The connective role of improvisation in dealing with uncertainty during invention and design processes

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This paper explores the role of improvisation in design thinking for product design processes and design research methods. Improvisation is often at the core of practice-based and participatory design, permitting flexibility. The role of improvisation in the performing arts has received considerable academic attention, however its role in design processes has been neglected, because improvisation is often viewed as the second-best solution to design problems. This paper presents a framework for improvisation by surveying existing scholarship. Additionally, field study data collected between 2011 and 2016, primarily in Namibia and Australia, will be used to illustrate how improvisation is applied by practitioners during their art and design activities. The connective function of improvisation allows designers to negotiate, take risks, unmake and remake formations. This function enables the fluidity of design, to move from one moment in a process to the next, allowing designers to negotiate ways of work during uncertainty.

keywords: improvisation; design thinking; connective; solution

Introduction

This paper frames a concept of improvisation by surveying existing scholarship. Field study data collected between 2011 and 2016, primarily in Namibia and Australia, will be used to illustrate how improvisation is applied by practitioners during their art and design activities. In creative processes 'improvisation is the way we work', and improvisatory creativity of skilled practice is a foundation of design work or design thinking (Ingold 2007:...
This paper aims to illustrate the role of improvisation in moments of design thinking during invention. Improvisation also stimulates design thinking moments and their evolution, allowing practitioners to move, in multidirectional ways, from one step in a process to the next.

The role of improvisation in design processes is illuminated by the stories of Namibian and South Australian improvisers. The paper draws on field research that is situated in holistic artefact making. Makers are deeply involved in their social realities and they are not distanced from their conceptual and making processes. The improvisatory practices observed in Namibian and South Australian artefact making are guided by forward-thinking experimentation on the one hand and reflections on traditions on the other (Sarantou, 2014). Improvisation is often a response to pressing demands and notions of ‘having to do what needs to be done’ (ibid). Therefore, improvisation is closely related to the way designer-makers work, instead of being only an experience of play.

This paper will discuss the methodology employed in the research, followed by a framework for improvisation employing the literature and a discussion on improvisation’s role in design thinking. The four portraits of the designer-makers who participated in interviews will be used to demonstrate how the proposed framework functions in improvisation and Buchanan’s (2015:15) ‘design thinking moments’. The conclusion will indicate possibilities for further research as this paper’s focus is primarily on product design although the topic is relevant to both product and service design.

**Methodology**

Over a period of five years experienced craftspeople, designers and artists were interviewed to gain deeper insights into improvisatory practices and its role in their ways of work. Craftspeople, designers and artists were observed over a period of two months during a 2011 field study in Namibia, while the observations and interviews in South Australia occurred during an artist workshop with 42 participants. Ten individuals were interviewed in Namibia and twelve in South Australia. Six participants, of which four are represented in this paper due to word limitation, passionately narrated their improvisatory experiences. All the general findings discussed in this article derive from data collected during interviews and observations in the field.

Semi-structured questions to guide the loosely constructed conversations between the interviewee and researcher were used, allowing for richer data since the participants could sketch detailed stories that included personal aspects of their life and experiences; information that would otherwise have been lost in structured collection. Interviews lasted between 30 and 70 minutes and were conducted at a venue determined by the interviewee. The data collection methods included field notes, photographs, video recordings and their transcriptions. The identities of the participants are protected in the presentation of this research.

The paper draws on a grounded theory strategy to conduct research using methods of explication and emergence (Charmaz, 2008). Grounded theory is based on an iterative approach and emergent conceptual analysis of data captured in the field, coding supported by memo writing, and theoretical sampling (ibid.: 167). Concepts based in theory was supported by ongoing analysis of the data and adhering to a flexible approach during design research interventions. Thus, theoretical concepts are grounded in the
reality of data, giving grounded theory methodology ‘theory-observation compatibility’ (Corbin & Strauss, 1990:7).

Interviews and observations with practising designers allowed for deeper insights into the way these designer-makers worked and the role of improvisation in their making processes. Participants were not interviewed while they were making (artefacts) and thus their reflections on their improvisatory processes stem from the reconstruction of their making from memories translated via storytelling. This paper approaches the topic of improvisation by employing the selected philosophical approach, enactivism, to generate a holistic understanding of improvisory processes underpinned by cognitive science and experiential knowledge in a ‘complimentary and mutually informative way’ (Colombetti & Thompson, 2008:14). Processes are cognitive and affective structures that work together in embodied states as action, better understood as recurrent sensorimotor patterns (ibid). Improvisation is performative and subjective, ‘the lived experience of complexity’ and thus driven by emotions and personal aesthetic values (Montuori, 2003:238). Designers, as ‘makers, thinkers and doers’ (Buchanan 2015:12), use their cognitive and affective structures, thus design and making processes can be understood as interaction of mind, body and environment (Colombetti & Thompson, 2008).

However, in cognitive science the so-called ‘explanatory gap’ in understanding how to relate first person subjective experience to the third person ‘domain of brain, body and behaviour’ experience have not been adequately bridged (Lutz & Thompson, 2003:32). This presents a limitation in cognitive science research related to improvisation as these processes can only be explained and understood through memories and reinterpreted third-person reports, instead of first-person reports of experiences. The following framework of improvisation is presented by employing the literature to establish the elements that underpin this framework. However, these elements are in a complex and causal relationship with one another.

A framework of improvisation employing the literature

Process, motivation and knowing in action. In this paper improvisation will be explored as process, but also as part of design as process. Improvisatory processes are viewed through an enactive lens which means that cognition and emotion occur simultaneously and should not be separated, also not from the environment in which it occurs as improvisation responds to stimulus within an individual’s environment (Montuori, 2003; Peters, 2009). Processes emerge from repeated sensorimotor patterns that enable complex actions that are vital for improvisation such as perception, sense making and intuition. On the other hand, all processes are driven by motivation – mostly to discover something (Colombetti & Thompson, 2008; Leonard & Yorton, 2012). Cross (1982) established the difference between the ways designers work as synthesis in contrast to scientists who apply analysis in problem solving. He also explains that designers use solution oriented strategies that stem from their education and the traditions in which their practices are based, allowing them to draw on ‘designerly ways of knowing’ during action or making (Cross 1982:233). Although not opposed to experience and tacit knowledge, improvisation supports this ‘assemblage of parts and of more fluid processes of coming-into-being’ (Ingold, 2007:16).
**Experience and skill.** Experiences refer to activities and moments that leave lasting impressions on people while it also refers to the accumulation of knowledge and skill over time. Experience is gained from observing and analysing incidents over periods of time. Buchanan (2015:18) explains experience as ‘the accumulation of sensations and perceptions that fill our moments of engagement with products and services’. Experience, understood through the enactive approach, is set in an environment and refers to knowledge that is accumulated over time; perceived, sensed and felt. In moments of engagement experience is informed by sensations and perceptions (Buchanan 2015:18). Professional designers partially draw on their experiences and ‘specialist tacit knowing’ during design processes (Nimkulrat, Niedderer, Evans, 2015:5). Skill refers to doing something well in an expertly manner, often accomplished through the accumulation of experience and knowledge, underpinned by complex entanglements of the old and new, novelty and tradition. However, improvisors are ‘willing to break with the continuity of the old and new’ (Peters, 2009:118). Although improvisation is dependent on skill, it is often seen as something done in a ‘makeshift manner’, ‘making the best of things’ and being ‘the next best thing’, thus it is understood as a deviation from the original or best plan (Montuori, 2003:245). Importantly, improvisation draws on experience on the one hand, while practitioners gain new experiences by embarking on improvisatory processes on the other.

**Intuition.** Improvisors are driven by ‘quasi-spiritual’ forces and are strongly guided by imagination which is a ‘faculty of intuition’ (Peters 2009:134). Intuition is emotional experiences and automatic emotional judgements to these experiences (Dunn et al. 2010:1838). Colombetti and Thompson (2008) offer the view that intuition is emotional interpretations that allow the swift translation of cognitive translations and emotional states within seconds. Much of cognition processes happen intuitively and outside of consciousness, while knowledge and intuition involve an interplay of knowing and sensing (Sadler-Smith & Shefy, 2004). Thus, improvisation happens in moments of inspiration and realisation (Nachmanovitch, 1990; Ingold, 2007). The ‘inspirational art of interpretation’ lends to improvisation its playful dimensions which are often repetitive as paly is (Peters, 2009:156, 158).

**Recognition, promisingness and learning.** Interpretations, as part of improvisation, are important activities for social, product and service designers as improvisers find attractive the ‘recognition and re-appropriation of the given’ (Peters, 2009:117). Recognition is the identification of the known and research has shown that it plays a more important role in the execution of high level skill than the functioning of planning or looking-ahead-thinking (Gobet & Simon, 1996). Recognition is underpinned by social and cultural elements as recognition is a basic social need that has been denied to marginalised social groups globally (Honneth, 1996). Social and cultural recognition plays an important role in intuitive function during improvisatory processes that are essentially set in social and cultural environments. While improvisation asks for creative involvement and commitment, interpretation is the ‘recognition of opportunities that add value’ socially or for income generation purposes, Miettinen (2016:7) argues.

Improvisation is an ongoing process of learning and enquiry, ‘learning-in-organising’ that works by drawing on ‘knowledge and personal experience’ (Montuori, 2003:244). Chen et al. (2012) illustrates that promisingness can be learned when designer-makers recognise
how to identify promising ideas which is crucial for seeing through creative ideas. Designer-makers thus have learned, through experience or teaching, to recognise promisingness in environments where resources are scarce and processes are participatory. Promisingness is a crucial step in knowledge-building processes as it facilitates the identification of promising creative directions, thus avoiding the waste of time and other resources (Chen et al., 2012). Promisingness therefore is solution-oriented while the central idea of improvisation is accepting what is offered and, if anything, adding to it (Leonard & Yorton, 2012).

*Thereness and time.* Improvisors have mastered working with what is ‘there’, the immediate resources available to them, including an important element of improvisation, which is the temporal (Peters, 2009). Thereness refers not only to the given, immediate ‘natural’, social and cultural environments in which improvisors function, but also to skill, knowledge, processes and materials they have access to. Peters (2009) mentions that thereness is always presented afresh in creative processes, to lose oneself in distracted actions and moments of improvisation. Improvisation is often connected to the catchphrase ‘being in the moment’ (Peters, 2009:135), but it has several temporal dimensions since it is also referred to as ‘the time of inspiration’, ‘now’ and ‘from the time’ or ‘a moment’, thus coming about in moments that appear to be ‘outside of time’ (Nachmanovitch, 2003:18). The timing to ensure the work of working requires improvisors to act and embrace states of becoming in the multidirectional to-ing and fro-ing that practical work environments often require. Improvisation asks of designers to be entangled with the beauty of intersubjective dialogue in processes where thinking is present, but often outside of itself and the moment of the work. Improvisation requires patience and the ability to judge when is the best moment to act (Peters, 2009:167).

*Change, multidirectionality and agility.* Improvisation is about embracing change and diverging pathways (Montuori, 2003). The freedom of play, to be lost in strangeness, demands of the individual to embrace rigor, exactness and accuracy during the ‘ever multiplying detours of thinking’ (Peters, 2009:161). Although experiences form and inform designers’ actions alongside the traditions they work in, it is improvisation that drives designers from one step to another to ensure fluidity, albeit in multidirectional ways. The ‘practice of improvisation itself is unable to invent a good concept of improvisation’ as it will not guarantee good improvisation to come about (Peters, 2009:147). This statement is based on the multidirectional ability of improvisation, lending the activity to be viewed as playful, spontaneous, imaginative and a second-best solution to the ordered design frameworks that exist. However, Peters (2009) explains that these elements lend improvisors the ability to think on their feet, next to flexibility and agility, navigating the unknown (Leonard & Yorton, 2015).

*Experimentalism, risk and control.* Improvisation is underpinned by experience, traditions and risk taking during experimentation (Montuori, 2003). Experimentalism refers to unfinalised and untried techniques and ideas, but also invention. Improvisers should be bold, have courage to take the next step, embrace uncertainty and believe in their skills and experiences to invest in risks (Montuori, 2003). Improvisation asks of a designer not to be ‘too attached to the outcome’ (Nachmanovitch, 1991:19), but value lies in the ability to ‘tumble into the void in the vain hope that some kind of beginning can be marked’, which Peters (2009) illustrates is the freedom improvisation offers as the ‘enactment of the
beginning of art’ (Peters, 2009:131). The recognition of promisingness as a crucial step in knowledge-building processes assist designer-makers to take successful risks (Chen et al. 2012). The evaluation of risk forms part of the knowledge-creation process on the one hand (ibid.), but improvisation is also perfectly suited for navigating the unknown as a bad idea can form the bridge to new and novel ideas (Leonard & Yorton, 2015). Taking risk often means having to reconsider personal, social or organisational control and overcoming personal fears of failure (ibid.).

Judgement, failure and evaluation. The most significant threat to creativity is the fear of failure, but failure should be accepted as playing a role in creative processes, say Leonard and Yorton (2015). The fear of failure can be eliminated if pressures of self and social judgement are minimised. Judgement is on the one hand the ability to make informed decisions, but on the other it may be associated with disapproval. During design moments judgement is a crucial step to determine desirability, feasibility and viability of an innovation (Buchanan, 2015). The final moment in design thinking of Buchanan’s model is evaluation, which is associated with the determination of value and the worth of innovation, on both ethical and political levels (Buchanan, 2015:15).

**Improvisation’s role in design thinking**

Creative processes are constituted of thinking and feeling, action and making within complex environments. Improvisation allows designers to know as they go during their ongoing paths of discovery, making and re-making (Ingold, 2007), thus enabling designer-makers to connect or disconnect steps and moments, think and feel their ways through, move on in whichever direction; backwards, forwards, up, down, inside or out.

Design thinking is an ‘art of creative enquiry’ (Buchanan, 2015:15). The following diagram illustrates how improvisation functions in ‘design thinking moments’ (ibid.). The four design thinking moments of ‘invention’, ‘judgement’, ‘connection and development’, ‘integration and evaluation’ is proposed by Buchanan (ibid.). The diagram illustrates how improvisation connects and disconnects these fluid design thinking moments irrespective of direction.

![Figure 1](image-url) *Figure 1* This diagram is based on Buchanan’s (2015:15) ‘design moments’. Improvisation is illustrated in design thinking as a multidirectional process that
enables fluidity in design processes, whether connecting, disconnecting or reconnecting design moments

**Designer-makers’ portraits**
The four portraits of interviewed designer-makers illustrate how improvisation comes into play when designers think through their design processes. Conversations with Samara, Patema, Ciara and Lisa were recorded and transcribed during field studies (January-February 2011, February and October 2016). These designer-makers’ ‘worlds’ (Becker, 1976:703) were observed through their practices in their studios in Namibia, or during workshop settings in Outback South Australia.

The observations and interviews revealed that participants, who were professional or emerging designers between the ages of 30 and 65, were involved in complex, multidirectional art and design processes, especially their improvisatory practices, relating to their social and economic sustainability. This means that the participants were drawing on their design practices for the cultural and material value they gain from design processes. Being in contact with cultural elements and materials supported them socially and emotionally, while economic opportunity was an additional benefit gained from their design activities.

The narrative representations of the participant interviews aim to illustrate the social, cultural and economic contexts in which the designer-makers function, while the narrative commentaries support analytical processes for gaining an understanding of improvisation. The narrative approach renders audible the voices of these improvisors, but it also illustrates the sophisticated ways in which designer-makers work despite their marginal circumstances.

**Samara**
During 2005, in her final year of visual art studies, Samara undertook creative research on Namibian cultural influences, thus returning to the village where she grew up. She interviewed several elders to document traditional Kavango techniques for dyeing fibres and textiles. Reconnecting with traditional Kavango artefacts such as baskets, woodcarving and pots became sources of inspiration for her textile designs. Kavango elders and their stories from her ethnic community also influenced her design processes. She explains:

‘I get [these motifs] from traditional baskets that the Ovambo and the Kavango people do and the traditional clay pots that the Kavango and Ovambo people do. They’re normally very bold and they’re very systematic next to each other, eh, in a very registered manner, but I never really try to use it in the same way. I’ll take it, but play around with the repetition just to come up with something different. So sometimes it looks very distorted, but if you look very closely to the motif and the print you will actually realise where I got the print [from].’

Invention, a phase of design thinking, is clearly illustrated in Samara’s narrative. She produces high end designer textiles from natural fibres, and she uses natural dyes and
techniques that she developed over the years, drawing on traditional textile knowledge. Symbols, patterns and materials used in crafts from the northern regions of Namibia also feature in her textile designs. Samara invents by steering away from what she already created or other established forms of textile design (Buchanan, 2015). She draws on improvisation when she feels limited in her creative approaches, or ‘stuck in a little box’. In finding solutions to her design problems improvisation allows her moments and spaces during which she lets her creative impulses on the loose to ‘play around’ with patterns and fabric dyes. Improvisatory processes allow her to investigate new avenues for the materialities and processes she engages in and experiments with. She says:

‘You know you cannot really have an accident. You can always try to fix something and try to make it interesting. That was really fascinating for me and I enjoyed the whole process of trying to, eh, do something from nothing. And sometimes it’s a flop. It’s not how you imagined it, but then still, you work with it and come to a solution or the solution. And this is, I think, what always struck me, what made it, you know? That grip. It gave me that. It gripped me. I couldn’t let go. I really want to do more of that. Experimenting and just coming up with new ideas all the time.’

Samara acknowledged that her design and making usually include improvisatory processes and experimentation, because they allow creative expression. Her reflection on improvisation illustrates her positive attitude towards experimentation. Apart from intuition, improvisation responds to the stimulus from within her cultural and design environments (Montuori, 2003; Peters 2009). Her textiles speak of ongoing process of learning and enquiry, learning-in-organising by attempting new solutions that draw on her skills, knowledge and personal experiences (Montuori, 2003:244). In Samara’s story she reveals the ‘gripping’ moments during which she finds solutions to her design problems, which motivate her to continue these processes of learning and discovery.

Improvisation, or *improvisus*, refers to ‘the unforeseen, the ambiguous or the uncertain’ (Nachmanovitch, 1991:240). Samara’s views that a ‘flop’ is not possible and ‘accidents’ don’t exist are brave, because she opens herself up to stimuli in her environment, the unforeseen and ambiguous situations she experiences during making. As a result, improvisation allows her to embrace risk and so her textile design becomes ‘gripping’ and significant experiences during which she embraces uncertainty to find solutions to her design problems.

Samara’s story illustrates that ‘improvisation is spontaneous action that does not depend on a specific outcome’, thus her spontaneous processes are not strained, because she is not obsessively attached to the outcome (Peters 2009:125; Nachmanovitch, 1991:19). Although improvisation is used, in Samara’s case, as an approach to solve design problems, improvisation is often interpreted as happening on the spur of the moment. But in reality, improvisation is a sober, pragmatic activity many designer-makers draw on to overcome limitations.

Improvisation has several temporal dimensions since it is also referred to as extemporisation, meaning ‘the time of inspiration’ (Nachmanovitch, 2003:18). Samara’s narrative illuminates the role of improvisation as being unmeasurable moments in time during which individuals are motivated by immediate stimuli in their environments, such
as cultural patterns from baskets and clay pots (in her case). Other temporal dimensions Samara refers to are that improvisatory practices encourage her to experience moments of making ‘outside of time’, to ‘do more of that’, thereby sustaining her recurring and ‘gripping’ design moments and invention.

Another temporal dimension of improvisation that influences Samara’s decisions while making and designing artefacts is that improvisatory processes assist her in moments of time constraint to find ‘the’ spontaneous design solution. The temporal dimension Samara refers to is the economy of time and the pressing reality that time remains a limited resource in her life and practices. She argues: ‘So a lot of times you have to go through a process of problem solving, and I didn’t have time, so I had to improvise again. So I save time, but I had to improvise at the same time to save time’. In this statement Samara considers improvisation to be moments in time that saves her most valuable resource which is time.

In Samara’s narratives elements of Buchahan’s additional three design moments are detectable. She uses judgement to consider the feasibility of her designs by measuring her time. The design moments ‘connection and development’ are also detected as she considers the usability and desirability of her textiles as she approves the appealing distortion created using overlapping and cleverly-designed patterns in her textiles.

*Patema*

In reflecting on her fashion design practices, Patema explained her work approach:

> ‘Sometimes I create something. I see something and then it triggers something in my mind. Sometimes I will just look at a fabric and I will think: “Wow, this fabric will look nice if it is made into such and such a thing.” So the fabric itself, visually I’ve seen it, but it brings ideas into me, of what I can make. And then the idea of adding the ondelela fabric to it just came about, because I remember when I had the linen I cut it, then I looked and there was the ondelela fabric. And I took it, overlayed it and it worked. When I took this [black linen men’s shirt] and folded it, I saw the shape, so this one also came by accident. It’s not like I had intended to, but when I saw that it looks good, then I realised in the process of making that I do this. The design completely changed. So, that is what I do. I improvise by trial and error. I go forwards, backwards, forwards, backwards, like that. It’s my visual perception. If I look at something and it doesn’t please me, then I change it. I go forwards, backwards, forwards, backwards, like that.’

Patema’s story illustrates how stimuli in her environment inspire her to create ‘something’. Similar to Samara, Patema also refers to one of her design outcomes as the result of an ‘accident’. She acknowledges that her work processes are often guided by ‘trial and error’. According to Patema, improvisation is a significant ingredient of her making, yet improvisation is often seen as something done in a makeshift manner or as the second-best solution, a deviation from the original or best plan. However, Patema does not perceive working in such a fashion as makeshift or the second-best solution. This is what she does and ‘the way [she] work[s]’ (Ingold & Hallam, 2007:12). Connected to her intuition, she sees and recognises when something ‘works’, illustrated by the clever way
she added the *ondelela* (a traditional vertically striped Ovambo textile) trim on the hem of a denim skirt. When this skirt is worn the sway of the wide hem, set off with the vertical stripes of the ondelela trim, will create a dynamic and perhaps playful visual effect when it is worn.

Improvisatory processes do not follow planned and ordered routes, but are often multidirectional. Patema explains how she moves in multiple directions during her moments of practising design and design thinking (‘I go forwards, backwards, forwards, backwards’). Her story also illustrates that improvisation is often an ongoing process. The multidirectional dimensions of improvisation refer to a temporality which is not linear. As a result, improvisation cannot be planned – it happens in the moment and is realised in the present. Her working process was determined by how the moment she worked in unfolded. She works unrestricted and free from pre-set expectations, including her own. She allows herself freedom to get done what she needs to do. Improvisation is spontaneous action that does not depend on specific outcomes as both Patema and Samara’s narratives illustrate, but it embraces invention as it breaks with dichotomies of ‘old’ and ‘new’.

**Ciara**

Ciara experiments in the way she does due to the confidence she has in the design skills and experiences she has acquired during her practice. As talented designer she practices both as a fashion and graphic designer. Improvisers have to trust in their design abilities that are shaped by the traditions of rote learning and design training on the one hand, and intuition and imagination on the other, enabling them to take risks and steer into the unknown. For Ciara it is a similar situation and she explains:

‘A lot of the times when you do a collection the design seems to change as you work, and I find that interesting. I like how it evolves. You know, you make it better. You keep adding, and maybe you have a new idea, you don’t stick to what you originally had, but if you open yourself to change, uh, it’s how I design. [...] Sometimes you don’t have time to research, you don’t have time to think about it too much, so you’re also taking risk and you go “OK, I have to go for this”, because it has to get done. Under pressure you are a little bit more creative and productive because you take risks. Improvisation does not only have to happen only under pressure, it can also happen with time, so you can have a little bit more time to think about things.’

Elements of risk and openness to change, which is an essential ingredient for improvisation and working through design processes, was present in all the narratives of the research participants introduced in this article (Adamson 2007). All their narratives also reveal their willingness not to obsessively control the outcomes of their artefacts. They are willing to journey via multidirectional avenues to discover new outcomes, solve design problems, grow their practices and explore their identities, as Ciara illustrates. She prefers open-ended processes, creating artefacts through discovery and embracing risks. She seeks out new experiences (‘I have to go for this’) by embracing fluidity and change simultaneously through to-and-fro steps. She prefers to be able to question herself, her
aims and approaches. There is a connection between improvisation and complexities offered through new experiences due to the performative and subjective nature of improvisation. Improvisors are driven by emotions and personal aesthetic values as the stories of all the designer-makers reveal. Within improvisation’s particular temporal dimension, memories, intentions and intuition are combined when designers take on risks during invention.

Another meaning connected to improvisation is to make something up as you go along, which means that an individual’s histories and past experiences guide their intuition, which is always operating in the present to achieve an intended aim which influences or postulates future experiences. The role of experience in improvisation illustrates a positive feedback loop; improvisation draws on a practitioner’s experience, simultaneously, their use of improvisation extends a practitioner’s experience. This is illustrated in Samara and Chiara’s narratives of taking risks under pressure and venturing into new territories of experimentation.

All four designer-makers’ narrative commentaries illustrate that the prerequisites for improvisation, as highlighted by Nachmanovitch, Montuori, Ingold and Peters, are not necessarily determined by free play. For Ciara, improvisation is often part of her working under pressure because ‘it has to get done’. A sense of playfulness is not always present in the designer-makers’ improvised moments, but rather a sense of seriousness and a necessity to get things done during working processes. These pressures are often driven by the need to earn their living or time limitations resulting from artefact marketing and sales deadlines.

However, Ciara acknowledges that rare occasions do arise when improvisation comes about because she is able to allow more time ‘to think about things’, an idea that resonates with Adamson’s (2007) concept of ‘thinking through craft’. This concept is connected to the design thinking moments of Buchanan as it includes invention, judgement and development. All the designer-makers’ processes discussed in this article illustrate how they embrace improvisation to think through their design and invention (for example the use of resources such as skills and materials), while being guided by visual perceptions, critical analysis, judgement and decision making.

Lisa

Explaining the connections between her pottery practices and her design thinking, Lisa’s ideas about improvisation is critical. At the same time, being a skilled potter who humbly refers to her practices as ‘dabbling’, she strongly identifies with her creative practices while she also feels that the people who use her pots should be able to relate to them. In her design thinking Lisa employs moments of judgement, connection and development (Buchanan 2015). She thinks through her craft (Adamson 2007) and design by assessing the desirability of her outcomes, their usefulness and the emotional satisfaction gained from using them (Buchanan, 2015:15). Lisa explains:

‘My pots, they’re all little bits of me, so I want them to go somewhere nice. I mean they must feel good when you use them. So if you don’t get that feeling of enjoyment out of something you use, why use it? It’s nice is the shape’s good and it gives you a good feeling when you pick it up. Hopefully
the people who buy these things are people who can, hmm, feel a sort of familiarity with them.’

The evaluation of her design illustrates Lisa’s ability to think in designerly ways (Cross, 1982). Although she is critical of the way improvisation works, perhaps due the misconception that improvisation is a second-class design activity instead of a connective tool in design processes, Lisa admits that she uses improvisation as ‘layers of ideas’. She explains:

‘I like to build on what I did before ... it’s not sort of an isolated incident. I don’t abstractly improvise. I suppose I have these layers of ideas which I draw on and some of them are suitable for that situation and some are not. I also have these other layers of improvisation in that they’re already ideas that I have thought about that I could do if I don’t like what I’m doing. There must be some sort of layers, of a dictionary of ideas, in there somewhere to sift through and rearrange.’

Lisa argues that improvisation relates to isolated incidents, admitting that she has some ideas that she may use as an additional solution when she does not like her outcomes. She equates ‘layers of improvisation’ to a ‘dictionary of ideas’, making a connection to thinking and language. However, the use of language is action. This means that her design is action, thinking and remembering. In other words, Lisa associates improvisation with design thinking. Lisa prefers more pragmatic processes where she starts her design with a preconceived idea and her actions do not ‘go off at another tangent’ like some artists. She explains:

‘I think you get the sort of really exciting artists who are really creative and they come up with weird ideas and they really go into it and then they go off at another tangent. So, it’s like a free fling. And then we come back and carry on with the serious work. So, as I work I have an idea and I start. If you don’t have an idea when you start, you’re lost. If you don’t have a preconceived idea about where you’re going and what you’re doing, then you end up not making anything.’

Lisa asserts that some ‘exciting’ artists ‘really go into it’, recognising the ‘being in the moment’ element of improvisation (Peters, 2009:134). Lisa prefers to start with an idea instead of being lost; and then to revert to the next best plan if she does not like her outcomes. She also considers improvisatory processes outside of ‘serious work’, but acknowledges that she draws on the language of improvisation that she collected over many years of design practice to connect at least some of her design thinking processes to Buchanan’s invention, judgement, connection, development and evaluation phases.
Table 1  Table illustrating which elements of the improvisation framework applies to the interviewees

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<tr>
<th>Elements of the improvisation framework</th>
<th>Samara</th>
<th>Patema</th>
<th>Ciara</th>
<th>Lisa</th>
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<td>Process, motivation and knowing in action</td>
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<td>Experience and skill</td>
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<td>Recognition, promisingness and learning</td>
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<td>Thereness and time</td>
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<td>Change, multidirectionality and agility</td>
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It is difficult to identify the work of intuition in the interviewees’ processes, but all four draw on the first two elements including process, motivation and knowing in action, experience and skill. Not all the interviewees refer to time, but all rely on the elements of recognition and an understanding of promisingness. Lisa, as the oldest of the four interviewees in her mid-sixties, shows little evidence of an open attitude to experimentalism and risk taking, while she prefers her processes to be well-defined and ordered before she starts.

Conclusion
This paper aims to address the often-ad hoc approaches designers employ in participatory and development contexts. They cope with often scarce resources, embracing the realities and practicalities in their field of work. Improvisation should be embraced as a design thinking activity that enables invention, but also connects the various design thinking phases into cohesive and fluid processes of all designers. The way designers work, illustrated by Ingold (2007) and Montuori (2003), is possible by moving from one step, scenario or moment to the next. Designers have access to multiple frameworks and resources for design solutions in their various fields, but little or no attention has been given to the elements that make these processes possible in practice. It is here that improvisation should be considered a valuable and viable solution instead of a second-best outcome to design problems.

Problem solving that draws on personal design experiences in the field, with backward-looking traditions of practice and memories on the one hand and the forward-looking leaping into the unknown, risk taking, and drawing on imagination and intuition on the other, all belong to the concept of improvisation. Whether organisational environments in need of product-service design, or development contexts in need of social design, improvisation remains solution orientated, an ingredient for ‘designerly ways of thinking’ (Cross 1982), and the connective, but underestimated, tool for cohesiveness in design processes. The potent element of improvisation, agility, does not mean organisational anarchy (Peters 2009), but it should be embraced in all areas of design, including organisational contexts that in essence consists of environments that are driven by participatory processes in need of the optimisation of resources.
Improvisation supports the understanding and management of uncertainty in design thinking and invention. The theorisation of improvisation presents new knowledge about the subject in the field of design. It is essential that improvisatory methods and processes are extended to the field of service design through further research, as well as design research through the development and testing of approaches. The knowledge about improvisation creates a familiarity with the concept, minimising the ‘moments of dread’ that are associated with facing the unfamiliar (Peters 2009:125).

References

About the Authors

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