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# 'Hey, I can do that too!': How skilful participation thrives in a co-sewing café

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#### ABSTRACT

Participants' skills are highly important for a democratic design process, enabling everyone to participate and skilfully use designed tools and methods. This is particularly relevant for matters of participation in extended participatory design (PD) contexts that grow in scope and time span, such as in peer production communities. However, relatively little PD research has been devoted to the relation between skills and participation. Using a case rich in practice, a co-sewing café, this paper aims to understand the spectrum of participation by deeply examining the diversity and interrelation of the skills the participants practised in the café. To analyse the case, the paper compiles a tentative analytical framework based on PD and peer production literature. I ran and documented this 'research through design' experiment over eighteen months, hosting hundreds of participants. The diversity of the participants' skills was elucidated through the rich materials from the practice and then placed along a learning spectrum of skilful participation. The paper concludes with an overview of the different skills practiced and developed in the café and suggests that designing for skill development can contribute to sustaining participation in such contexts.

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Participation; participatory design; skills; infrastructuring; peer production; makerspaces

#### 1. Introduction

Recent participatory design (PD) practice and discourse have focused heavily on the design of 'tools' and methods for facilitating participatory processes. Relatively little research has thus been dedicated to PDs' earlier motivation to foster skills development for reclaiming the knowledge of workers. As tools rely on participants' skills, skills build the bridge between tools and the possible depth of participation. Early PD focused on designing tools and methods for anyone to use so they could participate in the design process on a common level (Ehn and Kyng 1992). These early explorations started in the 1970s in Scandinavia and explored participation and skills, especially those related to technology development at the workplace (Ehn 1988). Voicing PD's democratic ambition that anyone should be able to participate illustrates the role of skills as power in informed and reasoned decision-making and using (or refusing to use) an artefact in a specific way (Bratteteig and Wagner 2014). Skills are thus considered important for PD, enabling participation in design processes (see, e.g. Smith and Iversen 2018). However, certain discussions on PD critique the overly strong focus on methodological and tool development as being too narrow and

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This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (http://creativecommons.org/licenses/by-nc-nd/4.0/), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way. limiting when designing for environments in longer-term PD projects (Vines, Clarke, and Wright 2013; Hyysalo and Hyysalo 2018). For example, the tool focus neglects the analysis of the depth of participation in the PD processes (Gerrard and Sosa 2014), and pays less attention to the notions and development of participant skills as PD outcomes.

In recent decades, the focus of PD has extended from developing technological applications and products with future users towards designing with(in) communities for different scales, environments and extended time spans (referred to as *extended PD* in this paper). When PD extends into, for example, communities of peer production (e.g. FabLabs and makerspaces), new challenges arise. These can include sustaining participation, and the blurring of roles (designer vs user) over time. These challenges demand new means for designing and articulating the processes occurring among designers, users and participants in such contexts. 'Infrastructuring' can offer a bridging concept here, to analyse such processes in PD and peer production communities. In PD, infrastructuring is considered a fluid process, developing over time in different communities and contexts, often related to technology (Bødker, Dindler, and Iversen 2017). PD is hence extending the object of design towards understanding infrastructuring as an aspect of participatory processes (Björgvinsson, Ehn, and Hillgren 2010) which, for instance, help people develop their skills and capabilities (Huybrechts et al. 2018).

The concept of infrastructuring is particularly useful for addressing the necessary flexibility, openness and adaptability required when designing for uncertain outcomes and future uses (i.e. peer production spaces managed by their participants) (Hillgren, Seravalli, and Emilson 2011). The roots of infrastructuring lay in the field of Science and Technology Studies, which shifts the focus from designing for fixed environments, products or technologies towards a dynamic infrastructure that relates to different contexts (Star and Ruhleder 1996). In contemporary PD, infrastructuring is adopted and applied in various ways. For instance, Karasti and colleagues (Karasti and Baker 2004; Karasti and Syrjänen 2004) have described infrastructuring as an ongoing activity, a fluid and dynamic structure enabling and intertwining activities in a process of ongoing development through design and use phases that include adaption, redesign and appropriation (Björgvinsson, Ehn, and Hillgren 2010, Karasti 2014). Seravalli (2012) has explored makerspaces as spaces for infrastructuring, because they offer a dynamically adaptable structure that is redefined as the 'use time for supporting emerging activities.' These designed infrastructures potentially enable users to engage in design activities and are used in the explicit case discussed in this paper: sewing machines, furniture, tools and materials (i.e. fabrics, scissors, irons, etc.), but also the space itself (for more details see: Hirscher and Mazé 2019). In this context, I understand infrastructuring as a process that occurs when diverse participants design and make in a peer production environment, but over time, develop and change the infrastructure through social and material interactions between people, tools, the space and the environment.

Through a case in practice, this paper provides a detailed analysis of participants' skill development in infrastructuring processes. The case of a 'co-sewing café' highlights that focusing on what participants can do prompts us to design beyond the roles of users and designers. The café is a 'research through design' experiment. It continued beyond its project time, self-managed by its participants. Focusing on what the participants can do in the co-sewing café (i.e. skilful acts of use) sheds light on the role of their skills in influencing a designed infrastructure and the potential impact on sustaining participation. A tentative analytical framework, building on the insights from the literature

supports the analysis of the case, exploring the following research questions. Why is a nuanced understanding of participants' skills important to address specific challenges in extended PD? How can different types of participants' skills be understood in relation to one another and within practice?

The co-sewing café is part of a larger doctoral project, established by me and supported by two colleagues. I designed and facilitated the co-sewing café as a type of makerspace, offering an open, collaborative workshop space framed by its participants and purpose (Kohtala and Bosque 2014). I consider the café a makerspace because it fosters and relies on participation over a longer time span, including the sharing of skills among its participants, as similarly identified in peer production spaces. What I call 'alternative spaces of peer production' are spaces that offer means to produce locally, such as 'Fab Labs', 'hackerspaces' and 'makerspaces' (Maxigas and Troxler 2014; Nascimento and Polvora 2013). They are driven by groups of passionate people, sharing production facilities and place individuals into dialogue to share expertise and produce artefacts through 'peer to peer' exchange (Seravalli 2014; Mota 2011). Such spaces advocate processes of designing and making together, and hence exemplify designer/participant collaboration. The explicit choice of a makerspace for textiles offers the advantage of clothes that are relatively simple to assemble and require little technical equipment, and thus offer a suitable context for exploring skilful participation that thrives in a space attuned to its participants. Nevertheless, the purpose of the café surpasses that of producing garments and moves towards learning and exchanging knowledge and skills to foster social interaction and community building amongst peers with common interests.

# 2. The understandings and challenges related to participants' skills in participatory design

Skills, and designing for skills and skilled work (in reference to computer artefacts), and mutual learning amongst designers and skilled workers have always been important for PD (Ehn 1988). In early PD, the participants were highly skilled workers with craftsman's abilities, professionals with 'instrumental work skills and social interaction competence' (454). Ehn (1988) further distinguished between the different types of tacit knowledge as a sensual experience. These are *knowledge by familiarity* and *formalised* or *automated tacit knowledge* (represented by the social competence of making judgements, for instance, learned through experience or the guidance of someone more skilled). These PD processes aimed to enable workers 'to use and enhance their skills while avoiding any unnecessary or negative constraints or automation of their work tasks' (Robertson and Simonsen 2012, 4). However, a detailed account of and descriptive terminology for the acquisition of different types of skills through PD processes and techniques are less explored.

In PD, skills are described as a key aspect of mutual learning, enabling a 'masterapprentice relation in a double sense,' in which designers gain insights from highly skilled users and vice versa (Ehn 1988, 377). Roles (designer vs user) are assigned by associating specific skills with them. However, in extended PD and infrastructuring, roles become more blurred (Hillgren, Seravalli, and Emilson 2011). This phenomenon is not unique to PD, and has also been acknowledged in related studies such as end-user development and human-computer-interaction (HCI) discourses (e.g. Fischer and Scharff 2000; Botero 2013; Kaptelinin and Bannon 2012). To shed light on the blurred spectrum of design and use in participatory and infrastructuring processes, I attempt to elucidate the nuanced differences in participants' skills in terms of participation.

I understand participation as skilful acts of use, following Redström's (2008) act-based perspective that emphasises 'what we do, not who we are.' This description does not stress roles; it allows a more in-depth view of participants' skills development and how different types of skills are interrelated with the way in which people participate. Skilful acts of use are thus not only enabled through the designers providing tools or methods for participants; they are also informed by highly skilled users.

Contemporary PD is extending the design process towards structures that allow participants to become driving actors, enhancing their skills in design and reflection (Smith and Iversen 2018). Infrastructuring contributes to this new perspective through emphasising the 'intangible outcomes of design, such as new skills, insights and a reflective stance towards technology' (14). For instance, Huybrechts et al. (2018) discussed 'capabilities development' and infrastructuring processes as enabling skills among users during participation. Hillgren, Seravalli, and Emilson (2011) explored infrastructuring in design for social innovation, addressing how to acknowledge the existing skills of very diverse participants in design-based infrastructuring approaches and beyond. Further, Leong and Robertson (2016) explored PD methods that reflect skills in regard to voicing values by involving ageing people in contemporary PD processes. Birk (2017, 777) elaborated on 'infrastructuring the social' in marginalised Danish communities, concluding that in this lies 'the potentials for subjective transformation – the acquisition of new skills, new knowledge, and new ways of being in the world.' Although these researchers recognise skills as important to PD, they do not offer a detailed analysis or description of the different types and their explicit impact on the spectrum of participation.

#### 3. Skills discussed in relation to alternative spaces of peer production

Fab labs, hackerspaces and makerspaces are spaces set up for and/or by people using tools, equipment and facilities to design and produce their artefacts (Kohtala 2016; Seravalli 2012). Participation in such spaces is often discussed as being directly related to the acquisition of practical skills. The acquisition of skills is seen as empowering participants/ makers with greater independence from market-dictated consumption patterns and allowing them to foster local community initiatives (Lindtner and Lin 2017; Seravalli 2014). As an example, longitudinal research on digital fabrication technologies, embedded as education in Danish schools, has shown that these fabrication technologies offer students the means to learn and practise skills in digital production (Smith and Iversen 2018).

Skills in communities of peer production are considered highly important for developing a 'maker identity' and participants' agency, which helps the participants feel connected to the respective community and thus contribute to its sustainment (Toombs, Bardzell, and Bardzell 2015). In other words, maintaining and sustaining such a community requires labour, skills, knowledge and sociality to care for others and the space (Toombs 2016). One major aspect of care is identified as sharing skills amongst the members. When members have special skills, they can develop an identity related to these skills but also care for others by transferring them (Toombs 2016).

#### 4. What constitutes skilful participation?

Participants' skills, which are elaborated below, have always been important to PD and the related communities, though interest in them has moved in different directions. Hence, there are many relevant theories related to skills in PD, ranging from Marxist epistemology to pedagogical learning theory, participatory action research and activity theory. In this paper, I refer to practice-related literature on PD and peer production to compile notions of skills in a tentative analytical framework. This helps us reflect upon and analyse participants' skills development in a rich case and illustrates the theory and practice exchange that lies behind the contribution of this paper.

Related to PD discourse, Ehn's notion of skills, which should be seen as within his larger framing oriented towards Marxist epistemology, acknowledges two kinds of knowledge production (Ehn 1988). He distinguishes between theoretical knowledge production, represented by insight and new understanding, and the acquisition of skill and competence (Ehn 1988). He further defines four categories or stages of knowledge, referring to Joachim Israel's work as a Marxist sociologist (88). The first stage is understanding, where one does not necessarily reflect upon the reason for knowing something, and moves on to awareness of understanding, comprising reflection on what was previously self-evident. Insight is articulated as the next stage, a stage that actively produces knowledge by approaching situations with a different view. Thereby, a new design can be created through a new understanding. This way of reflecting can be incorporated into new everyday practices and skills, resulting once more in understanding but also in 'the acquisition of new knowledge in the sense of competence or skill' (90). Mastering a skill through in-depth reflection and the ability to practise it well can enable new routines 'within the frame of social interaction' (91). According to Israel, quoted by Ehn (1988) this is called *creativity*.

In contemporary PD research, such detailed descriptions of the different types of skills and their acquisition are rarely found. Kolko et al. (2012) offered an interesting exception to exploring informal learning and technical skills development in their PD- and maker-/ hacker-inspired 'Hackademia' project. With their research, they aimed to address the lack of interplay between skills, emphasised through the predominant model of higher education being strictly discipline-oriented, claiming that 'this narrow sense of expertise is ultimately tied more to identity than aptitude' (129). They offer insight into learning in an environment similar to makerspaces and describe how learning occurs through discovery and exploration, motivating 'learners to develop self-directed, creative problem-solving skills' (131). Due to the project's similarities in approach, this paper adopts the same principles and definitions of learning and skill acquisition, building on the Learning Partnership Model (Baxter Magolda and King 2004). The identified principles include 'validating learners' capacity as knowledge constructors,' 'situating learning in learners' experience,' and the definition of learning as 'mutually constructing meaning' (Kolko et al. 2012, 131). Further, it is relevant to distinguish between 'individual competencies - the skills, mindsets and motivations of individuals' as 'soft' and 'hard' skills' (Morgan, Baser, and Morin 2010, 28). Soft skills are social skills, the ability to building interpersonal relationships, 'generating leadership, loyalty, and legitimacy'. Hard skills are manual skills: 'technical, financial and logistic' skills (28).

I interpret these notions from the literature and place them in relation to a tentative analytical framework in Figure 1 below. How skills are performed, but also constantly change, is identified as learning or developing skills by practising them over time. Ehn's (1988) four stages build an interrelated learning process and increase with learners' experience. The acquisition and practice of a skill is regarded as constructing new knowledge, whereas creativity is seen as the ability to embody a skill so deeply that one can develop new routines and practices for it, understood as a creative problem-solving skill. The different types of skills (manual, social, and creative problem-solving skills) that I consider relevant for the following analysis are identified and placed according to my understanding of them along a spectrum spanning four preliminary stages.

Contemporary PD extends in time and scope, and can involve infrastructuring processes, as exemplified in alternative spaces of peer production. In such instances, sustaining participation over time is a key criterion, but also a challenge. The challenge relates to the blurring of the roles of designer/participant, and the associated responsibilities, and thus requires deeply examining different types of (skilful) participation over time. The co-sewing café provides an excellent instance of investigation through practice, as it can be understood as a makerspace providing tools, space and a community of peers to share and practice skills. The café has sustained its participants over an exceptionally long timeframe (to date almost four years), changing its infrastructure through contextual iterations (i.e. project funding or available space) and types of participation, which I also refer to as instances of infrastructuring. To describe the skilful participation processes, the notions of skills identified above serve as analytical lenses in a tentative framework for interpreting and relating the categories derived from coding the participant interviews and the additional materials collected.



#### as situated in the learners' experience

**Figure 1.** This tentative analytical framework brings together concepts from PD and peer production literature and organises them along the processes of learning and practising different skills over time.

#### 5. Exploring skills in the co-sewing café

#### 5.1. The co-sewing café

Following a 'research through design' approach (e.g. Brandt et al. 2011), I designed the cosewing café on the basis of PD values, aiming to attract a diversity of participants, something underrepresented in traditional technology-driven hacker- and makerspaces (Fox, Ulgado, and Rosner 2015), addressing different age groups, female participants, and refugees. I set up, ran and developed the café myself as a trained designer, attending particularly to the practical, material and 'designerly' aspects. When I designed the cosewing café, I was fully aware of the values I was to embed in it, such as those of environmental sustainability; diversity in ethnicity, age and gender; and an emphasis on common ownership. These values were negotiated with the participants and external actors before and during the process, as were the changes in the context and wider structures (Hirscher and Mazé 2017).

The co-sewing café was established in a small town of about 6600 inhabitants in South Germany in July 2016. It was set up and funded for eighteen months as part of a larger research project, a '*Reallabor*' [real-world laboratory] that investigated sustainable transformation in a rural context (Geiger, Hirscher, and Müller 2017). It occupied a former sixty square metre shop front, hosting ten to twelve workstations, which included refurbished domestic sewing machines, and donated sewing materials and fabric, and a corner with free tea and coffee. The materials for analysis were collected during these eighteen months,<sup>1</sup> documenting forty-two workshops, each three hours long, with approximately 314 participants. In each workshop, the facilitators provided sewing suggestions (such as garment patterns and samples to try on) for different skill levels as well as support, advice and ideas.

I designed the café on the basis of the results of a co-design workshop with about 30 locals, and newly-arrived refugees. The textiles-focus was chosen due to the real-world laboratory context. My aim was hence to provide a space that brings skilful making, design and clothing production closer to the participants. In this first co-design work-shop, we ideated different themes, where 'upcycling' was identified as of great interest. Starting from here, I conceptualised and implemented the café's basic equipment and workshop design. I see the café as a makerspace that provides equipment, materials and information for collective 'making', thereby offering room for exchange.

Processes of infrastructuring took place, as the café was fluidly adapted and changed by me as the facilitating designer, but also by the participants and the context. The café's infrastructure includes machines, tools and materials, and encourages participants to start making a garment on their first visit, aiming to reduce barriers such as the lack of space, tools, skills, ideas, and materials. I planned and facilitated the workshops, setting achievable goals to ease the entry level and reduce the fear of mistakes or the experience of frustration. My way of facilitation and workshop preparation was later adopted by former participants. Further, I intended to enhance independent making and collaboration amongst the participants by designing grouped workstations, and created labels for tools, machines and materials (see Figure 2). I also observed the need for instructions and multilingual posters, which I added to increase independence from facilitators, enabling individual skills development.

#### Instructions for pattern cutting



Figure 2. Enhancing skill development and independent making through specific design adjustments.

#### 5.2. Documentation and analysis methods

I applied a multi-method research strategy and played it out as a 'triangulation' of methods (Gray and Malins 2004, 15). In the co-sewing café, I drew upon documentary methods resembling autoethnography, as developed in research through design. More specifically, I kept and analysed a 'reflective journal' on my designerly activities (Gray and Malins 2004, 57) and recorded notes throughout the setup and after the facilitation of each workshop. Further, I used qualitative inquiry as the primary methodology for collecting and analysing people's experiences of the space, its tools and its members. Participant lists, including dates, names and times of participation, documented the routines of the participants. Twenty-six short, semi-structured interviews were conducted with the participants after their first or second participation. Extensive photographic documentation comprising approximately 1200 photographs taken by me and other participants provided additional material.

The interviews with fifteen open-ended questions collected in-depth information on reasons for participation; the experience of the workshop in terms of learning, interactions, and outcomes; and general feedback on the co-sewing café. They were recorded, transcribed and coded following an open, thematic coding strategy (Flick 2014). In the coding process, the repeated quotations related to a specific code were only coded once per interview. I recognised and structured the resulting 57 codes into ten categories for analysis. These categories derived from the interviews, grouping codes to related themes. As an example, the interest in learning 'new sewing skills' was coded 19 times, often stated as the reason for participation or the personal value gained. The codes 'dare to start sewing by themselves' (9) and 'renew existing knowledge' (5) were also grouped in the general sewing-skill development category, which I associated, in reference to the tentative framework, with 'manual skills'. 'Learning upcycling' (15) and 'revaluing old garments' (10) were also stated as reasons for participation and general value with respect to the co-sewing café space. I considered these *advanced, specific skills* that require a certain level of

ideation and creativity, and hence referred to these, based on my practical experience, as 'creative problem solving/design skills'.

The majority of the participants were female and their ages ranged from 16 to 80, though most were between 30 and 60. Each workshop had a varying number of participants, ranging from four to twenty-five; however, the average range was six to eight participants. Typically, about half were regulars, and the others were first-timers or occasional participants. Prior experience of sewing varied from total beginners with little to no prior knowledge (12) to those who were very advanced (14), which is reflected in the interviewees.

### 6. Analysis and findings

The analysis of the interviews compared to the photographs and observations enables an in-depth account of the interactions with tools, the space and peers, with a special focus on acquisition, practice and the sharing of participants' skills. The analysis uses the preliminary framework compiled in Figure 1 to reflect upon the case materials.

#### 6.1. Intertwining interview findings with theory and practice

Comparing the interview analysis with my observations through practice revealed a strong interrelation of the different participant skills. The codes that arose most often regarding reasons for participation or the value gained through participation were 'learning new skills', and 'upcycling'. The social interaction category was also prominently mentioned: 'exchange with others,' 'meeting new people,' and opportunities for 'cultural and generational exchange'. In the following section, I elaborate on the interrelation of the different participant skills, which is illustrated in Figure 7. The elaborated participant skills are based on intertwining interview findings with terminology from the literature and my practical experience, documented in my dairy notes and photographs. For instance, general sewing skills are manual skills, which build the basis for learning advanced skills such as upcycling, to creatively reimagine what an unwanted garment could become. Of course, the strongly interwoven role of myself as a designer, facilitator but also a researcher creates a certain bias. However, I aimed to reduce this by triangulating interview materials with rich and detailed observations through notes and photographs. In the following section, I elucidate the analysis of the materials by describing my findings from practice concerning the terminology extracted from the literature.

#### 6.2. Participants' skills practised in the co-sewing café

The preliminary analytical framework established in Section 4 is used as a lens to interpret the interview results, diary notes and observations. This analysis aims to understand how participants' skills are practised and developed in such contexts, and how this informs participation. In addition to the notions identified in the literature (manual, social and problem-solving skills), *facilitation* and *upcycling* are added as design skills, building on the categories derived from practice.

#### 6.2.1. Manual skills (basics in sewing)

One of the main reasons for participation and a personal benefit gained was learning manual sewing and garment construction skills. Each workshop offered different themes (i.e. types of clothing to be made) at varying skill levels. The support of the facilitators, depending on the individual skill level, enabled a step-by-step process of learning clothes making. This allowed the participants (regardless of their prior knowl-edge) to gain new manual skills. One participant said: 'I like sewing very much and, on the other hand, the co-sewing café offers the opportunity to extend my hobby, to learn new skills. I don't sew clothes; I do patchwork and felt, here I have the opportunity to learn clothes making.'

Experienced participants often added personalised details to their garments or increased the level of difficulty by adjusting the paper pattern provided, constructing new knowledge and routines. Further, instructions and patterns were often copied so that the process could be repeated at home, enhancing learning new skills through repetition.

#### 6.2.2. Social skills (sharing skills as care)

The development of 'soft skills,' (i.e. social skills) I understand as building relationships by sharing skills during workshops (also identified as care). Care is highly important for sustaining a community of participants, as identified by Toombs (2016), elaborated above. This was prominent in the co-sewing café, occurring across every level and type of participant. Participants helped each other almost naturally because half of the them had prior sewing experience. They thus mostly worked in groups of two to three people. The experienced participants advised the beginners on, for example, cutting, threading the machines, or sewing techniques (Figure 3). When mistakes occurred, shared creativity was gathered for innovative problem-solving, including helping to unstitch,<sup>2</sup> illustrating care for others. One participant noted the following: 'When everyone is working creatively, people just help and support each other.'

Another example is a former seamstress who occasionally participated by advising others (Figure 4), thereby developing social and facilitation skills. Her manual skills put her in the position of taking responsibility for others, sharing her skills, and helping others develop their skills. This illustrates the interrelation of social and manual skills. The space for and ability to share skills and knowledge seems a very important aspect of social skills development and sharing a common interest in a feeling of community. One interviewee said: 'I think it [the co-sewing café] is a meeting place. Old and young and everyone is in contact. Everybody can bring their abilities.'

#### 6.2.3. Facilitation skills (hosting workshops)

The acquisition and practice of social and facilitation skills are, in the context of the cosewing café, strongly intertwined, often building on already acquired manual sewing skills. Developing facilitation skills was reflected in the participants' abilities to adapt and develop the organisation and running of their workshops, including the transfer of their skills to other participants. This was documented through the increased number of independently facilitated workshops over time. When participants were manually skilled, they started to practice social skills during the workshops and gained confidence in their facilitation skills. This became evident when they started to develop their facilitation tools



Figure 3. Practising social skills: beginners and advanced participants sharing manual skills.



Figure 4. Skill sharing as caring across different generations and nationalities.

and methods, as illustrated by one former participant offering a 'how to sew in a zipper' workshop (Figure 5), for which she prepared half-ready samples to ease the participants' learning experience.



Figure 5. Manually skilled participants developing their own tools to facilitate independent workshops.

# 6.2.4. Creative problem-solving (design as upcycling skills)

I refer to creative problem-solving as design skills, which in this context is understood as upcycling. Upcycling garments requires certain manual skills, but also creativity to ideate a new vision into an existing one. This can be demonstrated with the example of Naser, a young Afghan refugee who used to work as a dressmaker. Of course, he already had great manual sewing skills, which enabled him to gain and practise facilitation skills. In addition to these skills, he was able to develop his creative problem-solving (i.e. design skills). After participating once, he offered to facilitate a workshop on upcycling, without prior knowledge of the concept. We provided him with four old men's shirts for preparation and discussed the basics of upcycling with him. Within a week, he presented three upcycled garments that he ideated and skilfully sewed (Figure 6). Illustrating the interrelation of building on existing manual skills opens the door to learning design or facilitation skills.



Figure 6. Upcycling, practised by Naser; acquiring creativity as a design skill.

Other participants, with yet less skills, could use the samples he prepared to gain inspiration to also creatively reinterpret garments. One interviewee stated, 'Making something from materials that you would otherwise throw away, or that perhaps wouldn't otherwise be used, to create something new, something new, that is really like being a designer.'

Specifying design skills as learning to creatively redesign unwanted garments (upcycling) highlights important nuances and acknowledges the participants' skills diversity. The resulting skilful participation can be highly diverse, and potentially include planning and hosting co-sewing sessions.

#### 7. Discussion

The contemporary developments and challenges in PD require revisiting participants' skills development through participatory and infrastructuring processes. This paper explored skills in extended PD while identifying the scarcity of research on the detailed notions of skills in participation. Certain notions of skills were found in the literature (i.e. manual skills, social skills, creative problem-solving) and compiled into a tentative analytic framework. This provided lenses to analyse a case rich in practice (i.e. the co-sewing café), and elucidated specific nuances relevant for participation in this specific context.

Notions such as *facilitation skills* and *upcycling as a design skill* were acknowledged as important for running and maintaining participation in the case of a co-sewing café over time. The identified participant skills need to be understood as being interlinked through a process of constant learning over time. They are partly built upon each other, as illustrated in Figure 7, which adds two specific skills notions that were identified in practice. For instance, manual sewing skills are a prerequisite to acting as a facilitator or to practising upcycling. Social and facilitation skills are closely related, as facilitation is built upon manual and social skills such as a feeling of care for one's peers and space and



**Figure 7.** Adding facilitation and design (upcycling) skills to the tentative analytical framework to illustrate the diversity and specific types of skills identified through practice.

its activities. These interrelations were identified through in-depth accounts of the practice and aim to illustrate the diversity in reasoning for participation.

The co-sewing café attracted a wide variety of participants, some more skilled than the facilitating designer, some who enjoyed social interaction more than the actual sewing, and some who were using a sewing machine for the first time. Identifying nuances in the participants' skills elucidates this diversity and underlines the relation between participation as skilful acts of use, thriving in a space that can adapt fluidly to these. The tentative analytical framework provides a starting point for analysing extended PD cases with a focus on skilful participation. The analysis suggests that there is an important relation between participants' existing and learned skills and their participation.

The co-sewing café was designed as a fluidly adaptable infrastructure enabling participants to perform, share and acquire skills, and to be flexible and open towards changes occurring over time. These changes were often informed by participants who either had or lacked skills. For instance, improved manual skills encourage independent making, which can, if desired by the participant, develop into facilitation skills. I tried to enhance this development by designing a flexible space and providing labels with instructions for more independent working (e.g. labelling types of materials, tools or pattern assembly) and the use of machines. These infrastructural changes supported independent making and people helping each other (i.e. social skills) or daring to facilitate their own workshops. These designerly interventions with the co-sewing café are also considered infrastructuring. Likewise, participation is enabled through acquiring or practising slightly different skills, infrastructuring the café. Understanding the co-sewing café as a space for infrastructuring enabled the participants to nourish their interests and skills, allowing for changes to the infrastructure to address their interests beyond the project time. Similarly, Dantec and DiSalvo (2013) described infrastructuring as providing participants with the framing and capacities to address shared issues in the future.

The paper proposed that a nuanced understanding of participants' skills is important to elucidate the relation of skills and participation and how participants actively engage with space and activities. This can contribute to a better understanding of the reasons for sustaining participation in such contexts. The diversity in participants' skills was illustrated by the analysis of the co-sewing café, using a tentative analytical framework, which can be developed further with deeper theoretical grounding and can be tested in other related contexts. The findings gained through practice open up the potential for further research on the important role of skills in participatory and infrastructuring processes. The opportunity for skills development at every level can be interpreted as potentially nourishing sustained participation due to the openness of who is (or can be) doing what. Skilful participation enables sharing of responsibilities and tasks such as workshop facilitation beyond the person initiating the activities (e.g. a design researcher) and thus changes the space and its way of working.

Therefore, this paper emphasises the important role of skills in such contexts and does not define participants by identities (gender, age, occupation, nationality) or roles (designer, user) but by the types of knowledge they have and their skills. Thereby, the challenges of future self-organisation beyond providing designed tools can to a certain degree be addressed and enable participants to continue independently.

# 8. Conclusion

Exploring and establishing the notions of participants' skills elucidated the role of skills in relation to participation and extended PD challenges. The paper contributes to PD research and beyond by differentiating participant skills and their interrelation by analysing and adding to them through practice. The tentative analytical framework (i.e. Figure 7) provided a lens for analysing a rich case and discussing participant skills in terms of participation in long-term PD projects. This preliminary framework can be made more robust through additional theoretical development by consulting, for instance, learning and activity theory, which I propose as a subject for future research.

### Notes

- 1. The co-sewing café continues its activities today, more than two years beyond the funded project-period. It has moved to a new space (the local school building), supported by the city administration and is run by several participants who voluntarily took over my role as facilitator and organiser.
- 2. Unstitching a wrongly made seam experienced and expressed by the participants as a timeconsuming and frustrating process.

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