t seem to fit in with what everybody else is saying.” (UAG21)*

The previous and following comments highlight that going around the table can build pressure to agree with the others and at the same time find something new to say.

*“In some cases I felt I wanted to say something but perhaps someone else had said the same thing that I was thinking or, and therefore I felt as though was I not contributing enough because they’d already said it which would be a more forceful person, I’m more of a, I know I’m talking a lot now, but I’m more of a listener than an expressioner of things.” (UAG13)*

She also had another good point that going around in a specific order can mean some relevant comments are forgotten or do not feel relevant by the time it is your turn to speak. Another advisory group member found that discussing the issues in a small group led to the most relaxing atmosphere and agreed that going round the table builds up the pressure. Several UAG members suggested that the moderator should encourage the quieter participants to speak by asking them specific questions.

*“So it’s better then if the leader actually then encourages that person by asking a question of what, and how would you feel about that with your experience?” (UAG22)*

By asking the shy person specifically, the moderator pays attention to the person, giving them more space to answer and the feeling for the person that their views are appreciated.

The moderating of group discussions is a skill that is developed by doing it. It can be seen as including two jobs: firstly, listening to what people are saying, and secondly, keeping track, so that everybody has had an equal opportunity to express his or her opinions.

*“You throw a gang of people together in a room, inevitably there’s going to be some people who stand up and make themselves heard and inevitably there will be some who take longer to become confident to then speak up and make themselves heard. That happens in any group dynamic.” (TM23)*

Many UAG members stated that when several meetings had taken place, and people had got to know each other, expressing their opinions became easier.

*“I think it is really just a matter of time, I think as the group got to know each other, then towards the end you were prepared to challenge, whereas at the beginning you felt oh no, I am not capable or I am not well enough informed, but I think towards the end that fear had gone a little bit and you were prepared to hold your ground and say what you thought.” (UAG21)*

In general, the relaxed atmosphere was seen as an important encouraging factor that made it easier to express one’s opinions.



*“It was relaxed, that is the important thing, people have to be put at ease and feel comfortable and relaxed, it is not to be, if it is too formal and stuffy people withhold their views.” (UAG21)*

According to the interviews, it was quite common to fear that you might say something that makes you look less smart and less respected among the team members or participants. A relaxed atmosphere and the moderator emphasising that all responses are welcome can encourage participation in the discussion.

*“We were listened to, whatever anybody had anything to say, we were listened to, we were never put down, even if our comment, perhaps when you thought back, why didn’t I keep my mouth shut, nobody made you feel like you had said something stupid or anything.” (UAG11)*

The findings suggest that another point to consider is how the participants’ background and the group dynamics affect the group discussion.

*“The people were what I was expecting I think because I thought it would be unusual to find a lot of researchers, you know people with research experience volunteering but I did think there might have been a few more.” (UAG16)*

The results suggest that professional research experience or previous participation in focus groups both play a role in how a person participates in a group discussion.

## B) Collaboration

This section presents the findings regarding cross-disciplinary collaboration and the importance of clear and transparent communication. These findings indicate that a successful design outcome and user engagement require smooth collaboration between team members and project partners. The first subsection deals with the findings about how the advisors viewed their roles and responsibilities. The second subsection reveals the findings concerning communication and the need for a communication plan. The last subsection presents the findings concerning shared language and sharing disciplinary knowledge.

### 1. Roles and responsibilities

Because a clear distinction was made between the users and advisors, the advisors' separate role was emphasised to them. Therefore, almost all of the UAG members were able to call themselves older walkers and advisors, not participants, but they were unsure about what their role as an advisor was.

*"The role that I was led to believe was... I have forgotten. Advisor, sorry. You'll have to cut these things out. Which obviously has took us awhile to realize what it was all about as well." (UAG14)*

All of the walkers who joined the project had some experience in walking, but their professional backgrounds differed from stay-at-home mothers to businessmen, and from people with a scientific background to people with commercial jobs. Some of them had been involved in research in other fields, mainly in natural sciences, in their professional careers, and multi-disciplinary collaboration was also familiar to some of them through their professional lives or voluntary commitments. A few had experience in designing something other than clothing. No-one had experience in design research and a full-scale co-design process, but one member of the advisory

team had been involved in giving comments about outdoor products to the manufacturer.

*“Not in this type of thing no. Apart from about 20 years ago a friend of mine tried a new piece of equipment which was from Paramo, and we all admired it and checked it over and what have you.” (UAG22)*

As a conclusion, being part of this type of a co-design project was new for all advisors.

### **Selecting participants**

The UAG consisted of individual walkers and group walkers. Those who joined the project alone thought that it brought an imbalance to the group that half of the members already knew each other. I also asked the walking group members whether they would have joined without the group. Many of them said they would not.

*“I think it would be just...it’s fine tuning rather than a massive change. I just think it’s a question of the leaders giving confidence to the people that are round the table. Perhaps being a little bit more selective who you pick.” (UAG22)*

The answers highlighted the importance of group dynamics. Six of the advisory group members out of 12 were friends and belonged to the same walking group, which distracted other people.

## **2. Communication**

The aspect of communication that the advisors were able to comment on was obviously the communication from the team to the advisors themselves. It is very important to keep all stakeholders updated about changes in the project or if there are going to be longer gaps between the meetings. One of the UAG members described it in the following way:

*“The only thing that I didn’t like was the long gap, when we didn’t know what was going on, I mean had somebody said we won’t be having a meeting for a while, fine, but we didn’t get that so we kept going has it stopped, what has happened?.” (UAG11)*

Communication appeared to be one of the major pitfalls. It became very apparent that participants need to be kept up-to-date on how the project is proceeding.

*Communication, as I say a lack of direction and clarity, that is the biggest pitfall, that there must be clarity of purpose. (UAG21)*

When a project is long and can take several years, it is important to keep all stakeholders informed about the progress. Also, frequent meetings between all of the stakeholders are important. If the project has several locations, it is important that frequent updates are made. In particular, the advisors in Salford gave feedback that they would have liked to know the bigger picture better and know where the whole project was heading.

*“I think that was done just right, because you sparked my interest with that first meeting, the way it was all explained. Stick to the plan, we will meet every other month or something like that, maybe give them a program of dates, when we are all going to meet and then like we said before, you can block that date off.” (UAG11)*

As the previous comment suggests, it might be a good idea to set all of the meeting dates beforehand so that the participants can prepare for them and keep them free. Some participants did not consider the secured dates crucially important, but everybody agreed that the dates should be set far enough in advance so that all willing stakeholders could join them.

### 3. Shared language

Shared language was one of the aims of the project, and one UAG member describes it in the following way:

*“That we are all singing from the same hymn sheet? We all know what we are talking about and able to discuss it. I mean if we don’t know anything, the terminology, I would ask because I don’t want to be left behind if I don’t know what you are talking about.” (UAG11)*

Learning the common terminology was a learning process, and advisors learned along the way in the project.

#### Learning process

UAG members felt that the terms and foreign concepts were explained to them, and they generally had the possibility to ask about them.

*“I think an explanation of anything that was not in our vocabulary, everyday vocabulary, could have been explained to us. I also think we would have said, I don’t understand, what does this mean, which we did.” (UAG13)*

The workshops in which discipline-specific knowledge was taught should have been more structured and better organised. They were too different and fragmented, and there were no goals set for what others should have learned from them, the advisors said.

## **Courage to ask**

A familiar group and a relaxed atmosphere make it easier for users to ask questions if they do not understand something. The advisors stated that when they got to know each other better, it became easier to ask or disagree. The advisors also found it important that the moderator highlighted the fact that you can ask questions, because it gives people the permission to do so.

*“Do you think people are confident in that kind of situations to ask? I think so, yes, I think so because we all got to know each other quite well, well I mean as a group, there was no falling out or anything like that and I think we all felt comfortable within the group so that when you went round asking for questions we did ask questions, I think we all had something to contribute didn't we?” (UAG11)*

Some advisors felt that they did not want to embarrass themselves and look foolish by asking questions. One advisor stated the feeling that you could let it slide, and would probably not need it later.

## **Glossary**

Most advisors found that a glossary would be a good idea to look at the new terms.

*“If I'm doing a cross word and I think gosh that's a funny word there, I'll look it up. Whereas if I have the glossary, yes I would do that.” (UAG13)*

Some advisors thought that a glossary would not have made any difference, or they did not consider it particularly helpful. Another interesting thought is that a glossary could even be harmful if it was seen as scary from the advisors' point of view. My take on this comment is that it could put pressure on people, and in that way scare them away from engaging in a co-design project.

## C) Setting

This section presents findings about the setting of the co-design workshops. The section is divided into five different sub-themes, which are: Location, Equipment, Time, Hospitality and Finance. These five practical aspects need to be considered before the user involvement starts and develops during the co-design process.

### 1. Location

Most of the participants felt that coming to the university was exciting and made them feel needed and important.

*“I think for one or two who had not had the advantage of a university, to be actually in a university was something, which was enriching for them. To feel valued, somebody who perhaps hadn’t gone on to higher education, universities can be intimidating but to be involved in something and you think oh, I have actually been in that building, I have been in a – so I think for one or two of the, it was an enriching experience.” (UAG21)*

There are several perhaps obvious aspects that influence the correct choice of location. One of them is the convenience of the travel involved regarding the time, distance and cost. Most people were also in favour of avoiding rush hours, and the place chosen can affect that as well. One advisor found that coming to the university was easy because it was located by the train station, and retired people had train passes.

*“No, I don’t think so, I have really enjoyed it, to be honest, I thought it has been great and everybody has been so friendly, we felt welcome whenever we have come, I think it has been really good, comfortable, nice place, I enjoyed coming to the university, it was easy for us to get to, didn’t cost us*

*anything, we could use our passes on the train, so I have no complaints whatsoever, happy experience.” (UAG11)*

The advisory group meetings were held at the University of Salford, which has quite a vast campus and complex buildings. The responses also indicate that signs are useful for orientation, but can still cause hesitation.

*“I think any building that you go to on the first instance is a bit intimidating if you want to call it that because you don’t know where you’re going. Once you’ve got an idea of whereabouts you’re going, where the lifts are or the stairs, what floor you’re going to, and then you’ve got the corridors. ... but we’ve all got a tongue in our head, we can always ask.” (UAG13)*

I asked: do you think that people had difficulties finding different rooms?

*“Yes, in one sense it was because we were unsure of where we were going. In another you did actually put signs up on the wall which was a good thing to do. But you’re still thinking, well, am I going in the right direction, you know, I don’t want to be late. I think that was the feeling, well in my case. I don’t like being late, I like to be on time or a little bit early, so if I’m going to a different room when I get there I think, oh, where am I going to, I don’t want to be late.” (UAG13)*

The previous comment highlights the insecurities that participants may have towards finding the right place. The easier attendance can be made for them, the fewer concerns they will have, and thus they can concentrate on the actual subject.

### **Setting of the room**

The choice and setting of the room appeared to have an effect on several aspects of successful co-design. Even though the only user participation activity was discussion, the table was suggested to be important because you can take notes on it and place



your coffee cup down. It was considered important that everybody could see each other and hear well, and, therefore, a round table was considered the best alternative.

*“It would have been nice to have had a round table but that is impractical I would assess. ... It’s nice you find if you’re having a meal a round table is a lot nicer, it’s more friendly, you can talk to different people, communicate better. But the, as long as it’s quite, it’s reasonably warm, and it’s clear and bright and clean.” (UAG13)*

As the above comment also suggests, enough light is required, and the room should be clean and not have any distracting elements. In summer, air conditioning, and in winter, heating, are both important to keep the temperature comfortable. When co-design workshops take several hours, it is important to have the opportunity to open the windows to get fresh air.

## **2. Hospitality**

This section presents a surprising finding regarding practical concerns over public engagement in co-design activities – the importance of catering. Almost everybody I interviewed had an opinion about the catering, meaning the food and drinks offered in the meetings and co-design workshops. These findings suggest that catering can make a big difference in the user participation experience. In general, everyone was very satisfied with the catering and was able to find something to eat. Many even used superlatives when describing the catering:

*“I felt the catering was excellent. It was marvellous.” (UAG22)*

The following comment highlights that there are many different opinions about food:

*“The food was very, very good, it was excellent. Some of it could have been warmer which we did mention, I don’t eat spicy foods but some of*

*the girls said, oh it was cold out, we should have had warm food. But you provided with quite a good selection of different foods so, and the different people as well. ... It's very difficult to provide a buffet for, unless they're going to bring it hot or done as they go. The tea and coffee was plentiful so that was a good idea, you know, that kept us going." (UAG13)*

On a few occasions, some food that was supposed to be hot and was not, and people remembered it.

*"No, well I did not like the lunch at all. Well some of the things should have been hot and they weren't, but that has happened before and I just didn't like that taste, it is not me and I am not a fussy eater, I just had two little sandwiches but that is my only complaint." (UAG11)*

Another point is to keep up with the expectations set in previous workshops. An example of this is when biscuits were missing one morning, and several people remembered it in the interviews.

*"The coffee was excellent, it was nice to arrive in the morning to get a coffee and a biscuit, I was disappointed the day that we didn't get biscuits, because that was the day I hadn't had any breakfast, I thought I am looking forward to my coffee and my biscuit, I thought where is the biscuits?" (UAG11)*

The same experience stayed in the memory of another UAG member as well.

*"I think there was one session when we came in the morning, arrived and there was just coffee and no biscuits. Normally we've always had biscuits. I know it sounds silly but you've been up early, you've travelled and sometimes you could do with a biscuit with your coffee." (UAG15)*

A third point that was mentioned about the catering were the disposable cups.

*“Proper cups. That’s nicer, I’m not a disposable cup person, really, you know, I’m not a McDonald’s person. ... I think it makes a big difference, for the older people, again if you’re going to have young people, what shall I say, from 18 to 30s they’re used to these disposable cups so they want those rather than a cup and saucer, they think that’s a bit over the top don’t they, a cup and saucer?” (UAG13)*

The previous comments focused on details. The disposable cups are an example of a detail that may not occur to a facilitator, but can make a difference in the participants’ experiences. These practicalities and moderating style issues are also examples of matters in which the participants’ age plays a role, as stated by the User Advisory Group member in the previous comment. Young people’s preferences can be different to older people’s. Therefore, it is essential to find out beforehand what the values of the target age group are.

Another interesting detail is described by one of the ladies in the User Advisory Group: the food should be recognisable. Her comment perhaps suggests that it is not considerate to offer food that is too exotic, that people are not familiar with. Another reason for labelling the food is allergy issues. If the content is stated clearly, it is easier for the participants to know what they can eat. However, the advisors were asked to state their allergies and issues when they signed up and nobody had any, except to food that was too hot.

*“Names please, that would be good especially if it is something we are not used to, I mean I can see what an onion bhaji is like or the simosa but the other things on a stick or the like fingers, goujons or whatever they were, but a name, whether they were fish or meat would have been interesting.” (UAG11)*

This is obviously an easy matter to organise, but it needs to be taken into account beforehand, either by writing down the content of each dish or asking the catering service for labels. It is good practice in participatory workshops to offer the participants refreshments and coffee, and a proper meal, if the workshop lasts a whole day. The findings indicate that the power of the impression caused by catering must not be underestimated. Food creates many emotions and opinions in participants, and it affects their experience of their involvement in a project.

## **D) Impact**

This section has two parts. It presents the findings regarding the impact the co-design project had on the UAG members and how the advisors perceived their impact on the design.

### **1. How user participation in co-design impacted the end result**

The findings suggest that there are two different types of impact that derive from involving users in multi-disciplinary co-design projects. First, I will consider how co-the design process affected the design. In my research, I did not evaluate this in an objective way, but I asked all of the stakeholders if they found that co-design had had an effect. The findings also indicate that the co-design process has an impact on those involved. I will first present the results relating to the products and then those relating to the participants. Although it is important that people are told that their contribution was needed and important, if they do not see evidence of this, they remain unsure of their relevance.

*“What impact? I don’t, I can’t see what input we actually had. You say we were helpful but we think well were we because we don’t really know if we were helpful.” (UAG13)*

Although the user group in Salford was called an advisory group to make a distinction to the user group in Newport (the User Reference Group), they did not really take an advisory role in the project but instead also gave their insight into the design. The difference to the user group in Newport was that they did not actually see the design take place, which caused frustration and a feeling of a lack of purpose.

*“Yes. Well I can’t see what contribution I’ve made to be honest with you as to what difference it will make to anything. As I’ve said before I have come to the conclusion in my own mind, doesn’t mean everybody else has got to agree with me, that I think it is just somebody, somewhere that makes the decision on what’s going to be out in the future and I can’t see, I don’t think what we say really matters. I don’t think its’s going to impact.” (UAG14)*

As the above comment indicates, the knowledge of whether the person or the group contributed to the project came from the team convincing the participants that they did. Many of the UAG members were left with the feeling that they did not know whether they had made a difference or not.

## **2. How co-design participation impacted the advisors**

If the advisors were unsure about whether they met the expectations of the team members and whether they had made any difference to the project’s outcome, they had almost a guilty conscience, and felt frustration about their participation. Several UAG members described how it caused them frustration when they did not know if their participation had had any real impact. One UAG member even described how he felt bad taking payment for his involvement when he did not know if the UAG contributed to the research and design. It was suggested that it would be a good idea to summarise at the end and beginning of each individual workshop where the group was at, and what we had accomplished together.

## **Gaining new knowledge**

One of the most important outcomes was gaining new knowledge. Several stakeholders who were involved with the project stated that they had learned something new in one way or another. Some of the biggest areas where the users' knowledge had increased were around the functional clothing industry, the manufacturing process and the different materials, and in their knowledge of functional outdoor clothing and wearable technology in general.

*"I think the different materials that were used. That was the thing that you were telling us, this material does this and that material ... and then we read the label and it says it's breathable or it's washable but it's got such and such a thing in which makes it that way. And therefore it gives you the concept that you can actually look at it and think oh yes, this is a good one because it's got such a thing in it." (UAG13)*

The UAG members visited the Sprayway showroom and many of them said it was one of the most informative and interesting experiences in the project.

*"The other thing we did, when we went out to Sprayway and we met the designer there, that was very, very valuable to actually then know what the design process was." (UAG21)*

While others found it very informative, one UAG member suggested that the manufacturing process could have been explained in more detail.

*"Well, I thought that was one of the most important aspects of the whole course because if you're going to be asked to criticise or appraise garments then obviously you have to know how they're made. And also how they're made. And in that respect I think the visit to Sprayway was a good idea but I think more could have been done to tell people about the manufacturing process." (UAG23)*

Many UAG members were also disappointed that they were not given actual garments to test, contrary to their assumptions when joining the project.

*“I think it would have been nice to have offered something to the participants of the experiment just to try.” (UAG13)*

In general, the interview data suggest that the Salford User Advisory Group members found the project superficial because it took place at the university and they did not see the actual product designing process or manufacturing, nor were they given garments to test.

### **Meeting new people**

The users and advisors in the DfAW project were older walkers with various backgrounds. Many of them saw it as a benefit of the project that they were able to meet other walkers and therefore get a wider understanding of walking and the different types of walkers.

*“Personal enrichment, you are widening your knowledge of whatever the co-design was. I mean my knowledge of clothing now is far greater than it was before. Social aspect? Again, getting out and meeting people, different walks of life, that was great. Academic rigor again, when you have been out of it for a while, it is nice to become focused on doing your homework. So those were high points, they were the enjoyable.” (UAG21)*

Many advisors named the social aspect to be one of the best parts of being part of the project.

### **Payment towards involvement**

Payment for participation divided opinions, but some advisors were grateful and specifically thanked the team for the money along with the whole experience.

*“Just to thank you very much for the opportunity to take part. As I say I really, although might have been frustrated on an academic side, in terms of the social event, in terms of hospitality, you and (name removed) were delightful the whole time, so welcoming. It was a very positive experience, it really was. And on a mercenary level, the money went towards a nice holiday, which was very much appreciated, so thank you very much indeed for inviting me to take part, it was very good.” (UAG21)*

The amount of money divided opinions. Some advisors found the amount appropriate whereas others wanted more.

### **Creating interest in user engagement in the future**

A few people in both the UAG and URG were interested in further projects related to functional clothing and wearable technology. Some even thought it was a shame that the project ended because there were so many ideas that could have been taken forward. One advisor was encouraged, by their experience in the DfAW project, to participate in another research project.

*“Well because I enjoyed it and because I learnt from it I like the idea of public involvement in research so that lead me to be on the lookout for more opportunities for public involvement in research so I've actually got involved with a couple of other research studies.” (UAG16)*

This user is a good example of how user participation can become a hobby and engagement can also be a skill to learn. Although novices are equally welcome to participate, expert participants can give extra value to the project when they know what to expect and what kind of things are required from them.

The way in which long projects are finished can affect the participants' final impressions of their involvement. The evidence suggests that the final meeting should concentrate on the involvement and accomplishment of the project and all the actual



work should be done before that. Otherwise, it will leave a feeling that the project is not over yet, especially if new information is introduced.

One of the positive outcomes of participating in research or a design project is creating an interest in future engagement. In particular, older people can have a lot to contribute due to their life experience, and they can feel appreciated when their opinions are listened to.

### **Evaluation of the experience and last advice**

I asked all of the interviewees what their conclusions were about the experience and what kind of advice they would give for future reference.

The general conclusion of the advisors' opinions was that they felt welcomed and were treated kindly, but the project and meetings should have been planned better to have more transparency and a common understanding of the timelines and objectives. Below is one UAG member's comment that summarises it quite well.

*"I thought that was most interesting as well. ... The timings were good, the meals, the food was always plentiful, the teas and coffees and if things weren't right, you spent time getting them right. So I would say from a participants point of view we were very well looked after for our physical needs." (UAG16)*

Personality also plays a role in how much organisation and structure are valued. For some people, it is more important than others. Obviously the required level depends on the person, but I argue that there should be a certain level of structure to avoid chaos. One of the team members suggests that creatively-minded people are less structured.

*"So there was an awful lot of good we got out of it. ... The thing that happened was the continuity. Keeping communications open.*

*Communicating when there is a problem like this sudden gap that we mentioned. That could've easily been resolved.” (UAG15)*

The final piece of advice is to plan and structure co-design projects well. Efficient communication requires a strategy; people do not like to be confused.

## **Chapter summary**

This chapter provided the findings for the research objectives and question. This chapter demonstrated the data with descriptive transcripts. It contributes to the understanding of what one needs to consider when running co-design projects. The three main findings are around co-design, including the facilitation and methods used, the setting and the collaboration process.

# CHAPTER 8. DISCUSSION

Chapter 8. includes a reflection on and discussion of the findings. This qualitative case study was designed to explore the factors which influence effective collaboration and public involvement in a co-design research project, using a sample of participants from the DfAW project. The chapter begins with a reflection on the limitations of the study, including the chosen methodology, methods and the challenges related to conducting PhD research in a foreign country. This is followed by an analysis of all of the findings presented by theme: A) Co-design, B) Collaboration, C) Setting and D) Impact.

## Study limitations

This section addresses the study's limitations and discusses the challenges in this kind of study. It discusses the methodology limitations, method limitations and cultural challenges.

## Methodology limitations

I chose to use a qualitative case study, non-participant observation and semi-structured individual interviews for this PhD, and I would choose them again. Regardless of how carefully the study is planned and what kind of methodology and methods are used, there will always be some limitations (Kumar, 2010). The limitations of this study can be divided into the limitations regarding qualitative research generally, limitations caused by the methodology and the choices of methods, and limitations stemming from the research project or the researcher.

Qualitative research may be criticised due to its limitations on the application of generalisations and transferability. Bryman and Mason (2002) highlight how the significance of a qualitative study relies on rich and multi-dimensional data drawn from understanding and explaining the social world. In this light, Lincoln and Guba

(1985) propose that a qualitative research report should provide as thorough a description of the work as possible, to enable readers to judge its transferability.

According to Yin (2008), case studies can be criticised for similar reasons as qualitative research in general. These elements are a lack of rigour and systematic procedure, a lack of scientific generalisation, and the risk of biased views influencing the findings. Yin (2008) also mentions how case studies create large quantities of rich description, which leads to the creation of massive, unreadable documents. According to him, this is also the issue with ethnographies, when they create detailed observational evidence. One of the downsides can also be seen in the long length of field studies (Yin, 2008).

I decided to concentrate on this specific study of the DfAW project because my PhD studentship was funded to complement the project. Objectively and reasonably, this study can be criticised for a lack of a representative sample of different types of co-design projects. I could have interviewed outdoor companies and investigated how they do user-centred design and what methods of co-design they use. It can be argued that, to get a wider picture of public involvement in co-design, this research should also have looked at other co-design projects, and open design completed by utilising the internet. I did not collect data from outdoor companies regarding their engagement of members of the public in their research process or their experiences of user-centred design processes with their customers. My goal was not to be representative, but rather to truly understand the case at hand, therefore the case study approach was appropriate.

The case study approach limited my research plan due to the process and timescale of the DfAW project. The DfAW project itself was not representative of a typical co-design project and this might be a limitation. Firstly, it was carried out by universities and by team members who had little experience of co-design process or methods. Secondly, they did not have expertise on co-design facilitation and the moderation of workshops. The findings would have been different if I had researched professionals and experts in co-design facilitation and collaboration.

In the project there were team members nominated to take on different tasks. With my current knowledge, I would have used existing technology and garments more to get initial feedback from participants and to improve and broaden their experience by letting them try out the best existing solutions. Although the DfAW project collaborated with several industrial partners, collaboration between users and the design team of a manufacturer would have created a real-life situation, with potentially more substantive benefits. If I had designed this type of research independently, it would have taken the format of action research, where the co-design methods would have been iteratively enhanced as the research continued.

## **Method limitations**

The main data collection method was comprised of conducting semi-structured interviews, either face-to-face via Skype or over the telephone, which can be criticised due to the interview mode and the fact that there were differences from participant to participant. Some interviews took place at the participant's home, some in a public cafeteria and some in my office at the university. I acknowledge this limitation and the possibility that it may have affected the consistency of the data, but it would have been impossible, from a temporal and a financial perspective, to collect this large quantity of interview data if I had needed to travel to see every participant across the UK. Another research method limitation was the timeframe for the interviews. The first interview was conducted in the spring of 2012 and the last at the beginning of February 2013. The primary reason for this was the unavailability of the research participants. I needed to take into account their time commitments and respect the period when they were able to give me their time.

The second data collection method was non-participant observation. It can be stated that observation alone would have not been a sufficient research method, as I could not have accurately explained what was observed without follow-up at interview. The issues people discussed during interviews could have not been found out by observation. A positive aspect of observation, however, is that it helped identify the themes for the interview data analysis and then corroborated the interview findings.

## Cultural challenges

Conducting research in a foreign country and culture always poses some challenges. In this subsection, I discuss some of the challenges I faced during my research process in the United Kingdom. First of all, moving to another country brings practical challenges and requires some extra effort.

The most practical and obvious challenge is the use of the language. I can get by well with my English, but language skills of a completely different level are needed in conducting social research in a foreign country. The first challenge lies in conducting interviews, and the second in writing academic British English. The interviews are based on social contact, and British English requires a high level of politeness and the appropriate use of certain forms of language, both of which do not exist in the Finnish language. The best example of this is the use of the word please, which does not exist in Finnish at all. Overall, the use of small talk is very demanding for somebody who has not grown up with it.

This lack of a native speaker's language skills may have directly affected my interviews and findings, but also more indirectly how the stakeholders perceived me. However, it also brings an advantage. Since everybody was aware of my Finnish background and of English being my second language, I might have been able to ask questions and make comments more directly and openly because of the language barrier. This might have provided me with richer and more thorough data than a native speaker. Therefore, I believe that my language skills were sufficient for the data collection, but transcribing the interviews would have been very time-consuming, and therefore it was a good decision for the sake of quality to get the interview transcripts transcribed verbatim by a professional company.

## Discussion of findings

This section examines the synthesis of the existing literature and the findings of this study. Participatory design literature indicates that it is fundamental to understand the goals and the process of a co-design project before it begins in order to achieve good results, effective team work, collaboration and successful involvement.

The evidence suggests that there are a wide variety of factors that need to be decided, planned and executed well before starting the participatory design project. The whole process needs to be rehearsed in the planning phase and then executed to that plan during the project. Both stages have many pitfalls, but the findings suggest that if the process is not considered carefully in detail in advance, it is almost impossible to successfully carry out a co-design project. The existing knowledge and the findings of this study suggest that these factors can be divided into two main categories: meta-level decisions and concrete level decisions.

The meta-level decisions include the purpose of the project, meaning the real-life need; that is, why the collaborative, participatory design project needs to be completed in the first place. In this study, I have divided the concrete level factors into three categories. The first category includes the actual co-design methods, and the facilitation and moderation of the participatory co-design activities. The second category is collaboration, which includes the team work and communication. The third category deals with the practical decisions, which is called setting. All these three categories need to be thought through before starting the co-design process. The meta level and the highest category differ from the three others by being the fundamental reason for the project and the actual outcome of it. The three other categories are the ones that need to occur in practice during the project. In the following, I will present all of these categories and the factors that need to be decided upon in the planning stage.

## A) Co-design

This section is divided into three subsections that look at co-design in the DfAW research project. The first subsection presents the findings regarding the purpose of the co-design, including the motivation for involvement and how stakeholders ended up working in the DfAW project. This subsection also includes findings relating to expectations and assumptions with respect to the project. When there is a lack of clear communication, there is a danger of misunderstandings and false expectations. In the worst case scenario, miscommunication can lead to people dropping out of the project. The aim of this subsection is to reveal the findings on the importance of having a shared understanding of the aim of and need for the project. The second subsection discusses the co-design methods and how the stakeholders perceived the different methods. The third subsection looks at the findings about co-design workshop facilitation and moderation skills. The two main findings regarding the co-design activities are that the team needs to have both thorough knowledge of the co-design methods used and effective moderation skills.

### 1. Purpose

*Finding: All stakeholders must understand the purpose of a co-design project for effective collaboration.*

This section discusses the findings regarding the purpose of the co-design project. As described earlier, the need for the co-design project stemmed from the need for an improvement of existing designs or the need for completely new innovations. In user-centred design, users can often be the source of the need. Botero and Hyysalo (2013) emphasise that it is critical to know the community and their needs. Therefore, it is important to involve users right from the beginning of the project and to encourage them to communicate their needs and proposals for improvement. Even though the need comes from the users, it is still important to evaluate what value the co-design project brings to the users, and to design.



At the planning stage, the full life-cycle of the project should be considered. The following points should be covered before starting any concrete action: firstly, there must be a clear understanding of why the project is needed. All stakeholders need to know what the purpose of the project is. According to Chambers (2011), it is also important to decide who determines the purpose of the project. He also suggests that the participation experience and learning goals, as well as the sharing and analysis methods that will be utilised, should be decided at the planning stage (Chambers, 2011). According to the interview data, in the planning stage of the DfAW project, none of these matters was thought through. One example of this was that several workshops were carried out before the project team had started to think about how to analyse the data. This caused extra challenges because large amounts of data were difficult to analyse. Another lack of planning caused the lack of understanding of the facilitation roles in the project. Users talked to each other simultaneously and an approach to facilitation that was too relaxed caused issues for accurate recording.

Nedopil et al. (2013) agree about the importance of setting specific targets. They claim that the team should create a goal for user involvement and create a shared understanding between the members of the project team about the general and specific aims of the project (Nedopil et al., 2013). This was not fully achieved in the DfAW project. One example of this is that the project lead was planning to make a clothing sample collection, but another team member saw the accurate sizing and testing as more important. A lack of leadership let this misunderstanding exist, and therefore the team had different goals, and their understanding of a common goal was obscured.

Chambers (2011) suggests considering how a co-design project fits into the longer-term processes of learning and change. The DfAW project could have completed a more detailed background research on what data already exists, what is already known and how to progress with the subject after the project. Some interviewees were a little bit disappointed about the impact of the project, but most of the users and team members viewed it as a brilliant learning experience and were convinced that they had benefited from participation.

## The Need

*Finding: A user centred co-design project needs to be founded on users' needs.*

The first aspect that needs to be decided upon is the purpose of the co-design project; that is, why the project is set up in the first place. This requires a decision not only about what the aimed result, product or service is, but also about the experiences, sharing, analysis and learnings that are sought (Chambers, 2011). This sounds obvious, but setting specific goals is essential for successful user integration and creating a common understanding within the project team, and, therefore, it is also important to determine who decides the purpose and targets of the project. (Nedopil et al., 2013). A widely accepted notion is that the shared understanding of a design goal is crucial for successful collaboration in design projects (Feast, 2012). Feast (2012) also mentions that there should not be too many different targets, to avoid confusing stakeholders.

The targets can be divided into two categories. The first target category is the value that comes from designing the new product or service. The principles of participatory design indicate that a participatory process is used when attempting to solve or understand a real-life problem.

Osterwalder and Pigneur (2010) present the idea of value proposition, which means the value the product or service has for the user. The aspects that can provide value can be quantitative, such as a better price or a faster service, or qualitative, such as a better design that enhances performance and user experience (Osterwalder & Pigneur, 2010). Osterwalder and Pigneur (2010) state that product customisation can add extra value and, therefore, mass customisation and co-creation have gained popularity. When thinking of value proposition at the beginning of a co-creation project, it is important to understand the current situation and what the factors are that the design aims to improve.

Companies can turn to user integration to better understand the problems their customers have so they can create new solutions for them. It is also important to think about what kind of value is created for the users who engage in the co-design process, and what possible value is created for the customers if the project is successful, i.e., how the product will help and satisfy the user segment (Pekkola, Hirscher, & Alastair, 2013).

## **The People**

*Finding: Selecting the right people and the right number of people to participate is important for the success of co-design activities.*

Chambers (2011) proposes that it is important to consider how many users are needed for co-design projects and individual workshops. The data reveals that there is definitely at least an upper limit. If there are too many users, it is difficult to observe and record the project. Depending on the project, there is also a minimum number of users, to avoid results bias.

Another point to consider is who the users will be, how they should be selected and against which criteria (Chambers, 2011). He suggests that user groups should be specified (Chambers, 2011). Nedopil et al. (2013) also propose that users could be selected according to an innovation phase. This happened in the DfAW project unintentionally when some users quit during the project, and some joined at a later stage. There were also downsides to the group's changing composition. The team needed to brief the users who joined in the middle of the project, and information was lost when users who had gained knowledge left the project before the evaluation stage.

Users selected for a group can be divided into primary, secondary and tertiary users. For example, in the DfAW project, active older walkers were the primary users and leisure/holiday walkers were the secondary users. The tertiary users could have been

older people who currently are not walkers, but they were not considered. Marketing theories acknowledge the term customer profile (Pekkola et al., 2013). It is important to think about potential customers when a brand starts a co-design project. The co-design team should think carefully about what kind of customers they want to satisfy and which is the most important customer group (Pekkola et al., 2013). In the DfAW project, the most attention was paid to older people who were already walkers.

When it is decided what kind of users are needed for the co-design process, the question about how to recruit them arises. Nedopil et al. (2013) discuss this when they consider individual/personal recruiting and group recruiting. The DfAW project used both of these methods. The older walkers were recruited both individually and from walking groups. The third category is professional recruiting, which was not applicable for the DfAW project (Nedopil et al., 2013).

After acknowledging the real-life need that the co-design project aims to address, the participants need to be chosen. They can be roughly divided into three different categories: the team members, in other words, the professionals who are needed to run the project, the users, and possibly other stakeholders. When selecting the participants, there needs to be an understanding of how many and what type of participants are needed. This is true for all three participant categories, although the criteria for selection differ.

When selecting the team members, there needs to be an understanding of what kind of experts the project needs. The selection of users is determined by the original purpose of the project and the user segment to which the design is aiming to give value (Chambers, 2011). The purpose and the chosen co-design methods will affect the number of users needed and who the most suitable people are (Chambers, 2011). In the optimal number of users chosen for a project, it should also be considered that there is a possibility of users dropping out in the middle of the project. One example of selection criteria is the level of expertise. In some co-design tasks it may be useful to have different levels of expertise. Traditionally, user engagement has involved active users, so-called lead users, who are very keen on using the product and

therefore have a lot of insight. Good insight may also be gained from people who have little or no experience with a product because they might be able to reveal why they are not using the product. When selecting the target consumer group and the users to engage in the process, it is important to consider what kind of customers' needs should be satisfied with the design and who the primary, secondary and tertiary user groups are (Nedopil et al.; Pekkola et al., 2013). Sometimes a different type of users is needed during the innovation phase (Nedopil et al., 2013). For example, users who participate in the design process can be different from those who evaluate the design.

The recruiting process includes giving information about the project and completing consent forms to ensure that the participants are aware of what kind of a project they are joining. The information given should not raise false expectations. This view is also supported by Botero and Hyysalo (2013), who recommend clear goals to clarify expectations. Some examples of false expectations by participating users are the wish for a cure for a medical condition, receiving the ready product, or having unrealistic expectations about what the end product's capabilities are. Another type of false expectation is how the product is going to benefit the wider audience. Therefore, it is very important to know what the users and team members are expecting from the co-design project and their involvement in it (Chambers, 2011).

## **Motivation for involvement**

*Finding: Understanding participants' motivation helps to facilitate collaboration.*

Nedopil et al. (2013) claim that it is beneficial to know the reasons for the stakeholders' motivation. They divide motivation into two types: 'extrinsic motivation' (e.g. money) and 'intrinsic motivation' (e.g. personal satisfaction, social inclusion). The team-building workshop attempted to hold a discussion about the team members' motivation, but it was perceived incorrectly by some team members and did not achieve any goals.

The motivation for involvement can obviously stem from the result, in other words, the value proposition. The team and users need to find out and decide what types of value can be created for a customer with open source design. According to Chambers (2011), the outputs will vary. They can be an improved product or service, a written report or a video. Chambers (2011) also proposes that a person who will be responsible for the circulation and use of the outputs needs to be selected.

As discussed above, the need for a co-design project is the reason why it needs to be carried out. Both team members and users need to see the purpose of the project to be motivated. There needs to be a shared understanding of the holistic purpose, although the personal motivation for involvement may vary. The findings indicate that most of the team members combined their personal interests with their professional ambitions. It might be beneficial for the result if the topic of a co-design project creates enthusiasm and motivates professionals in many aspects. In this case, users were interested in the topic because of their personal hobby and they wanted to know more about using wearable technology and functional clothing to enhance their walking. If the project is long and takes several months, it is good that users are motivated by the topic. Several users claimed that one of the most motivating factors was their will to learn more about a topic they were already interested in. Botero and Hyysalo (2013) recommend building prototypes iteratively and early on, which can also affect motivation positively.

The motivation for involvement was not discussed with the team members and the users at the start of the project or during its course. The findings indicate that it might be a good idea to ask about motivation and measure it during the project, since after somebody has disappeared, it is too late to motivate them. It is not enough that the project lead has a strong vision; everybody needs to share it. This means that the vision and project goals need to be shared in a transparent way. Massimi, Baecker and Wu (2007) also recommend giving out a clear agenda and structure of activities. According to the findings, unclear objectives also affect motivation since they result in participants not knowing what is expected from them. The UAG members in particular highlighted the importance of having a clear agenda and goals.

## Expectations and assumptions

*Finding: Participants' expectations influence involvement.*

Chambers (2011) proposes that it is important to understand participants' expectations of a co-design project. He suggests that it is important to consider at the planning stage how the expectations can be teased out. This was not considered in the DfAW project. I asked in the interviews afterwards whether people's expectations were met, but this does not give an accurate result because it is difficult for people to remember their initial expectations. Many advisors said that they expected to get clothes to test, and they were disappointed when that did not happen for all of them, despite it never being promised to them. Some URG members named physical testing, for example walking with a heart monitor, as their expectation. Regarding expectations and assumptions, the most important thing is to avoid creating false expectations. Therefore, the information sheet needs to be carefully written, and the aims of the project well explained, not only in the first co-design workshop but also throughout the project.

In the DfAW project, the team members who participated in the preparatory network had a clearer idea of what to expect compared to the team members who joined after the fully-funded project had started. The findings suggest that many of the users did not have any specific expectations, and they joined the project with an open mind, so a clear difference can be seen between the team members and the users. It is understandable that the professionals, whose job the project was, had stronger expectations than the users, many of whom were almost accidentally involved with the project after a body sizing scan.

The findings indicate that the project proposal for the DfAW project was written to cater to the individual interests of those who belonged to the preparatory network. It might be a good thing that people can have their say about the goals of a project and what they want to do, but the lack of clarity over common goals and false expectations

can hamper the process. The co-design project team can even have brainstorming sessions in the beginning to map out all of the ideas, but it is important to agree about the goals that are supposed to be achieved.

## **Clear objectives and project scope**

*Finding: All stakeholders need to understand the vision and objectives to aim for the same goal.*

Covey (2004) suggests that a vision is built from need and possibility. Covey (2004, p.65) states the following:

*“Vision is seeing with the mind’s eye what is possible in people, in projects, in causes and in enterprises.”*

In the DfAW scheme, the project lead had a great vision, but that vision is not enough – it also needs to be shared with stakeholders in a way that makes them understand the objectives clearly. There was at least a partial failure in delivering clear objectives to the project team and users. Several team members stated that it was unclear to them ‘what was supposed to happen’. The biggest failure happened when delivering the vision and clear objectives to the UAG members, because they were unexpectedly substituted by the URG, leaving them without an assigned task. Advisors felt frustration when they did not understand what their role was and if their contribution made any difference. According to the findings, clear objectives and a shared understanding of the aims are the most crucial factors for the success of a co-design project. It is the role of the project lead to deliver the project objectives to the team members so that the team can communicate them clearly to the users.

Having clarity in the objectives has three different viewpoints: clarity in one’s own objectives, clarity about others’ objectives, and clarity over the whole project’s objectives. This will be discussed further in the communications section, but it is



important to communicate about progress and the achievement of goals during the project.

## **Activity planning**

*Finding: Co-design activities need to be planned carefully beforehand.*

Chambers (2011) suggests that the team needs to consider how to prepare the workshops and whether they need outside help. Holston (2011, p. 138) states the following:

*“Once the organization has determined its mission and vision, determined its goals, and done analysis of both internal and external factors, they can start to break down the goals into actions.”*

The previous quote highlights the fact that became evident in the DfAW project. No activity planning can substitute for poor vision and goal-setting. The UAG is a good example of this. The advisory meetings were carefully planned, but still the advisors were confused about their contribution. On the other hand, the URG members were to some extent aware of the general goal, and, therefore, they tolerated more poor activity planning. Some team members called the workshops chaotic, but only a very few users were disturbed by that fact. According to the data, it would be a good idea to plan the whole series of co-design workshops before starting them. Some co-design methods are more suitable in the beginning and others when the users are more educated.

A co-design project can consist of a series of co-design workshops. It is important to design the big picture in a project, but also to design and structure each co-design workshop carefully. Ideally, the sequence of co-design workshops would have a logical basis, and each workshop would build on the learning and results of the previous one. The observation of the DfAW project indicates that it would be good to analyse the

findings of each co-design workshop as soon as possible after the workshop, and design the following one in detail according to the findings. There needs to be a balance between doing enough detailed planning beforehand and then being able to adapt to changes during the project. The advisors proposed that it would have been beneficial to tell them at the beginning of each workshop how the design was progressing and what had been learned, and in that way keep them updated.

## 2. Co-design methods

*Finding: Suitable co-design methods need to be selected and rehearsed before the actual co-design workshops.*

This section reflects on the findings regarding the co-design methods and facilitation in relation to the existing literature. There are a wide variety of co-design methods. For example, Chambers' *'Participatory Workshops'* (2011) and Martin and Hannington's *'Universal Methods of Design: 100 Ways to Research Complex Problems , Develop Innovative Ideas, and Design Effective Solutions'* (2012) books describe several co-design exercises well. This study does not discuss all of the available methods, but only those used in the DfAW project.

Botero and Hyysalo (2013) advocate starting with social practices. These are sometimes called ice-breakers. Iacono and Marti (2014) claim that playing together helps participation. In the DfAW, there were not any specific ice-breaker games, but there was an opportunity meet and greet other people before starting. It is important that people get to know each other, because it helps with expressing opinions in co-design practices. Iacono and Marti (2014) highlight the importance of a friendly and relaxed environment that they call a 'family atmosphere'. Therefore, co-design methods are not only about creating design, but also about warming up the group ready to do collaborative design.

It is very important to have several co-design methods available for use, and an experienced facilitator can vary the methods according to the group if a method does

not seem to work. Botero and Hyysalo (2013) propose starting with a relevant, but small design task. They (2013) explain that it helps users to identify if collaborative design is their 'thing' before going any further. In the DfAW project, users were not really asked after the co-design workshop how they felt about it. Some users dropped out and this could possibly have been avoided if they had been able to express their feelings. One user who dropped out confessed to a team member that he did not feel needed. This was something that could have been addressed better after each co-design workshop, and is very clearly a matter of facilitation. Massimi, Baecker and Wu (2007) recommend offering alternative methods for older people, because of possible differing disability levels. They also recommend subgroups with different capability levels to overcome individual incapacity. This was not especially acknowledged in the DfAW project, but to my knowledge there was nobody with a clear disability that would have hampered the collaboration. Therefore, it is important to find out if somebody has some sort of disability, because they are not always obvious. For example, difficulties in seeing, hearing, dexterity or memory might not be obvious to other people. Nedopil et al. (2013) suggests that it is vital to consider the aims of the co-design methods and why a particular method is used. Another point is how the co-design workshop fits into the longer-term processes of learning and change (Chambers, 2011). In the DfAW project, there was a planned learning curve with the co-design workshops starting from each layer of clothing and continuing to the colours and details of the garments.

In the DfAW project, the project lead chose the co-design methods that she wanted to apply with the URG. The 'show and tell' method was a traditional focus group method. People sat around the table and, on their turn, presented their personal piece of clothing to the group. The benefit of this method was to give everybody a turn to speak. The downsides were people getting bored while waiting for their turn or building the pressure for the last speakers. Chambers (2011) introduces the term 'energizers'. By this, he means exercises which wake up the teams, break the ice and are fun to do.

This section discusses the co-design methods used in the DfAW project and the factors that need to be taken into account when selecting appropriate co-design methods. As described in the Findings chapter, there is a wide array of methods that can be used to create collaborative design. In an optimal situation, the whole co-design project and each co-design workshop are designed beforehand, and the selection of methods fits together logically. Botero and Hyysalo (2013) recommend switching working periods with lighter engagement exercises. In the DfAW project, participants had breaks and a lunch hour to give them the opportunity for quiet time or to socialise, according to people's wishes.

According to the interview data, the sequence of co-design methods worked well. The co-design workshops were designed to cover each layer in functional clothing as well as the colour and design details. There was some evidence to suggest that the analysis of the co-design workshops should have been done directly afterwards. Learning all of the possible information from each workshop could have avoided unnecessary repetition. It was suggested that good practice would be to make a summary in the beginning and at the end of each workshop to share what has been learned and where the project is heading next. The following subsection discusses the evidence on each co-design method that was used in the DfAW project.

## **Show and tell**

*Findings: Going round the table can be boring for participants.*

As explained earlier, the 'show and tell' method involved users telling the group about their current outdoor clothing, what features they liked and what did not work. Interviews and observation data revealed that it was a rich source of information, but it leaves a significant responsibility with the designer to interpret the data because the users might not agree with each other and can have contradictory opinions. However, the advantage of the 'show and tell' method was that all of the users had their turn to talk about their experiences of their walking gear. As a downside, it was observed that

the explanation round took quite a long time, and some users got bored of listening to the others' experiences, which started to repeat themselves after a while. The following section discusses the method that was used to evaluate the recently produced garments.

## **Evaluating existing garments**

*Finding: Tasks that are too complicated or monotonous can be difficult for participants.*

In contrast to the 'show and tell' method, which was a round-table discussion about the outdoor garments that the users owned, the evaluation of the outdoor brands' new garments was done on evaluation sheets. As explained in the Findings chapter, the outdoor clothing manufacturers lent the project their newest outdoor clothing samples. The garments were photographed and numbered. The evaluation sheets included the photographs of the garments and space for a written evaluation. The users were supposed to look at and feel the garments and write their opinion on the sheets.

The most important advantage of this method was the possibility for the users to become familiar with the latest innovations in outdoor clothing. In that sense, the method was educational. However, this method also had some drawbacks in the way it was carried out. Firstly, there were too many garments at the same time. The users felt that they did not have enough time to write a good evaluation. One of the users expressed that she felt stressed because she had difficulties in finding the correct garments from the sheets. Secondly, monotonously filling in the forms resulted in answers that were too shallow, e.g. 'that's nice'. As a suggestion for improvement, it might have been a good idea to introduce the features to the users and have a group discussion about them. Another difficulty was caused by the sizes of the garments. Because most of the garments were sample sizes, they did not fit the users, and it was difficult for them to evaluate sizing and fitting. However, it might be very difficult to

get clothes that fit all of the participants if size was not one of the criteria according to which the participants were selected.

As far as different co-design methods are concerned, they involve a different amount of decision-making from the participants. 'Show and tell' type of methods give most of the responsibility to the designer. The users only tell of their personal preferences and improvement ideas, and it is the responsibility of the designer to synthesise the results. This is not the case with collaborative design methods, which require the users to have good social skills and the ability to make compromises. For instance, when the users designed a seamless base layer in groups, they needed to reach a consensus and leave some suggestions out. If this is not facilitated well, it might cause disagreements among the users.

### **3. Facilitation of the workshops**

*Finding: Facilitating co-design workshops requires skill and experience.*

This section is a continuation to the previous one, which discussed co-design methods. At least as important a factor as selecting the right co-design methods is the effective facilitation of the workshops. Iacono and Marti (2014) highlight the importance of facilitation in co-design workshops. The facilitator's role is crucial in how events turn out. Facilitation is a separate skill, and a non-experienced person should not take the responsibility for workshop facilitation without the appropriate training. According to the findings, the team members who did not have any previous experience in co-design workshop facilitation would have appreciated training in this. Unfortunately, in the project team there were only two team members who were professionals in workshop facilitation, and they did not manage to deliver all the needed skills to the other team members.

On the other hand, this is understandable, because they were not originally responsible for team training. Instead, they were supposed to be responsible for the user group facilitation themselves. The Salford user group (UAG) was overridden and a

replacement implemented (the URG), which was imposed and led by team members at the University of Wales, who were not trained for the job. This meant existing skills in the project team were not utilised. In the section that follows, it is argued that the facilitator's role and responsibilities are crucial for the success of the collaborative design project.

## **Facilitator's role and responsibilities**

*Finding: The facilitator has several tasks to handle simultaneously.*

As pointed out previously, the facilitator has an important role in co-design workshops. The job description includes keeping up with the schedule, delivering and following the agenda and inspiring the attendees. Time keeping might seem of minor importance, but it is surprisingly significant for a positive experience. According to the findings, users appreciated starting and finishing at the time that had been agreed upon and communicated beforehand. Meeting the exact starting and finishing times is a sign of appreciation towards the attendees, but it is only one aspect. Timekeeping is also needed during the workshop. The available time needs to be realistically divided between the different methods and breaks. If the day's agenda is designed to be too full, everything feels too rushed, and users feel pressured to achieve more than they are capable of.

Time is also needed for a thorough debrief and closing summary. Regarding finishing the workshop, users stated that they would have appreciated proper feedback on how the day went and how they achieved the goals during the day. The importance of breaks is also noteworthy. Frequent breaks are needed to sustain attention and efficiency. Catering is discussed in depth later, but the evidence suggests that the attendees appreciated the drinks and food during the breaks. A co-design workshop that lasts an entire day requires a lunch hour. Appreciation for attendance can be shown in many ways, but catering is a good way to thank the users. It also helps with efficiency and socialising when people do not need to find their lunch elsewhere, and

can use the lunch hour for socializing with each other. The evidence suggests that when the users are familiar with each other, they have more courage to actively participate in the design discussion.

The role of the facilitator is also important in considering all the users. Iacono and Marti (2014) highlight the importance of listening skills. They emphasise that a facilitator should not only listen emphatically without judgement, but also talk clearly and demonstrate shared language. This is needed to build trusted relationships with users (Iacono & Marti, 2014). Williamson et al. (2015) mention that it is good to convince users that there are no 'stupid questions'. Another important role of a facilitator is to 'minimize crosstalk' (Massimi et al., 2007). This was not fully successful in the DfAW project. Some people are naturally more extroverted than others. The responsibility of the facilitator is to ensure that a few people do not dominate the discussion and that everybody has a chance to express his or her opinions. This is needed to avoid 'unequal power' (Van Mechelen et al., 2014). Other phenomena that Van Mechelen et al. mention in co-designing with children are 'free riding' and 'laughing out'. This was not obvious in the DfAW project. Certainly, some people were more involved, but nobody disturbed the work by not taking it seriously. The other two phenomena – 'apart together' and 'groupthink' – were more common. Sometimes, people worked in small groups and it was pulled together artificially. In interviews, some people confessed that they felt that they needed to hold back and give other people a turn to speak even if they felt that they had significant things to add. Although Van Mechelen et al.'s six factors were identified in co-designing with children, it seems that they are applicable with older people too.

The facilitator's role becomes even more important when users belong to a special group with possible disabilities. In this case, older people might require some extra attention because of hearing and sight challenges or a lack of motor capability. Massimi, Baeker and Wu (2007) recommend that facilitators 'speed up or down' according to the group's needs. It is also a very important skill for a facilitator to read the group. Some of the users said in interviews that they felt rushed in some exercises and that they needed more time. Iacono and Marti (2014) suggest that it is not a good



idea to acquire all the knowledge wanted from older people at once. Learning to use a product can take time, and goals that are too ambitious are not user-friendly. Massimi, Baeker and Wu (2007) also propose having individual and group sessions. This was not considered in the DfAW project.

The responsibility of the facilitator is also to choose a suitable discussion method. As described in the findings, the three main styles are: going round the table and giving everybody a chance to speak in the users' seating order, having a free discussion without interference, or having people ask for a turn to speak. Variations of these can be used in the big group, or the attendees can be divided into smaller groups which deliver a summary of their discussions to the bigger group. These styles cannot be put in a ranking order, because the most suitable method depends on the group. Some people can find it relaxing that they do not have to ask for a turn to speak and they will automatically get a chance to speak, whereas others can feel that waiting for their turn is boring or even stressful. It can also be stressful if the user feels that their answer has already been heard and they do not have anything new to bring to the table.

In this project, the advisors in particular commented that they would have liked more equal facilitation, where the facilitator ensured the same speaking time for everybody. Looking at the video tapes from the co-design workshops, some people seemed bored or zoned out from time-to-time. The facilitator requires good observation skills to adjust the mood of the group and should use appropriate methods to inspire participants if they look bored. The toolbox of the facilitator should have a wide variety of co-design methods and techniques to inspire people to participate. The worst scenario is if some users feel unappreciated and get the feeling that they do not have anything to contribute. In the following section, I will discuss how this affects continuity of participation, and why this is important.

The data revealed that the facilitator has a significant role in the success of co-design workshops. Facilitating co-design workshops is a skill in its own right and requires

training. Chambers (2011) has created a list of common mistakes a facilitator can make, outlined below.

#### Flapping before the start (Chambers, 2011)

It is important to complete preparatory work well in advance of the workshop. Chambers (2011) states that failing to do so will cause rushing around and failing to greet people when they come in. Other consequences are trouble with the recording technology, problems with setting the room and a chaotic start. In particular, rushing around and not being ready when the users arrived were the most obvious mistakes in the DfAW project.

#### Spinning out the start (Chambers, 2011)

Chambers (2011) suggests that going quickly into the substance of the meetings is important. This also became evident in the DfAW project. When the start is delayed, there is often a risk that the project will not be able to finish at the planned time. Some advisors gave feedback that going through all the health and safety issues was boring and they would have preferred a faster start.

#### Putting down participation (Chambers, 2011)

Asking stakeholders' views is important, but then ignoring those opinions can be very upsetting (Chambers, 2011). An example of this was the project lead, who generally disregarded views which were not aligned with her own opinions.

#### Messing with microphones (Chambers, 2011)

Chambers (2011) also points out the importance of the correct use of the microphone, i.e., not forgetting to use it or failing to switch it on. There was no need for a microphone in the DfAW project, so this wasn't an issue.

#### Grotty gear (Chambers, 2011)

Functioning technology and assisting material is important. Modern conference rooms have very sophisticated technology, and it is important to test it in advance.

#### Muddling and missing things (Chambers, 2011)

The preparation for and practising of presentations and workshops is important. It is very frustrating for participants if the presenter is unable to properly deliver the presentation. One example of this is to make mistakes with slides and to skip over them. Without previous practice, the presentation may not be convincing, which affects credibility.

#### Presenting too much (Chambers, 2011)

This is related to the previous point and means presenting too many slides without enough explanation. It is crucial to determine beforehand what is relevant. Nobody commented specifically on the presentations held in the DfAW project, but in the team workshops this issue had caused some frustration.

#### Not answering questions (Chambers, 2011)

It is a mistake to promise to answer questions at a later stage and then fail to do so (Chambers, 2011). This gives participants the feeling that they are not valued. Nobody in this study mentioned that their questions were not answered. In general, users thanked the team for being able to get answers to their questions.

#### Monopolising (Chambers, 2011)

Chambers (2011) states that one mistake a facilitator can make is to use up all the available time for presentations and exercises, and to fail to make space for others to contribute and share. Sometimes the workshops were so rushed that the participants were not able to express their opinions.

#### Tolerating terrible talkers (Chambers, 2011)

Giving certain people too much time to speak at the cost of others is also a possible mistake made by a facilitator (Chambers, 2011). This happened in both user groups. It is crucial that the facilitator gives quieter participants a chance to speak as well. Another point is to limit the conversation to the matter at hand. Sometimes people like to stray off-topic, which consumes valuable time.

#### Getting rattled (Chambers, 2011)

Chambers (2011) lists losing the plot, panicking, reacting defensively to questions and struggling to keep going as examples of getting rattled. It is a very important point not to get defensive, even when participants express criticism.

#### Hypocritically prattling, pontificating, preaching (Chambers, 2011)

Talking down to users and other ways of underestimating them are also mentioned as mistakes by Chambers (2011). Nobody likes preaching, and it makes users feel uncomfortable. According to my data, this was avoided in the DfAW project.

#### Distracted and distracting behaviour (Chambers, 2011)

Chambers (2011) reminds us that the facilitator also needs to remember their body language. He gives examples of manic impatience, waving arms and tearing hair. It is also very important to have coherence between words and body language. Some of the facilitators' presentations were a bit fast, but this was not a big problem in the DfAW project.

#### Insensitivity (Chambers, 2011)

Sensitivity is an aspect in which it is easy to fail unintentionally. Sometimes following cultural norms can be difficult. In general, the facilitator should be sensitive to people's background, problems and culture (Chambers, 2011). For example, older people can have impairments, such as hearing or vision, that they are ashamed of and do not want to be announced for everybody.

#### Not meeting people, rushing, being rude (Chambers, 2011)

Chambers (2011) says that being busy and abrupt between sessions is rude. He warns facilitators about being preoccupied with preparing for the following part of the programme, and finds that promising to return to their point later might seem contradictory and even offend people (Chambers, 2011).

### Digressing (Chambers, 2011)

All of the examples Chambers (2011) gives about digressing can hamper effective work. These include adding sections, indulging in anecdotes, going off at tangents, forgetting things to cover, flapping and then running out of time. This returns to the subject of preplanning with the team. All of these occurrences took place during the DfAW workshops, but only some participants found them concerning. The interview data reveals that some of the users thought that these were natural traits in co-design workshops.

### Squeezing the breaks (Chambers, 2011)

Squeezing the breaks comes down to making realistic time schedules. Chambers (2011) says truncating coffee and lunch breaks by making them too short is a mistake. Good schedule planning and enough long breaks can enhance effective working.

### Failing to finish off (Chambers, 2011)

Chambers (2011) states that one of the mistakes is failing to tie it all together to make sense of the day. If the schedule is too rushed, there is no time for important reflection and thanking participants. This was one of the biggest pitfalls in the DfAW project. Most of the co-design workshops ran over the given time and stressed users, who had made plans according to the given schedule.

The two last pitfalls that Chambers (2011) names are doing damage and leaving things behind. These come down to good preparation as well. It is important to read manuals so that the facilitator does not break the technology. The last one is quite obvious, but it is easy to forget things and leave papers behind after a long day. It is crucial to keep all the data safe. In conclusion, Chambers (2011, p. 8) states the following: *“Don’t rush, lecture, criticize, interrupt, dominate, sabotage or take yourself too seriously.”*

Chambers (2011) also made a list of good qualities in a facilitator. His advice starts from introducing yourself and is related to good behaviour in general. He advises the facilitator to always use his or her best judgement. The facilitator should empower and support the participants, as well as respecting them without talking down to

them. The facilitator should be self-aware and self-critical. He also encourages participants to embrace errors and learn from mistakes.

## **Continuity of participation**

*Finding: Continuity of attendance leads to effective co-design participation.*

Having discussed the importance of facilitation, it is worth noting the significance of continuity of participation. If the co-design project is planned to be a series of workshops which lead from one to another, it is important that the users commit to participate for the whole project. The problem with the users in the DfAW was that there was no holistic plan from the beginning, and the users did not know what they were participating in. Most of the users had come to a body scan and were invited to participate in the first co-design workshop. None of them knew how large the project would eventually be. This led to some problems; some people only participated a few times and quit without any specific notification, and at the same time some users got involved in the middle of the project. The challenges that followed from this were related to resources and user education.

If the co-design project is planned to be a series of workshops that rely on the experience and learnings from previous workshops, it is necessary to find users who can commit from the beginning to the end of a project. The downside of somebody quitting in the middle is a waste of education and a spot for somebody with a genuine interest in the project. Additionally, if somebody joins in the middle, they need extra education and updating. Of course, this cannot be avoided completely, and people need to have the option to quit at any stage if their life situation changes and requires it. Quitting for a personal reason might not be avoidable, but it should be the desired goal that nobody quits because they feel unappreciated by the facilitator or the project team. Another point on the importance of continuity in participation is that

repeating the topics already covered frustrates those who have participated from the beginning, and wastes energy and time resources.

It is the facilitator's responsibility to show appreciation for the participating users and tell them that their input is valued. However, regarding the findings, reassurance alone is not sufficient. Advisors said in the interviews that they could not have been more reassured that their participation was valued, but because they did not see the big picture and see goals being achieved, they still felt that they received their advisor payment under false pretences. In the following section, I will discuss the findings concerning the selection of the right combination of participants.

## **Selecting participants**

*Finding: The right selection of participants helps to gain meaningful results.*

As pointed out in the Findings chapter, the importance of selecting a good combination of participants cannot be ignored. The findings revealed that biased participant selection is easy to do even unintentionally. There are a huge amount of factors that need to be taken into account when choosing participants: age, gender, race, geographical location, relationship and experience with the researched topic. The selection is obviously dependent on who the organisers want to participate in the design process. As explained earlier, the term 'lead-user' refers to users who are well-informed about the topic and know a lot about the products beforehand. However, sometimes it might be important to also consider participants who are not experts or who might not have any experience at all with the topic. For example, the rationale behind the DfAW project was to encourage older people to walk more, through having well-fitting, aesthetically pleasing outdoor clothing and wearable technology, and it could have been beneficial to ask those who did not already walk what obstacles they face in doing so.

Another interesting observation was that all the participants in the walking groups had the same ethnic background, and it would have been interesting to investigate why outdoor walking is only preferred by white British pensioners. It could be that the clothing or equipment is not the reason for other ethnic groups' non-participation, but this could have been examined.

Another result presented in the findings was that the project lead invited her personal friends (staff working with walking/outdoors brands) to participate in the research. It is up for debate if favouring personal friends is acceptable in academic research. From the brands' point of view, they can, of course, do co-design with users they have specially selected, as long as they are aware that the results may be biased because of that.

In addition to the individual participant selection, it is important to consider the combination of the people. As mentioned earlier, familiarity between users might encourage them to express their opinions in group discussion situations. On the other hand, some topics might be difficult to discuss with friends. Another point to consider in the combination of participants is avoiding cliques. For example, half of the UAG belonged to the same walking group, which made other people feel a bit like outsiders. The clique can potentially also have a dominating effect when they support each other's opinions and ignore others. The problem of cliques might be avoided by only selecting users who do not know each other beforehand, although people are good at finding allies for themselves, so it is not a guaranteed method either. On the other hand, many of the advisors who belonged to the same walking group stated that they would not have participated alone.

Summarising the experimental evidence on participant selection, it is clear that intentional bias should be avoided. Having discussed all the aspects of co-design, the next section discusses collaboration in co-design projects.



## **B) Collaboration**

*Finding: Effective collaboration is crucial for a successful co-design process.*

This section presents the discussion concerning cross-disciplinary collaboration and the importance of clear and transparent communication. The findings indicated that a successful design outcome and user engagement require smooth collaboration between team members and project partners. The first subsection starts with findings regarding how the partners viewed their roles and responsibilities. The second subsection concentrates on the findings concerning team building and the importance of the partners knowing not only the other stakeholders and their roles and responsibilities, but also the other stakeholders' personal aims and interests. The third subsection discusses the findings concerning communication and the need for a communication plan. The final subsection discusses the findings concerning shared language and sharing disciplinary knowledge.

### **1. Roles and responsibilities**

*Finding: Everybody needs to know their own and others' roles and responsibilities.*

Pennington (2002) states that poor leadership and power struggles hamper effective collaboration. Independent of the leadership style, it is important to know who is in charge and who can be asked for advice. The challenge that occurred in the DfAW project was not having adequately specific job descriptions. The project lead had a big vision, but she was not fully capable of communicating what was expected from the team members. This caused confusion and frustration. Holston (2011) has a similar view on the common reasons which cause frustration. He (2011, p. 51) lists five reasons, which are: the *“project running off in the wrong direction, rework and constant updates, changing direction midstream, a new stakeholder signing onto the project late and clients playing designer”*. All five mistakes that Holston lists took place

in the DfAW project. The team members changed several times when people signed in late and others left for personal reasons and because of frustration. The personal goals were hazy and changed continuously.

Pennington (2002) states that another hampering factor is when leaders are not willing to give up their power base, despite the fact that they are not capable of carrying the responsibility. In the DfAW project there were people who had more experience in project leadership, but the project lead did not want to delegate and share the position of power.

As pointed out in the introduction to this section, a universal awareness of roles and responsibilities is crucial for successful collaboration. According to the findings, it is crucial to understand one's own role, responsibilities and objectives, but it is also very important to know the other team members' and users' roles and responsibilities. As far as roles and responsibilities were concerned, the findings from the interviews reveal that having two user groups caused the most confusion. The UAG members, who did not have a specific role or objective, suffered a great deal when they did not understand what was expected of them.

The roles and responsibilities are strongly influenced by effective communication. Communication is needed so that nobody is expected to do something that they have not understood to be their responsibility. There were several examples of this in the DfAW project. The project lead expected the team members to complete tasks that they had not understood to be on their plate. Avoiding this pitfall requires good and transparent communication, and clear directions. Secondly, transparent and effective communication regarding roles and responsibilities is needed in order to avoid duplicate work. A very common mistake is that different teams work on the same topic, and real collaboration is missing.

## 2. Team building

*Finding: Team building is a skill, and teams do not become good teams accidentally.*

Team building is an important phase in the beginning, but it is also a process. As mentioned earlier, Botero and Hyysalo (2013) recommend starting with social activities. This is applicable both at the beginning of the project and the beginning of the individual co-design workshop. Franz (2012) named 'unprepared team members' as one of the hampering factors for team working. Team members need to have good orientation for their role in the team. Enthusiasm and team spirit also need to be maintained during the whole project, but poor orientation can ruin spirits. This is what happened in the DfAW project. Some team members stated that they were enthusiastic in the beginning, but poor organisation left them confused and frustrated. Pennington (2002) states that there are two main reasons behind conflicts in small groups. He (2002) divides them into organisational and interpersonal. This is supported by Franz (2012), who states that an inappropriate team structure for the task can hamper collaboration. Examples of organisational or structural causes of conflicts are competition over shared resources, uncertainty about responsibilities, interdependence between subgroups, different rewards between subgroups, and power relationships (Pennington 2002). In the DfAW project, these issues all took place in one form or another. A very clear issue was the uncertainty of responsibilities, individual and common goals and deadlines. Hackman (2002) agrees with Pennington, stating that 'teams need compelling direction', which requires clear goals. Pennington (2002) claims that a lack of equality between people can also cause major conflicts. He (2002) claims that serious problems are caused if people feel that they are not treated with respect, which is one of the key interpersonal causes of conflict.

Van Mechelen et al. (2014) found that 'unequal power' hampers co-design working with children. My findings show that it is also a hampering factor with older people. Some people were more vocal in co-design workshops and quieter people remained silent. Hackman (2002) states that teams need the right number of the right people.

My findings agree with Hackman's statement. By the right people, he means the right professions, but also the right personalities. It is important in team building that team members get along. Otherwise there can be issues around poor or faulty communication between the members of the group, and inappropriate and destructive criticism within the group (Pennington 2002). The interview data reveals that some team members were offended by inappropriate criticism, and two team members left the project before its end. 'Dysfunctional conflict' (Van Mechelen et al., 2014) and 'high interpersonal conflict' (Franz, 2012) both describe personal conflicts between people that should be solved when they arise. This was not the case in the DfAW project. When conflicts arose, they were left unsolved and nobody talked about them with stakeholders. Things were discussed behind people's back. Everybody knew that there were conflicts, but they were never discussed openly or addressed.

It has commonly been assumed that to collaborate toward a common goal, team members need to get along. Examining the evidence, team building is an activity that does not guarantee results and requires careful planning. In review of the interviews and observation, it is evident that the team-building workshop in the DfAW project did not fulfil its objectives.

There were several factors that should be considered as potential contributors to this result. Firstly, all the team members were not aware that a team-building workshop would take place, and they felt that it was forced on them. Secondly, the team-building exercise (facilitated by an external facilitator) was executed too late in the project lifecycle to be effective, and thirdly, the team members did not feel comfortable enough with the environment to safely express their feelings. Following the workshop, it was discovered that the facilitator was related to one of the team members (spouse), and this generated suspicion, as members had been asked to reveal their views about problems in the project. A possible explanation for the resulting damaged feelings arising from the personal development tool and team-building exercise could be that the activity was not agreed with the project lead and other team members prior to the activities, and came as a surprise to the majority of the participants.

The observations of the workshop included revealing that, in principle, sharing personal goals and ambitions could help other team members understand colleagues better and help them to understand that others' goals could differ from their own. The workshop also brought to the surface the existence of three main interests in the project: learning, academic recognition and equipment improvements. The challenge for a project lead is to identify an approach that recognises personal ambitions alongside common goals.

The results would seem to suggest that team building should be completed as an ongoing activity throughout the project rather than a one-time event. Observations suggest that personal conflicts are resolved more simply if they are addressed when they arise. If these conflicts are left to develop, greater damage to team members' feelings can result, which will require more complex mediations. A potential method that could have been deployed would have been to establish a conflict resolution approach as part of an overall crisis plan when developing the initial project framework, and align all team members to this approach. Hackman (2002) proposes that teams need 'supporting organisation' and 'expert coaching'. This could have helped the DfAW project team.

### **3. Communication**

*Finding: Open communication is a precondition for good collaboration.*

Pennington (2011) states that poor or faulty communications between group members is one of the common causes of interpersonal conflict. Pennington (2011) argues that:

*"Fundamental to social interaction is communication between members of a small groups as well as communication with others outside the group."*

Pennington (2011, p. 12) continues by defining communication “as the process by which an individual (or group) transmits information about ideas, feelings and intentions to another person.” In groups, communication can have the purpose of “controlling group members, expressing emotions, motivating others and exchanging information.” Communication has a sender and receiver, and it can be transmitted by multiple different media: for example, verbally, in traditional print format, or electronically. Unfortunately, communication can often be easily misunderstood or misinterpreted (Pennington, 2011). This was also the case in the DfAW study. There were multiple cases where a communication event was misunderstood or misinterpreted. Chambers (2011) named honesty and transparency as some of the characteristics of a facilitator. Franz (2012) mentions ‘miscommunication’ as one of the six hampering factors for team work. Miscommunication can have various reasons behind it, and it can be purposeful or unintended. In the DfAW it was both. Some things were misunderstood unintentionally and some were purposefully miscommunicated. This led to ‘faulty decision making’, which is also one of Franz’s (2012) hampering factors. Another downside of miscommunication is that it leads to false expectations, which is something that should be avoided (Botero and Hyysalo, 2013). In the DfAW project, some users had false expectations about what was going to happen, and this caused disappointments. For example, some UAG members believed that they would get products to test, and when this did not happen they were dissatisfied.

Pennington (2011) states that people bring past experiences and pre-existing knowledge to bear in interpreting a message. He also adds that emotions can affect how communication is understood. This became evident in the DfAW project as the more that people developed hurt feelings, the less willing they were to understand others. One of the team members stated in the interviews that a communication plan could have been organised easily, and that it was a shame that this did not happen. When the communications software did not work as planned, a backup approach should have been implemented to maintain an organised communications process. The key finding and conclusion of this section, in light of the research question, ‘What are the factors that facilitate or hamper co-design projects?’, is good communication,

a willingness to understand others and a friendly, positive atmosphere with a good spirit.

One of the best insurance measures when creating a successful co-design project is an effective, meaningful, respectful and transparent communication process. When each member of the cross-disciplinary team is a professional in their field, ineffective and inefficient communication can be the most significant factor in hampering progress. Communication can be aided with successful team building. As a project progresses, the project lead can hold the pivotal role of ensuring that everybody is aware of their roles, expected job requirements and deadlines, as well as developing an understanding of how the team members perceive their work. To correct a poor working atmosphere is significantly more difficult than maintaining a good spirit in the team. Poor communications cause misunderstandings and hurt feelings, and these take time to repair.

## **4. Project management software**

*Finding: Good project management software can aid working, but poor software can hamper it.*

Franz (2012) names 'poor coordination' as one of the hampering effects for co-design. Coordination is very strongly linked with the use of project management tools. It is probable that most large projects with an extended timeline require project management software. According to the findings and observations, the DfAW project failed to select effective project management software and to use it successfully. There are two likely causes: firstly, the project team did not agree on the selection of the software, and this led to a permanent disagreement; and secondly, to utilise the software correctly would have required training. It is unrealistic to expect users to be proficient in a complex software tool without the appropriate training.

When the project team is large and distributed across multiple locations, project management software becomes an important asset. One of the team members stated

that he had sent, on countless occasions, his publications to other team members manually, and that it was difficult to keep track of what others had published. Ideally, all of the publications should have been stored in a common repository to be available for all the project team. Additionally, project software could have been utilised to provide a communication portal for upcoming events and a discussion forum.

It is highly likely that one of the key factors impacting the use of the project management software was a lack of sponsorship or use by the project lead and the co-investigators. If it had been mandated or recommended by the project lead, it would have become a norm to work in this fashion. Taken together, these findings suggest that the introduction of new complex software requires attention, to ensure that all of the team members are aware of how to use it and that there is an approach in place to ensure its ongoing utilisation.

## **5. Shared language**

*Finding: Shared language is needed for understandable communication.*

In this section, the discussion centres on shared language and its meaning. The interview findings suggest that shared language was a contradictory term, and all of the participants did not exactly agree on its connotations, yet the DfAW project purported to be seeking it. The most popular view expressed for the definition of a shared language was that it is a shared understanding of the meaning of terms and the language used. Both the team members and users disagreed whether the shared language principle was achieved during the project. In one team member's opinion, the users were more open-minded to learning new things and terms than the team members. It seems possible that this finding is due to the long geographical distances between the work packages. If all of the team members had worked in the same room, a shared language could have been developed more easily.



## **Disciplinary knowledge and specialist perspective**

*Findings: Team members need to share their disciplinary knowledge with other team members and users.*

One of the team members described that he did not have an expectation that others would know his profession in detail, but that a basic level of interest would have been desirable for efficient collaboration. The knowledge of a discipline grows through education and in fieldwork, and sometimes it is difficult to see that another's world view can be completely different. One aspect is that the terms used by the other disciplines are completely unfamiliar, or that the same words are used to express a different meaning. The findings suggest that if a team has never worked together, it is important to spend some time on training at the initiation of the project. There was an attempt to do this, but according to the interview findings, this was not entirely successful. Some of the interviewees claimed after the project that they were surprised about what types of expertise there were in the project, and that they were not aware of it during the project. They felt that the project could have benefited more from utilising this individual professional expertise. This leads to a discussion on how to deliver one's personal expertise. The project setting should encourage individuals to share their knowledge for the benefit of the project team and users. The following section discusses the learning curve that took place during the project.

## **Learning process**

*Finding: A co-design project is a learning process and all stakeholders are both teachers and students.*

The findings seem to suggest that both the team members and users felt that they had learned new things by participating in the project. The team members learned about their own and other disciplines from their colleagues, and also from the users.

The users were encouraged to ask questions if they did not understand. According to the findings, some users expressed that they were confident to ask if they did not understand something, whereas others felt that they did not want to embarrass themselves by asking things. It can be argued that it is important to create a safe atmosphere where everybody can feel confident to ask when something is unclear.

A similar result is found when looking at the opinions regarding a glossary. Some users felt that it could have been beneficial to have a glossary with the most common terms and explanations, whereas others saw it as being unnecessary.

## **Understanding others**

*Finding: Understanding others requires a willingness to listen and understand.*

It is almost certain that the willingness to understand others is the most important factor in successful collaboration. It was suggested that some of the team members did not want to understand others' perspectives. There is a possibility that this hampered the transparent communication necessary for the project to proceed. One example was regarding the Shimmer device, which was needed for the heart rate monitor to transfer its data to a mobile phone. The technology work package staff viewed it from a functional perspective, and did not see the importance of making it user-friendly, whereas the design team saw that the size of the device was a big obstacle in its use. This caused a huge disagreement, and instead of displaying willingness to find an effective compromise and solution, these two disciplines stayed in their corners and the problem was left unresolved.

## C) Setting

*Finding: Consideration of the details in the setting is important for overall comfort during the project.*

This section discusses the findings regarding the setting of the co-design workshops. The section is divided into five sub-themes: Location, Equipment, Time, Hospitality and Finance. These five practical aspects need to be considered before the user involvement starts, and developed during the co-design process.

### 1. Location

*Finding: The location needs to be easily found and user-friendly.*

In this section, the question under discussion is the location of the co-design workshop. The natural location to host an academic co-design workshop is a university, or a clothing brand's office if the co-design project is carried out by an outdoor clothing brand. The evidence suggests that some were comfortable with the university setting, whereas others felt stressed about confusing campus areas and struggled to orient themselves despite the signage. Williamson (2015) highlights good signage as important and gives the example that sometimes it is good practice to meet users at the meeting venue's front door or parking lot. The university can also be seen as having an exciting and positive atmosphere. As one of the users expressed it, 'the oldies are still in the business', meaning that she felt good about contributing to the study and expressing her opinions for an academic study.

The advisory group also visited an outdoor clothing brand's showroom, which they found extremely interesting and educational. One criticism expressed by the advisors was that their contribution felt irrelevant. A closer collaboration with the outdoor

clothing brand would have avoided that feeling. Obviously, if the outdoor clothing brand was carrying out the co-design project, this kind of problem would not appear.

The third option is to rent space in a cafeteria or community centre. The key factor to consider is the users' comfort in attending. In general, the location needs to be well-situated from a transportation perspective.

## **Setting the room**

*Finding: The room needs to be suitable for co-design working and recording the action.*

There are also some general requirements for the room where the co-design workshop takes place. There needs to be adjustable heating and air conditioning, and it should be taken into account that a large group of people heat a space quickly. The tables and chairs need to be positioned to ensure that there is an equal opportunity for all to participate. The following section discusses recording technology and the factors that enable good quality recording. The room layout affects the recording possibilities as does the number of subgroups, and they should both be carefully considered.

The room should not be too small or noisy (UMX, 2014). According to the evidence, the room needs to be sized correctly in relation to the number of participants. If there are too many participants for a room, it can add additional stress to the workshop. It is also important that the space is quiet and that participants do not get distracted by passers-by or other disturbances. UMX (2014) also mentions that creative work is aided by taking place in a creative space; for example, ordinary boardrooms do not encourage creativity.

## 2. Equipment

*Finding: The biggest requirement for recording equipment is that it works as expected.*

The wide variety of co-design methods drives the use of different tools. The most common ones are post-it notes, pens and other equipment to enable brainstorming and other innovation exercises. The obvious requirement of the equipment is that it needs to be of good quality, starting from working markers through to sharp scissors. UMX (2014) points out that it is good to test the projector beforehand and to have everything ready when the participants arrive.

To enable later analysis, co-design workshops are often voice recorded and video taped. The starting point for a successful recording is to have a good knowledge of the equipment and a strategy for handling batteries. This might sound obvious, but the DfAW project proved that it can easily be forgotten. The recording can be challenging when there are lots of people and they talk on top of each other. For analysis purposes, it is important to stress to people that they need to talk clearly and state their name prior to sharing their views. As stated in the previous section, working in smaller groups also created recording challenges, because then each group needed their own recording devices, and it was important that the other groups' discussions did not disturb their recording.

## 3. Time

*Finding: Good timekeeping is a courtesy to stakeholders.*

Timekeeping has already been discussed, and time management appeared to be one of the most important tasks in the co-design project. Time management can be divided into two components: time management for the whole project and for an individual workshop.

The co-design project needs a specific project schedule with milestones and deadlines for the whole project. The project can be roughly divided into the following phases: definition, planning, execution, evaluation and finishing. Each stage should be given enough time, and skipping a stage can lead to unexpected problems. For example, skipping the evaluation stage can significantly reduce the impact of the project. According to the findings, the evaluation stage of the DfAW project was too short, and there was not enough time to complete an in-depth evaluation of the prototypes. The DfAW project team should have taken more care of the time used in the definition and planning stage. The evidence suggests that careful planning can save time and efforts later in the project, time and effort that will be required for the later stages, including the successful completion of the project.

As discussed earlier, the careful planning of each workshop is important and timekeeping affects the experience of the users. The workshops need to have enough time for breaks and a summary report should be given at the end of the workshop. UMX (2014) proposes that each workshop has three phases: opening, actual working, and closing the workshop. Opening the workshop includes the introductions and an ice-breaker game (UMX, 2014). Actual working is finished in good time to give conclusions and thank-yous. The finishing stage also includes looking at the next steps and delivering assignments until next time (UMX, 2014).

## **4. Hospitality**

*Finding: Catering keeps participants' blood sugar and working mood up.*

In this section, the discussion will focus on hospitality, and especially catering. There is overwhelming evidence confirming the idea that catering played an important role in the users' experiences. The results indicate that relatively small things matter to the users. For example, the older walkers in the DfAW project appreciated something to eat with their coffee, and ceramic cups over paper ones. According to the evidence, set standards needs to be maintained. Several advisors remembered the one event when there were no biscuits with the coffee in the morning. This was significant for

them because drinking the coffee without eating might irritate their stomach. Similar issues need to be considered with spices and food allergies. There can also be unexpected setbacks caused by other stakeholders, in this case the catering company of the university. One example was the provision of only cold foods at one meeting, which the advisors were unhappy with.

## 5. Finance

*Finding: The budget should include payment for the participating users.*

There is an ongoing debate with respect to financial remuneration for users' time. In the DfAW project, the URG and UAG members were paid for their travel expenses, but only the UAG members were paid for their time, as only this group was costed into the DfAW project bid. According to the findings, opinions about these payments were wide-ranging. Some users felt that they were happy to participate as this was their hobby and they did not expect any financial compensation, whereas others felt that they were under-rewarded. Satisfaction with the remuneration depends heavily on how expectations were set. Some UAG members expected to get some free gear, even if it was never promised to them.

One question to discuss is whether payment influences results. It can be argued that the user may feel pressured to provide answers that they perceive to be expected from them when they are paid for their time. On the other hand, public involvement guidance is strongly in favour of payment (Williamson, 2006). By the evidence available, it seems fair to suggest that some payment for users' time is justified.

## D) Impact

*Finding: Co-design projects have two main kinds of impact – the impact on the design and the impact on the users themselves.*

This section is divided into two parts. It presents a discussion of the impact that the co-design project had on the team members, and also how they perceived that the users had impacted the design.

### 1. How user participation in co-design impacted the result

*Finding: There should be recorded evidence of how user involvement affected the design.*

In this section, the question under discussion is if the users' participation impacted the result. The interview findings suggest that the team members were convinced that the users played an important role in the design process. Opinion about their contribution among the users and advisors differed. Some hoped that they had an impact, others doubted it and some were not sure. Although users are at the centre of a user-centred design process, according to Pratt and Nunes (2012), there are a variety other factors that need to be taken into account; for example, technology requirements and restrictions, alongside the budget, timeline and different goals for the product.



## 2. How co-design participation impacted users

*Finding: The co-design process is a learning process and has an effect on users.*

The preceding discussion implied that the majority of stakeholders in the DfAW project believed that the users' participation had an impact on the result. According to Williamson (2015), users' involvement can have an impact on confidence, self-esteem, enjoyment and contribution. Everybody agreed that engagement in the co-design project had an impact on the users. All users claimed that they had learned new things; additionally, several users reported that they had made new friends, and all of the users that I interviewed were thankful for the experience. This result could have a favourable bias, because the people who did not have a positive experience dropped out prior to the end of the project and I did not have a chance to interview them.

### Chapter summary

This chapter provided a discussion about the study findings. The chapter starts with the limitations of the study, which were divided into the methodology, methods and personal limitations. This study differs from previous research by looking at the co-design process and considering what needs to be taken into account when running co-design projects. This chapter has put forward a discussion about the findings of this study when compared to the existing literature, if it existed.

# CHAPTER 9. CONCLUSIONS

## Impact on practice and contribution

The co-design process can be highly rewarding for all stakeholders, if it is managed well. Co-design can enhance innovations and give learning experiences for users. This study attempts to reveal best practice for how to conduct co-design studies. Currently, there is neither existing scientific research nor a guidebook for conducting co-design, and therefore this study can be used as guidance on how to do co-design and what to avoid. Balancing the different factors in a user-centred process is challenging and requires extra attention. My unique contribution is to create evidence to inform future guidance for co-design processes using the existing knowledge around public involvement. The most important outcome of this project is to answer the question: ‘what are the factors that facilitate or hamper co-design projects?’.

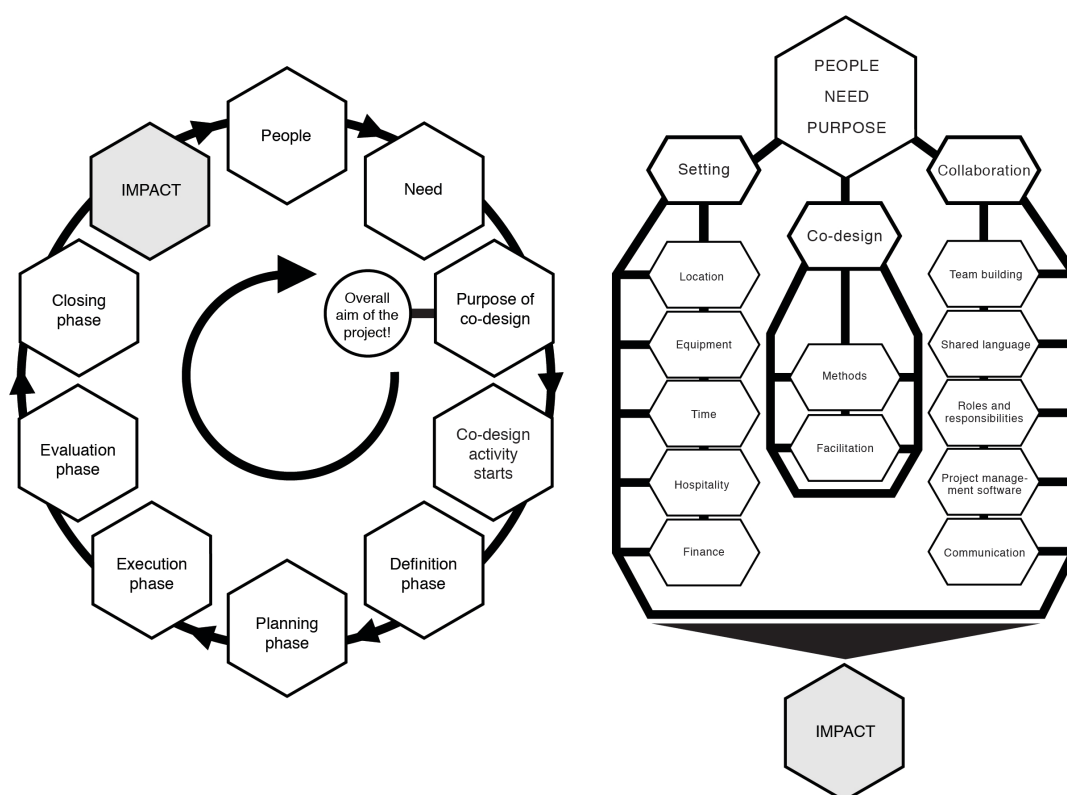


Figure 13. *Concept of co-design*

The unique contribution has also been to create this conceptual map and evidence for achieving effective co-design that involves three key themes: co-design itself, the setting, and collaboration.

My key findings were:

- All stakeholders must understand the purpose of a co-design project for effective collaboration.
- A user centred co-design project needs to be founded on users' needs.
- Selecting the right people and the right number of people to participate is important for the success of co-design activities.
- Understanding participants' motivation helps to facilitate collaboration.
- Participants' expectations influence involvement.
- All stakeholders need to understand the vision and objectives to aim for the same goal.
- Co-design activities need to be planned carefully beforehand.
- Suitable co-design methods need to be selected and rehearsed before the actual co-design workshops.
- Going round the table can be boring for participants.
- Tasks that are too complicated or monotonous can be difficult for participants.
- Facilitating co-design workshops requires skill and experience.
- The facilitator has several tasks to handle simultaneously.
- Continuity of attendance leads to effective co-design participation.
- The right selection of participants helps to gain meaningful results.
- Effective collaboration is crucial for a successful co-design process.
- Everybody needs to know their own and others' roles and responsibilities.
- Team building is a skill and teams do not become good teams accidentally.
- Open communication is a precondition for good collaboration.
- Good project management software can aid working, but poor software can hamper it.
- Shared language is needed for understandable communication.
- Team members need to share their disciplinary knowledge with other team members and users.
- A co-design project is a learning process and all stakeholders are both teachers and students.
- Understanding others requires a willingness to listen and understand.
- Consideration of the details in the setting is important for overall comfort.
- The location needs to be easily found and user-friendly.
- The room needs to be suitable for co-design working and recording the action.

- The biggest requirement for the recording equipment is that it works as expected.
- Timekeeping is a courtesy to stakeholders.
- Catering keeps participants' blood sugar and working mood up.
- The budget should include payment for participating users.
- Co-design projects have two main kinds of impact – the impact on the design and the impact on users themselves.
- There should be recorded evidence of how user involvement affected the design.
- The co-design process is a learning process and has an effect on users.

Most importantly, negative experiences for the users or members of the design team should be avoided. These negative experiences can include a feeling of being used without proper payment or other recognition; stress about being overloaded or fulfilling the requirements of the team; bad attitudes; miscommunication; and the frustration of the project being too complex. The findings reveal that communication plays a crucial role in successful collaboration in co-design, and it should be carefully planned early on in the planning stage of the project. Expectations concerning involvement and project outcomes should also be carefully managed. Delivering clear job descriptions for all stakeholders is also crucial for a successful co-design project. There are a wide variety of co-design methods and it is important to choose the most suitable ones. This study offers insights on the downsides and benefits of some co-design methods that can be used in the future. Sometimes it might be beneficial to carry out a pilot study in order to find the right co-design methods.

This study revealed that carrying out co-design workshops requires a lot of organisation of practical matters. These matters might feel secondary, but they are necessary for successful research and for motivating people to engage. These practical factors include organising the room, setting up the recording devices, and sorting out the catering properly. Good timekeeping is a crucial factor for everybody's comfort. The findings revealed that loose timekeeping can hamper the involvement experience for participants.

The importance of the research lies in the opportunity in the future to guide people into providing positive experiences for people, designers and manufacturing

professionals. Both parties may gain new knowledge and skills in a successful co-design process. All kinds of meaningful participation can make people feel valued and increase their self-esteem. It is highly satisfying to see one's ideas materialising in a finished commercial product. Also, social benefits in the forms of peer support and new friendships can be the result of successful engagement in a co-design project.

## **Recommendations**

The interesting future research area is the concept of silent knowledge in co-design. Silent knowledge means professional knowledge that is not published. A recommended research topic could be the co-design practices currently carried out by outdoor companies. The outdoor companies sometimes work with their lead-users in their design process, but this is not documented publicly, and is focused on input from one or two users. A fascinating research topic would be looking at these involvement mechanisms. The future work includes testing if the concept map, developed through my findings, can be used by co-designers in other co-design activities and in other user involvement fields as well. The concept map can inform the development of guidance for co-designers, which can be made available in different formats including a book, leaflet and online formats.

## **Chapter summary**

This chapter concluded the main findings of this study. It presented the concept of co-design, which is a new contribution to co-design knowledge. This thesis ended with recommendations for future research.

## INTERVIEW QUESTIONS FOR STAKEHOLDERS

**Project title** – User involvement in research, design and development of functional garments for older people: Successes, challenges and learning points

- Tell me about your background experience/expertise that has led you to be involved in the Design for Ageing Well project. What has been your role in the project? E.g.:
  - Older research adviser
  - Researcher – discipline/post?
  - Other stakeholder – please explain

## ROLE WITHIN CO-DESIGN

- Describe any research you have previously been involved in that has a 'design' focus or component.
- Tell me about any multi-disciplinary research projects you have or are currently involved with.
- What was your specific *formal* role in those projects? And in this current DAW project.  
Did you adopt any *informal/unanticipated roles* within the current DAW project? Tell me about those.
- What do you understand by the term co-design?
- Did you have any assumptions / perceptions / pre-conceptions about involvement in 'co-design'?

## INVOLVEMENT IN CURRENT DAW PROJECT

- What type of co-design activities have you been engaged with during the development of the DAW project?
- Tell me your views on each co-design method used (Prompts: e.g. potential, application, utility, effectiveness)

- Were there any other co-design approaches that could or should have been used in your opinion?

#### SHARED LANGUAGE

- The project team has made use of the term 'shared language' during the DAW project. What is your understanding/interpretation of the term?
- Do you think a 'shared language has been evident in the DAW project? Please explain your answer.

#### PUBLIC INVOLVEMENT

- Tell me your views about the public involvement aspects of the study eg Salford User Advisory Group, Wales User Advisory Group, attendance by lay representatives from the ESRC
- How could the public involvement aspects have been improved?
- What contribution (ie impact) do you feel the public involvement made to the research study design, processes and findings?

#### REFLECTION ON PROCESS

- What are your views concerning the multi-disciplinary team working with the DAW project? E.g. relationships, contribution
- What worked well within the project?
- What worked less well within the project?
- How could the study have been improved e.g. in terms of design, partners and public involvement?
- What learning will you take away from the DAW project in relation to design, co-design, multidisciplinary working or other aspects?

## RECOMMENDATIONS / ADVICE TO OTHER STAKEHOLDERS

- Reflecting overall on your experience of the DAW project, what advice would you give to another research team undertaking a co-design study?
- In summary, what would you say are the key elements/principles of good/effective co-design?
- In summary, what would you say are the key pitfalls to avoid to achieve good/effective co-design?

## IMPACT

- What impact do you think that co-design had on the project?
- What impact has co-design had on bringing design to older users?

## SUSTAINABILITY

- What do you understand by the term sustainability? (Definition is explained before next question)
- Is sustainability of outdoor clothing important to you?
- Do you think that co-design can increase sustainability?  
Are there any other issues in relation to your experience on the DAW project you would like to share?



## STAKEHOLDER PARTICIPANT INFORMATION SHEET

**Project title** – User involvement in research, design and development of functional garments for older people: Successes, challenges and learning points

You have been a stakeholder in the Design for Ageing Well project co-design process. This research looks at co-design methods and best practise in co-design process. Therefore I would like to interview you about your experiences of co-design processes in the Design for Ageing Well project. So that you can decide whether to be involved or not, it is important that you understand why the research is being done and what it will involve.

As researcher, I am required to give you information about the following:

- |  |      |
|--|------|
| 1. What is the purpose of the research?                          | p. 2 |
| 2. Why have I been invited?                                      | p. 2 |
| 3. Do I have to take part?                                       | p. 2 |
| 4. What will happen to me if I take part?                        | p. 3 |
| 5. What are the possible disadvantages and risks of taking part? | p. 4 |
| 6. What are the possible benefits of taking part?                | p. 4 |
| 7. What if something goes wrong?                                 | p. 4 |
| 8. Will my taking part in this study be kept confidential?       | p. 4 |
| 9. What will happen to the results of the study?                 | p. 5 |
| 10. Who is organising and funding the project?                   | p. 5 |
| 11. Who has reviewed the project?                                | p. 5 |
| 12. What do I do now?  | p. 6 |
| 13. Contact for further information                              |      |
| p. 6   |      |
| 14. Reply slip   | p. 7 |

Please take time to read this information carefully and discuss it with

others if you wish. Please ask me if there is anything that is not clear or if you would like more information. Take your time in deciding whether or not you wish to take part. **Thank you for reading this.**

### **1. What is the purpose of the research?**

The aim of this research is Identification and analysis of gaps in the evidence base surrounding 'what works' in the involvement of older people in technological research, design and development. The research looks at impacts of the trans-disciplinary nature of co-design process and identification of factors, which aid and hamper effective working.

I would like to interview you informally to gain an understanding of your perceptions and experiences of co-design processes in the Design for Ageing Well project.

In the interview I would like to make written notes, recordings and videotaping of what you tell me.

### **2. Why have I been invited?**

You have been invited to be a participant as someone who was a stakeholder in the co-design process within Design for Ageing Project.

### **3. Do I have to take part?**

No. It is up to you to decide whether and how you would like to take part. You can change your mind at any time and a decision to withdraw or a decision not to take part will not be held against you in any way. If you decide to withdraw afterwards, I will delete your recordings and transcriptions and will not use them in the research.

#### **4. What will happen to me if I take part?**

I will contact you to arrange an informal interview with you, ideally between May and July 2012 at a time and place suit you. I will contact you to arrange a suitable time and venue and can accommodate a telephone interview if you prefer. With your agreement I would like to video and tape record our conversation and make a few written notes. Videotape will be only used for help me to transcribe interviews, because English is not my first language.

On the day of the interview, I will ensure you have a copy of this information sheet and will answer any queries that you have prior to asking you to sign a consent form. The length of the interview will depend on where it takes place, but will likely take around 30-45 minutes.

#### **5. What are the possible disadvantages and risks of taking part?**

There are no expected risks to taking part.

#### **6. What are the possible benefits of taking part?**

I hope the findings will be useful in improving co-design process and have utility to the outdoor and clothing industry to use it in their practices. Co-design can potentially make design more inclusive, fit for purpose and sustainable.

#### **7. What if something goes wrong?**

This is unlikely however, if you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of this study, you may complain to the University of Salford.

## **8. Will my taking part in this study be kept confidential?**

All information, which is collected, about you during the course of the study will be kept strictly confidential, although your anonymity cannot be totally assured as other research team members may recognise you by nature of the answers you give. I will endeavour to protect your identity in any presentation of the findings.

As is common practice, my PhD supervisor would normally have access to full interview transcripts (with your name removed) as she supports me with interviewing technique and analysis. As my supervisor is known to you (XX), please let me know via the consent form whether you would rather she did not see your transcript for these purposes as you may be identifiable to her, in which case she will only see completely anonymised extracts of data.

## **9. What will happen to the results of the study?**

The study findings will be shared in a variety of ways including my PhD thesis, and a local event and local presentations to groups/forums that may be interested. Summaries of findings will be published in newsletters. Articles will be published in academic journals and presented at conferences.

## **10. Who is organising and funding the project?**

The study is being funded by a research funder known as the Economic and Social Research Council (ESRC).

### **11. Who has reviewed the project?**

The study has been reviewed by the University of Salford Research Ethics Panel.

### **12. What do I do now?**

You do not have to decide immediately. Take this information away and read it through with others if you wish. If you are willing to take part as a participant, please contact me.

### **13. Contact for further information**

XX

Researcher

Room XX

XX

University of Salford

XX

Tel – XX

**May I thank you for taking the time to read this information sheet and for considering taking part.**



**STAKEHOLDER Reply slip**

**Project title – Design for Ageing Well**

**Having read the information sheet, I wish to participate in this research  
and want you to contact me at the following:**

Address:

E-mail address:

Telephone number:



22 November 2011

Dear Laura,

**RE: ETHICS APPLICATION HSCR11/8 – PANEL’S COMMENTS**

Thank you for submitting this application for review. The reviewers felt that it was a well-written proposal but that some clarification around data storage, sample size justification, recruitment approach and how each objective will be addressed is needed. Therefore ethical approval is given on condition that the following comments are addressed:

1. Objectives – Please clarify the exact nature of the study. How will each of the objectives be achieved?
2. Rationale – The information sheet seems to have more clarification about the rationale for this study. Please transfer it to the application.
3. Data Protection – Suggest use of an encrypted memory stick. Also consider using the f-drive or alternative secure drive.
4. Other Ethical Issues – Please provide the ethics panel with a copy of the lone working policy you mention.
5. No. of Subjects – How will you identify the walking groups and when will you know if you have enough data-saturation point. Justification of the subject number could be more robust.

Other than providing us with a copy of the lone working policy you do not need to re-submit any documents to the Panel; we do however require that your Supervisor confirms in writing that these comments have all been addressed by Friday 2<sup>nd</sup> December 2011.

Yours sincerely,

*Rachel Shuttleworth*

Rachel Shuttleworth  
College Support Officer (R&I)



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