40.1 Creating Spaces for Collaboration in Community Co-design

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Abstract

Urgent societal challenges have led to unease in our socio-cultural interactions and the production systems that underpin our lives. To confront such challenges, collaboration stands out as an essential approach in accomplishing joint goals and producing new knowledge. It calls for interdisciplinary methodologies such as co-design, an approach capable of bridging multiple expertise. The core activities of co-design are based on the premise of collaboration and on developing creative social environments. Yet achieving collaboration through co-design is challenging as people need to understand each other, and develop trust and rapport. We argue that 'informal-mutual learning' is central to building mutual understanding. This article explores how we create spaces for collaboration through co-design by examining the social environments supporting them. It examines the value of collaboration and its impact upon participants within an action research project conducted in Scotland. We identified Cultural-Historical Activity Theory (CHAT) as a suitable theoretical framework. It offers support for holistic inquiry into participation and learning. Its strength was in the attention that it pays to multi-dimensional human interactions within the social environment. This led to an understanding of the concepts of boundary-crossing and boundary space examined through a CHAT lens. The findings shed light on four designerly conditions supporting informal-mutual learning when engaged in collaboration during co-design situations: choreography and orchestration, aesthetics, playfulness, and quality and quantity of participation. The findings enable us to elaborate on the theorisation of boundary space, a theoretical space for the assemblage of multiple levels of expertise to achieve collaboration.

Keywords

collaboration, co-design, participatory design, boundary-crossing, boundary space, Cultural-Historical Activity Theory

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Introduction

Urgent societal challenges have led to a sense of unease in our socio-cultural interactions and production systems that underpin our lives – as has happened during the pandemic. To confront such challenges, collaboration stands out as an essential approach in accomplishing joint goals and producing new knowledge. In this study, collaboration is considered to be an interdisciplinary, interpersonal and effective synergy, seeking to accomplish partially shared goals of motivated individuals, which otherwise, could not be attained if individuals act or work alone (Bronstein 2003). The mutual relationship between collaborators builds upon the dilution of roles, horizontal relationships, and the development of consensus regarding the flow of rules and social order holding the group together. This calls for an emphasis on interdisciplinary methodologies such as co-design, an approach capable of bridging multiple expertise. The core activities of co-design are based on the premise of collaboration and the development of creative social environments, where the increasing demands on participation (Smith et al. 2017; Jenkins 2006) can be channelled (Calvo & Sclater 2020). Yet achieving collaboration in co-design is not easy as people need to understand each other, and develop rapport and trust. This article explores how we create spaces for collaboration in co-design by examining the social environments supporting them. It examines the value of collaboration and its impact upon participants within an action research project conducted in the Highlands and Islands of Scotland. The project, called 'Tackling Loneliness and Isolation', formed part of a larger research project called 'Leapfrog' (Calvo 2019; Whitham et al. 2019; Broadley & Smith 2018; Mcara et al. 2018). The Leapfrog Project (see httpp:// leapfrog.tools) deployed co-design to 'transform public sector engagement through design'. The overall project objective was to explore how to strengthen dialogues with communities, the third sector and the public sector and support effective engagement. The purpose of the action research project was to research this objective with practitioners and public service providers dedicated to tackling loneliness and isolation, particularly in late life stages and in rural areas. The project proceeded through a rigorous ethical process, approved by the Glasgow School of Art (GSA) Research Ethics Committee (Hay 2016), and the Leapfrog Project ethical approval procedures.

In addition to collaboration, multi-actor expertise (divergence) is also another requirement in co-design, which focuses on efficient design outcomes that are capable of responding to multiple needs and personal-social situations. This raises a related challenge in developing understanding among disciplines, where Ehn (2017) suggests the creation of a common language, including Zahedi (2011), with both emphasising informal-mutual learning as a key synergy. The issue of developing mutual understanding and the co-creation of a hybrid language can be addressed by supporting informal-mutual learning in co-design, particularly 'when the project group is focused on creating common understanding of problems and needs… and working to develop visions of overall change' (Bødker et al. 2004, 64). Informal-mutual learning, thus, is central to the process of co-design. Aiming to envision designerly strategies to support the emergence of informal-mutual learning, we next review the basis of some social theories of learning.

Situated learning and communities of practice (CoP)

For Lave & Wenger (1991), learning is always situated in a socio-cultural context. This includes the physical environment, human activities and the people involved, knowledge contributing to performance, knowledge embedded in activities and also the social interactions prompting those activities. Later, Wenger (1998) defines learning essentially as a social phenomenon. Thus, learning is unintentional and occurs as a complex (cognitive) function during interactions with our surroundings, hence, through participation. As Wenger argues, 'Participation is always based on situated negotiation and renegotiation of meaning in the world' (Lave & Wenger 1991, 51), implying that theory and practice are indivisible. Participation breaks down traditional divisions between abstraction and experience because the material ecologies of social situations, the people involved (participants) and their agencies entwine in the production of thought, communication and learning (Eraut 2000). Participants, in this study, included all the people involved in designerly situations and engagements (design-researchers, practitioners, non-design-trained and laypeople), thus aiming to legitimise full and peripheral participation. Wenger (1998) indicates that learning through participation assists in assembling what we do, who we are becoming and how we reinterpret the activities we undertake. This occurs in four dimensions: (i) meaning: changes in our understanding through experience; (ii) practice: compilation of cultural-historical background that gives rise to the body of knowledge, which continuously evolves by doing; (iii) community: the social structure determining the values and beliefs, performance, competence and skills of the members; and (iv) identity: changes in the perception of oneself within the community of practice implying a re-construction of autobiographical/personal narrative.

Wenger *et al*. discern three levels of learning through participation: personal learning (related to personal knowledge); community learning, which 'entails a process of alignment and realignment between competence and personal experience, which can go both ways' (Wenger et al. 2015, 14); and 'landscapes of practice', a notion introduced to illuminate the highly complex layers shaping different practices, related through boundaries. They explain how one belongs to many communities of practice, adopting different positions (peripheral–full participation), being influenced by all of them, and vice versa. 'Competence' is 'the dimension of knowing negotiated and defined within a single community of practice', '"knowledgeability" manifests in a person's relations to a multiplicity of practices across the landscape' (Wenger et al. 2015, 13). Therefore, competence is part of the specific 'codified knowledge' (Eraut 2000) of a community of practice, being influenced by its members/practitioners. 'Knowledgeability', on the other hand, recognises that one can be competent in a specific practice and, at the same time, knowledgeable in some landscapes of practice.

Mutual learning in co-design

Originally, mutual learning in co-design was understood as an emergent learning, 'hands-on, project-based learning in real-world situations' (Sanders 2017, 213). The meaning of mutual learning comes close to Freire's (1970) pedagogical approach of human emancipation. Over time, this political principle was undermined as designers concentrated on consumer products. Then mutual learning was understood as the process of designers acquiring a better understanding of the participants' contexts and, simultaneously, the non-design-trained participants acquiring knowledge

about possible future design solutions (Karasti 2001; Bjerknes & Bratteteig 1989). However, this concept manifests a traditional view of learning based on knowledge-acquisition, where it still resonates at certain levels of hierarchical relationships like teacher–student. These views of learning oppose the concept of learning adopted in this research influenced by social theories of learning. Here Freire's (2004) emancipatory aspirations need to come to the fore.

Informal learning

The era of participation (Smith et al. 2017) is fuelled by the 'knowledge economy'. Intellectual competencies such as creativity are now sought by organisations (Bason 2010). Intangible assets and higher levels of knowledge are also required. This leads to an expansion of adult education and to a questioning of intellectual property (Drahos & Braithwaite 2002). This also leads to the promotion of higher formal education (Molla & Gale 2014). Educational science outlines three learning subsystems: formal, non-formal and informal. As Mündel & Schugurensky (2008) explain, formal learning is highly institutionalised and related to schooling curriculum-based activities; non-formal learning is associated with workshops and activities with some sort of intended and recognised learning outcomes; informal learning encompasses the rest of human agency, drawing on a wide and undervalued spectrum of learning situations.

Schugurensky (2000), on the twin dimensions of intentionality and consciousness, distinguishes three types of informal learning: (i) self-directed learning (intentional and conscious), (ii) incidental learning (unintentional but conscious) and (iii) learning through socialisation, which generally is unintended and unconscious. Singh (2015) contends that only formal learning is validated and recognised by educational frameworks. However, informal learning represents between 80 and 90 per cent of people's life-learning processes, and is considered effective because people can choose what they want to learn, from whom and when (Cross 2011), augmenting their capabilities. It usually occurs in community engagement settings with non-hierarchical relationships (Mündel & Schugurensky 2008; Freire 1970; Dewey 1916), which nurture a collective power capable of solving the actual issues of communities because such engagement can lead to initiatives within that social context. It advocates another way of learning, drawing strength from the construction of knowledge (Freire 2004), both personal and social (Eraut 2000). The situatedness condition of learning adds value to human resources and hidden talents (latencies) that emerge from learning through socialisation (Gibbs & Angelides 2004) or rather, participation in society. Creativity arises from participation and through lived experience (Hallam & Ingold 2007), where informal learning scenarios afford many opportunities where people can choose in what ways they want to learn (Calvo et al. 2016).

Theoretical framework: Cultural-Historical Activity Theory (CHAT)

CHAT is a multidisciplinary framework that focuses on the study of human agency from individual and social perspectives. Extensively used in psychological, educational and ethnographic studies (Engeström 1987, 1993, 1999), it has somehow remained largely unexplored and undervalued in design research. This research identified some studies using CHAT in human–computer interaction (Gay &

Hembrooke 2004; Nardi 1996b; Kuutti 1996, 2009; Karasti 2001; Sam 2012), interaction design (Kaptelinin & Nardi 2006), service design (Sangiorgi 2009; Menichinelli 2015) and a few studies in collaborative design (see Zahedi et al. 2017) exploring the value of CHAT as the lens to explain design situations.

Zahedi et al. (2017) identify two applications of CHAT in design: (i) as a tool to uncover disturbances in design processes, usually applied at early stages assisting in the co-articulation of issues; and (ii) as an analytical framework to study human synergies in collaborative design. Creating a visual analysis tool, using the CHAT triangular model (see Figure 1) as a mapping tool, attached to a timeline with periodic intervals, they visualise group dynamics. Gay & Hembrooke (2004, 12) illustrate 'an iterative design cycle' informed by CHAT, a spiral diagram which finds inspiration in PAR. The cycle proceeds through six stages: (i) study current activities; (ii) identifying disturbances; (iii) developing new solutions; (iv) testing and evaluation; (v) re-conceptualisation of designs and (vi) re-identifying disturbances, – similar to Light & Boys' (2017) approach.

CHAT was identified as the suitable theoretical framework for this study. It provides a holistic approach to understanding human–human interactions including the socio-material ecologies supporting social environments of co-design, and it assisted in eliciting unintentional and unconscious learning processes. Most theories isolate the components – people and community, culture and history, tools and activities (Gay & Hembrooke 2004; Kaptelinin & Nardi 2006; Kuutti 1996; Nardi 1996a; Roth & Lee 2007; Sam 2012) – or simplify socio-material situations into a system of knots and networks, displacing emotions and motivations in the enactment of agency. Its strength comes from the attention that CHAT pays to 'multiple dimensions of human engagement with the world and in the framework that it provides for configuring those dimensions and processes into a coherent "activity"' (Gay & Hembrooke 2004, 4). CHAT as the overarching research framework provides a strong theoretical structure to begin visualising the mutual accommodations and to incorporate those key dimensions configuring co-design situations: personal and social, tools and design activities, rules and social conventions, roles and distribution of power (Gay & Hembrooke 2004). Our intention was to integrate socio-emotional aspects influencing the co-design situations and participant learning.

Boundary crossing

The concept of boundary-crossing, developed in the 1990s, reflects the transition of individuals interacting between various practices (Suchman 1994). Also considered in situated theories of learning (Lave & Wenger 1991) and in CoP, it was particularly advanced in educational sciences and psychology. CHAT considers it a 'category of the cognitive process' (Engeström et al. 1995, 321), in which an individual enters unknown spaces of practice and needs to overcome the challenge of renegotiating social and relational positions vis-à-vis the other individuals who also cross the boundary (Akkerman & Bakker 2011). It is formed on the principle that every learning process entails boundaries, which establishes differences in expertise (Engeström 1987) or differences between peripheral and central members within a community of practice (Wenger 1998). Thus, boundary-crossing takes place when moving and establishing relations across different disciplines or sites (Suchman 1994).

A boundary is defined as the imaginary contour dividing (different) sociocultural stances, leading to different ways of doing and thinking in human agency. It is

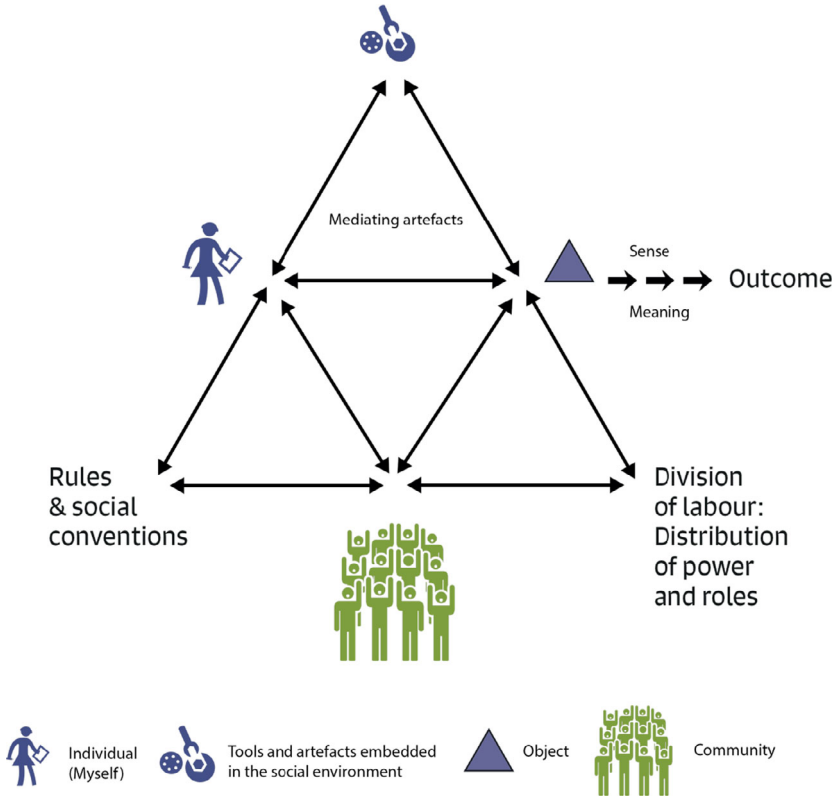

Figure 1
CHAT triangular model, (minimum activity system).Reinterpretation from Engeström's model (1987, 78)

seen 'as a dialogical phenomenon' (Akkerman & Bakker 2011, 132). Also, boundaries relate to other boundaries which are relevant to them by establishing connections and interdependences. Roth & Lee (2007) relate the notion of 'boundary' to the discovery of (personal or interpersonal) contradictions by observing different activity systems. Contradictions between activity systems are perceived as situations that can promote change and development.

Engeström et al. (1995, 319) state that people engaged in 'boundary-crossing' need to 'face the challenge of negotiating and combining ingredients from different contexts to achieve hybrid situations'. In this process, each individual also needs to learn from the others' expertise and come up with his or her own 'recipe' through the combination of these 'new ingredients', which entails a learning process (Akkerman & Bakker 2011). Boundaries delimit different practices and accumulate knowledge. Thus, there is great potential for learning to be supported at the boundaries – an essential dimension for communities to keep evolving in a dynamic interaction with one another (Wenger et al. 2015).

Boundary space

'Boundary space' is a notion introduced by Gutiérrez et al. (1995), along with the term 'third space', used to describe certain situations in classroom activities where

the roles (referred to by Gutiérrez et al. (1995) as 'script' or 'counter script') and perspectives of the teacher and the students interact to co-construct new meanings that expand the boundaries of both. As Gutiérrez (2008) states, the third space emerges from differences in engagement and participation (Calvo 2019; Lally & Sclater 2013). It also emerges from multiple social scenarios that informal situations provide, which are based on egalitarian structures of power-relations and therefore, the conversation flows from inclusive and *comfortable* social conventions.

Action research project and methods

'Tackling Loneliness and Isolation' consisted of a nine-month co-design project with several social enterprises and public service providers operating in the Inverness and Moray area (Figure 2): Badenoch & Strathspey Community Transport Company (BSCTC), Health and Social Care Moray, Family Outreach, Art Therapy, Let's Eat Forres, Unit Credit, TSI Moray and so on. The research area and the engaging communities focused on supporting or/and providing services to the rural settlements, where in the last decades the symptoms of loneliness and isolation have been growing and dramatically accentuated during the pandemic. In the UK there are 1.2 million chronically lonely people (Age UK 2018), which impacts directly on the health and wellbeing of individuals and communities (De Koning et al. 2017). In this regard, the Scottish Government (2015) has been developing strategies to tackle these issues by providing services to support social networks/friendships, and community cohesion.

The aim of the project focused on developing tools which could enable the participants and their communities to share assets, resources and best practice – tacit knowledge developed over years of experience. We devised and facilitated a series of co-design situations and ethnographic encounters as a creative platform to share experience and knowledge born of practice. Over the project, we also observed how the spontaneity and improvisation of everyday life affected and modified the course of events and co-design situations. The methodology adopted a participatory action research (PAR) approach informed by visual design ethnographic methods, and reflective practice (see Calvo 2019; Calvo & Sclater 2020), which proceeded through four steps: (i) preparation for co-design; (ii) co-design situations; (ii) follow-up and (iv) analysis.

Preparation for co-design

During this step, the research team focused on building trusting relationships with communities. We dealt with the recruitment of participants and the elaboration of a common project agenda that included the interests and objectives of all the stakeholders. We conducted ethnographic encounters applying participant-observation methods, semi-structured interviews, and scoping sessions with key participants who assisted us in building a research network.

Co-design situations

This step was structured in two co-design workshops and one tool delivery event. All these engagements were held in two different settings to acclimatise the research team to the rural areas and vice versa, to accommodate the personal circumstances of participants and ease their attendance/participation. The day after

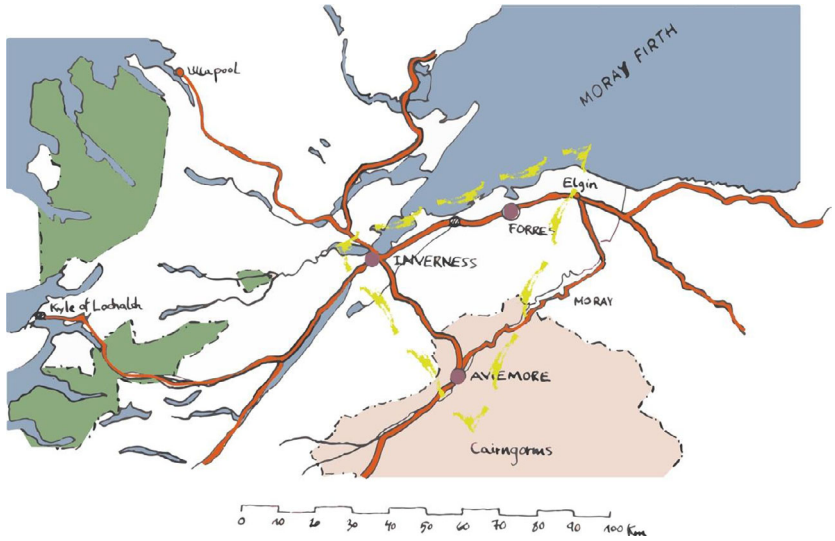

Figure 2
The geographical scope of the action research project, 2017

each event we conducted reflective sessions with some of the participants to raise awareness of their learning processes and capture enriched accounts of their experience. We also conducted semi-structured interviews.

Co-design workshop 1

The first co-design workshop was hosted on a community centre in Inverness, and it was orchestrated through three activities: (i) sharing current practice and building common understanding encouraging informal-mutual learning; (ii) crystallising insights and construction of shared meanings; and (iii) idea-generation. One participant attended thus it was important to obtain an in-depth perspective from them. The conversation soon grew fluent and friendly. The sharing of personal stories enabled informal-mutual learning by a simultaneous process of listening and empathising.

The next activities focused on visualising the participant network and co-designing ideas based on previous insights. We recognised best practice: taking care of volunteers, freedom of choice, cohesion and dialogue. Personal narratives enabled the research team to develop some understanding of the context of this project. At the end, it was agreed that informal-mutual learning emerged with more intensity at the beginning. Participant five also said that the exchange of personal stories enabled her to learn from the research team and establish certain levels of trust, and respect with us. Yet the activity of generating ideas was less creative. Such activity was less fruitful because there were not enough contributions and perspectives that informed the learning and creative processes.

Collective reflective session

This session was held at the Creative Campus, a facility that the Glasgow School of Art has in Forres, which enabled the research team to host the following engagements in a physical space well equipped to support collaborative and

creative encounters. Three participants came from diverse social providers operating locally. We conducted a recap on the progress of the project followed by a talk about their practices, emphasising their needs and barriers, and we eventually came up with the idea of co-designing a set of cards that would help them engage with the lonely, and inspire them in building conversation.

Co-design workshop 2

The second workshop took up the thread of the pack of cards, a conversational tool for tackling loneliness and isolation, and focused on materialising it with a diverse group of people. Twelve participants came from different organisations and had diverse roles.

The workshop started with a 'get-to-know-each-other' icebreaker, followed by an individual and reflective activity where the participants were invited to write their five top pieces of advice, drawn from their experience. We used those cards in the next collective activity, an adaptation of a poker game (Figure 3). Each participant shared her or his piece of advice once the participant's number was picked randomly. People asked questions about the advice shared because they wanted to know and understand each participant's context. They also added layers of knowledge and reflections on each participant's story. During this process, they co-negotiated and established the social conventions that would set the tone of the dialogue. They found their common language and agreed on the terms. All these processes pass, unnoticed and unconscious, in human interaction (Garfinkel & Sacks 2005). The group dynamic (social order) emerged from the way participants conducted themselves as a collective, and the sense of the context from their interactions. At some point, participants began clustering the insights. We shared intimate moments where some people became quite emotional. It was no longer about getting to know each other as trust and common understanding were already emerging. The boundary space seemed to settle during this process, once the human interactions were negotiated. Participants agreed on the following themes: listening, activities, mobility, support (physical and emotional), self-awareness and networks.

In the next activity, participants were divided into groups of four. The activity consisted of trying different games with an analytical mind-set and unpacking the principles and structure of each game to inspire the next activity: idea-generation (Figure 4). After comparing the three games, participants moved on to thinking organically, shifting into co-design. This followed a 'low-tech prototyping' activity (Muller & Druin 2012, 1142) in which each group of participants developed a concept-idea of a card-based game to engage with those lonely or/and isolated.

Collective reflective session

Participants reflected back and agreed there was a good group dynamic. They mentioned that the enthusiasm of the researchers passed on to the participants. In terms of their impressions, they seemed aware of what went on during the workshop, as they commented on the conditions that would enable informal-mutual learning, and hence collaboration, to happen. Participant two said:

> *The way you devised the games and the sequence of those games allowed somebody like him to also bring his valuable contribution, which, you know, another way he might not have done it if involved just chat, chat, chat, chatting. He might*

Figure 3
Co-design workshop 2, Activity 2 – The Poker Game, Forres, 2017

Figure 4
Co-design workshop 2, Activity 3 – Learning from card games, Forres, 2017

not be able to engage without that at all, but through the thing of writing down the things in the cards and then share it, you know, that was fun. It was just fun.

This resonated as a key aspect in supporting learning, in conjunction with playfulness. This participant observed how one of the quietest (shy) participants (they knew each other before the workshop) felt comfortable with the atmosphere created by the co-design situations, and found a way to contribute to the workshop

as a result of the orchestrated, choreographic designerly activities. The participants needed to understand from the beginning that the co-design situation was designed to be friendly, and open-minded, thereby creating an atmosphere for experimentation with everything open to imagination. This subtle message to the participants helped create an inclusive and comfortable boundary space. Participant one commented: 'I sat eyes closed, a bit of silence, and I felt that was openness in the room. I was surprised at how open and how quickly there was a connection. So that is the connection of all the people.'

Semi-structured interviews

The interviews drew attention to the social environment as a source influencing the development of the co-design practice alongside learning. Participant three said: 'I think that sense of connection was very important. To feel I was part of the group … and my input was important'. Participant eight said: 'I thought that game (activity 2, co-design workshop 2) was really good: making the physical space, so this diagrammatical, visual representation of people's contribution, and the element of getting agreement. It matched people's thinking. Without the game, we'd just be talking.'

Tool delivery event

Five participants participated in last event. There was a brief presentation recalling the steps of the process and then a consultation session to report their feedback and impressions. Participant one said her learning was based on other people's sharing and the whole co-design process, watching how people interacted. Some participants admitted to initial scepticism about the collaboration and doubts about the cards' usefulness, but they changed their perceptions in positive ways.

Follow-up

During the follow-up phase, we conducted reflective interviews with three participants in their natural settings four months after the project finished. During the interview we employed 'critical event recall' (Lally 2002), a technique used in education to uncover the symbolically constructed realities attached to past situations, revisiting memories and unfolding emerging patterns while describing participant perspectives (Kain 2004). According to Smith (2013, 130), it fits well with CHAT 'as it provides an understanding of the activity from the perspective of those involved in the activity'. This technique is usually conducted with fragments of video recorded during fieldwork, but in this study, we used 'reflective drawings' (Calvo 2019; 2017) made by the research team as prompts for interviewees to recall their experiences and to invite them to reflect on their learning processes, using the drawings to spark the interviewees' dialogic imagination (Bakhtin 1981).

The interviews gathered insights into the nature of informal-mutual learning in co-design situations. Participant two said the reflective drawings conveyed a visual representation of what she experienced. She added: 'I would like to try to develop ways to engage my groups, making the initial contact and introductions much more interactive.' She noted the value of the co-design situation, which created a boundary space, a third space, a social environment that made possible to re-organise the social order binding the participants together in a friendly and inclusive, safe 'realm of collaboration' (Lee 2008). In this regard, Participant eight said: 'It reinforces the emphasis on people and connections and collaboration. Collaboration is

one of those words that, it is easy to use, it is not so easy to demonstrate, and it is in fact quite hard to picture.'

Findings and discussion

The data was analysed by a three-step process of affinity diagramming. Both interactive and conceptual, the analysis required intuitive inquiry supported by deep reflection and dialogic imagination. Dialogic imagination emphasises the indivisible relationship between thinking and doing, where the physical dimension plays a key role. According to Harboe & Huang (2015), the tangible and physical manipulation of sticky notes over a surface animates kinaesthetic, visual and verbal channels to embrace the data as one panoramic overview.

We firstly abstracted insights, quotes and visual materials. Then we labelled them using sticky notes on a wall. We clustered them by affinity and identified emergent overarching themes using another clean wall. This step was repeated to allow the data to speak for itself and avoid bias or misinterpretations. The analysis draws attention to four conditions and the elements where designers could intervene to improve the co-design process, with a focus on supporting learning instead of paying attention to the resulting design products.

Choreography and orchestration

As the analysis revealed, the sequence of activities, the support tools and their distribution and (theatrical) performance over the physical space set the conditions for informal-mutual learning and collective creativity to thrive. Choreography and orchestration have the means to amplify informal-mutual learning, as evidenced in participant two's quote during the collective reflective session, and in participant eight's semi-structured interview. During the tool delivery event, the participants agreed that the venue was inspiring and helped them bring forward collective creativity, relating the choreography and orchestration with the spatial/physical qualities of the space.

Design-researchers and practitioners can intervene in the social environment by shaping the atmosphere to support co-design. Here, orchestration is understood as the planning and coordination of socio-material conditions aimed at supporting co-design situations. It also implies finding the balance between controlling and letting go within the group dynamic, keeping positive synergies between everyone and establishing power-balanced relationships to ensure a safe, friendly and inclusive space (a boundary space). According to Buur & Larsen (2010), the facilitator is not neutral, but acts within the self-organised cycles of participation and needs to be perceived as an equal participant who brings another perspective (Shaw 2002). This role requires the researcher to have certain socio-emotional skills, which allow for reading the evolving social situation on two levels – the emotional group state and the nuances of individuals. Such reading of the situation allows for improvising and adjusting planned activities, following the natural course of the collective.

Aesthetics

The aesthetics of the designerly activities amplified participant experience and activated their sensory symbolic constructs, which supported their interpretation of themselves within the co-design workshops. Aesthetics can communicate from, to and about emotions and relate to a wide number of material ecologies that define

co-existence in time and space, and influenced participant learning within the context of the case study described. This includes the physical realm, designerly activities, tools and techniques but also sounds and lighting, and inside–outside connections, woven into aesthetic language, setting up a safe and comfortable atmosphere. In this study, the aesthetics played a key role in setting the social environment by exposure to all the stimuli that reached us through the senses over the co-design workshops. For example, we prepared the physical space and its use; we embellished it with casino mats and chips. Everything was decorated with touches of a casino scenario (see Figures 3 and 4). We used the physical space to help us in facilitating the different activities to guide participants towards co-design.

Playfulness activated participation

The game broke the traditional conversational dynamics by bringing in the element of playfulness. Where usually the stronger voices monopolise the content of the conversation and use personal stories to persuade the others to align with their thinking, playfulness reshapes the terms of the conversation. Considered a key factor in supporting high-quality experiences of learning as well as being capable of creating inclusiveness, playfulness took away all the social aspects embedded in our identities – to some extent, we felt like children playing again, learning free from social constraint.

Quality and quantity of participation

Comparison of co-design workshops 1 and co-design workshop 2 reveals the importance of the quality and the quantity of participation. Qualities of participation are directly related to the setting of the group dynamics and the quality of a conversation: building common understanding alongside trust and respect; inclusiveness and power-balance relationships featuring honesty and empathic connections; comfortable, safe and friendly environments etc. Nevertheless, the number of participants also influences the co-design outcomes and the learning capabilities – the multiplicity of expertise and skills is directly linked to the quality and the quantity of participation. In co-design workshop 1 we had one participant, so the knowledge exchange through informal-mutual learning was limited, whereas in co-design workshop 2 there were twelve participants and hence many enriched conversations with divergent perspectives, suggesting that a correlation exists between participation quality/quantity and project scale – the resources available (financial, human, facilities etc.).

Conclusions

In this article, we have illustrated how the social environments supporting co-design situations during an action research project played a crucial role as sources influencing the co-design practice alongside participant learning. The use of CHAT as the theoretical lens to understand participation and learning in such social environments during the analysis facilitated the articulation of four designerly conditions to support informal-mutual learning: (i) choreography and orchestration of co-design activities; (ii) aesthetic dimension of design; (iii) playfulness and (iv) quality and quantity of participation. All of them connect and point to the research question which was concerned with how to create spaces for collaboration.

The choreography and orchestration of designerly activities are fields of the design-researcher. They include preparation and planning of co-design situations, designing the sequence of collective activities, understanding which objectives belong to each, designing the engagement tools and games, and their use (designerly techniques), etc. They also imply qualities of physical space. Figure 5 illustrates the differential qualities of the two venues used to host Co-design workshop 1 and Co-design workshop 2. The left-hand drawing (workshop 1) depicts a room with no connection to the outside, significantly smaller than the drawing on the right, while the layout provides a skein of possible social interactions. Additionally, the right-hand drawing (workshop 2) flows organically between inside and outside, introducing natural light, and visual and physical options to go outside and conduct outdoor activities.

Each detail matters when setting the social environment. The designerly activities, games and tools, as well as how they were designed, displayed and intended for collective use over time and space, all assisted in creating a performative and playful atmosphere. The designerly social environment transmitted stimuli to the participants, facilitating the process of changing the terms and tone of interactions, shifting the relational patterns towards an openness to learn from each other. The aesthetic dimension of design played a key role in this, dissolving hierarchical power relations and the societal constraints associated with each participant's usual role. Aesthetics is perceived here as an inherent dimension of design, disruptive (Markussen 2013) and capable of fostering boundary spaces (Calvo & Sclater 2020). Informal-mutual learning emerged once the boundary space was generated around activities 1 and 2 of co-design workshop 2. Here the participants proceeded through the process of boundary crossing, once the group of people subtly

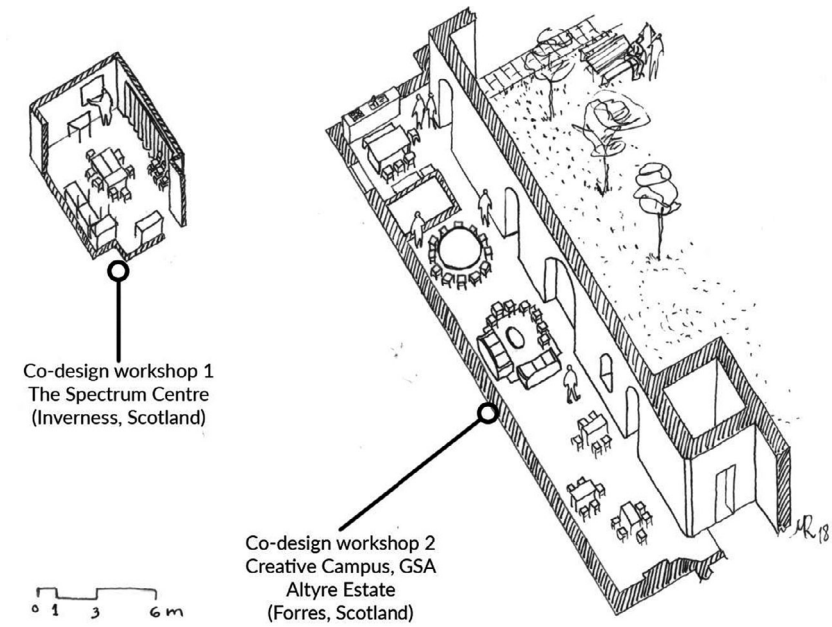

Figure 5
Comparison between co-design workshop 1 and 2, physical space qualities, 2017

and implicitly negotiated the rules of the conversation. This boundary space accumulated the knowledge of each participant and hence amplified the potential for mutual learning. Here the informal-mutual learning process sprang from the intermediary synergy in the process of building common understanding, trust and respect for the other participants. The activities, games and tools helped in the process of setting the terms of such a conversation, integrating the quieter voices while at the same time compressing the strong ones. This emerges from the quotation from participant eight: 'The consideration and the planning for the event, certainly the first event; It was people-based collaborating right from the start and making people feel comfortable, and offering opportunities for everybody to participate. Many interactive opportunities favoured the more theatrical performance of one person.'

In this study, the notions of learning explored in the section on social theories of learning were essential for the definition of informal-mutual learning, as it applied to this case study, hence, expanding our 'knowledgeability' (Wenger et al. 2015). Likewise, the set of design conditions for informal-mutual learning is where, we argue, design researchers and practitioners can directly intervene in the co-design process. With our design knowledge, competences, skills and dispositions, we can ensure and devise the appropriate social environment to support the creation of boundary spaces. Aligned with Lindström & Ståhl (2016), this insight advocates for an epistemological shift in the practice of design, away from drawing people into the co-design of 'things' and more towards making the focus of each co-design situation the facilitation of informal-mutual learning.

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