

From design studies to resilient craft practice in the digital age

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Design has been defined as “courses of action aimed at changing existing situations into preferred ones”. Acknowledging the relationship between design and craft, we use this affirmative definition as motivation for a qualitative systematic literature review on craft and design in the digital age. This enquiry is framed by the need to establish and synthesise existing academic discourse in the field as a baseline for further research in mitigation of the challenges faced by South African craft practitioners operating in globalised digital economies. Following a search in academic databases, using the keywords “design studies” and “craft” and “digital” a two stage screening process was used to select the literature for inclusion in this review. Only academic articles published between 2007 and 2017 that refer to at least two subjects out of: design studies, craft practice and making in the digital era were included. A meta-ethnography method was used as a qualitative synthesis technique (Dixon-Woods et al. 2006) in which themes found in the literature are mapped in order to foreground relationships. Maps or cartographies are appropriate in nomadic theory, which according to Braidotti (2011) underpins the globalised digital age and seeks affirmative creative alternatives. The findings are presented as a narrative and recommendations are made as catalysts for further research.

Key words: craft, design, digital

Van ontwerpstudies tot aanpasbare handwerkpraktyk in die digitale era

Ontwerp word gedefinieer as “optredes wat daarop gemik is om bestaande situasies in gewenste situasies te verander”. Met erkenning van die verwantskap tussen ontwerp en handwerk, gebruik ons hierdie bevestigende definisie as ’n motivering vir ’n kwalitatiewe sistematiese literatuuroorsig van handwerk en ontwerp in die digitale era. Hierdie ondersoek is ontwerp as gevolg van die behoefte om die bestaande akademiese diskoers op hierdie gebied te vestig en te sintetiseer as grondlyn vir verdere navorsing om die uitdagings te temper wat in geglobaliseerde digitale ekonomieë deur Suid-Afrikaanse handwerkpraktisyns ervaar word. ’n Soektog met die sleutelwoorde “ontwerp studies” en “handwerk” en “digitaal” is in akademiese databasisse uitgevoer, waarna ’n keuringsproses in twee stadiums gebruik is om literatuur vir insluiting by hierdie oorsig te kies. Slegs volledige akademiese artikels wat tussen 2007 en 2017 gepubliseer is, en wat na ten minste twee onderwerpe uit: ontwerp studies, die beoefening en maak van handwerk en die digitale era verwys is ingesluit. ’n Meta-etnografiese metode is as ’n kwalitatiewe sintesetegniek (Dixon-Woods et al. 2006) gebruik waarin temas wat in die literatuur gevind is, gekarteer is om verwantskappe na vore te bring. Kaarte of kartografie is toepaslik in nomadiese teorie, wat volgens Braidotti (2011) die grondslag van die geglobaliseerde digitale era is en bevestigende skeppende alternatiewe vereis. Die bevindings word as ’n narratief aangebied en aanbevelings word as katalisators vir verdere navorsing daargestel.

Sleutelwoorde: handwerk, ontwerp, digitaal

The need to establish existing academic discourse as a baseline for further research has framed this enquiry in the fields of craft and design. In South African craft, research undertaken by Stevens (2007) proposes a model for successful South African craft enterprises and identifies threats and challenges faced by this sector. One of the limitations of this research points to responses to the fast paced change of globalised economies in the digital age. This context has prompted the question guiding this review: What is the progress of research in the field of craft and design in globalised economies facilitated by digital technology? This literature review is therefore limited to accessible, English language academic literature published since 2007.

An initial online search was done using academic databases available through the university library which included Ebsco host, Woldcat and Google Scholar using the keywords “design studies” and “craft” and “digital” to include only English language, accessible full texts published since 2007. Additional searches were conducted using the Mendeley, Researchgate as well as the Academia.edu online platforms. A preliminary review of titles was done to eliminate articles not in the field of design studies or craft. The resultant list was then inserted into a spreadsheet. This spreadsheet was used to sort the articles for inclusion according to date of publication, title, keywords, methodology employed and relevance of the abstract. The remaining full texts were read and screened for inclusion or exclusion. For the purpose of this review, academic literature refers to published conference proceedings, journal articles, and chapters in edited books, three Masters dissertations (Connor 2008; Pfeiffer 2009; Norton 2014) were also considered. For inclusion, articles had to refer to at least two of the three subjects in question, namely design studies, craft and digital technology. Using a bibliographic snowballing technique additional articles were found from references in the articles under review, these were included only if they met the pre-defined search and inclusion criteria.

Forty nine articles were selected using the described inclusion criteria and were subsequently reviewed; of these, five articles refer to design and craft, nine to design and digital technology, twenty six to craft and digital technology and the remaining nine refer to craft, design and digital technology. All of the articles describe qualitative research. Design has always been closely associated with technology, the increased interest evidenced by the number of articles dedicated to craft and digital technology is significant of the impact of these technologies in this field.

In this section we have described the use of a spreadsheet as a tool to sort the articles for review and to establish the need for research in this field. In the following section we discuss the use of mapping methods as data analysis tools, and then offer a brief description of nomadic theory in support of the use of mapping techniques to analyse data in the digital age.

Becoming resilient

A meta-ethnography method was used as described by Dixon-Woods et al (2006) to qualitatively synthesise the selected articles. The full articles were read and reread and the emerging themes were highlighted and assigned descriptive (open) codes. In the next stage, the data and codes were revisited and grouped according to broad themes or (axial) codes. These themes were mapped in order to foreground patterns and relationships. Mapping methods are used in design studies as data analysis tools. By creating visual diagrams one is able to make connections, which may not be immediately evident in audio or textual data (Curedale 2013; Fendler 2013). Mapping is also central to nomadic thought where process is foregrounded in relation to concept.

According to Braidotti (2011) nomadic theory is premised by a process ontology and mobility of thought necessary to confront the constant change synonymous with the digital age. Nomadic theory is underpinned by the philosophy of Deleuze and Guattari (1987). In *A Thousand Plateaus*, the image of a rhizome is used to describe multiplicities, which connected to other multiplicities make up plateaus. Rhizomes have certain characteristics which can help us to describe digital contexts: a rhizome is made up of diverse parts, any point on a rhizome can be connected to any other, it is made up of dimensions or directions in motion, if broken a rhizome will grow again from another point, it is unbound and outward growing so it is best represented by a map and it is not governed by a structural model, therefore there is no predefined pattern. The ability of a rhizome to recover after a setback speaks to resilience. In this paper we consider this notion of resilience in mitigation of the challenges faced by South African craft enterprises operating in globalized digitally mediated economies.

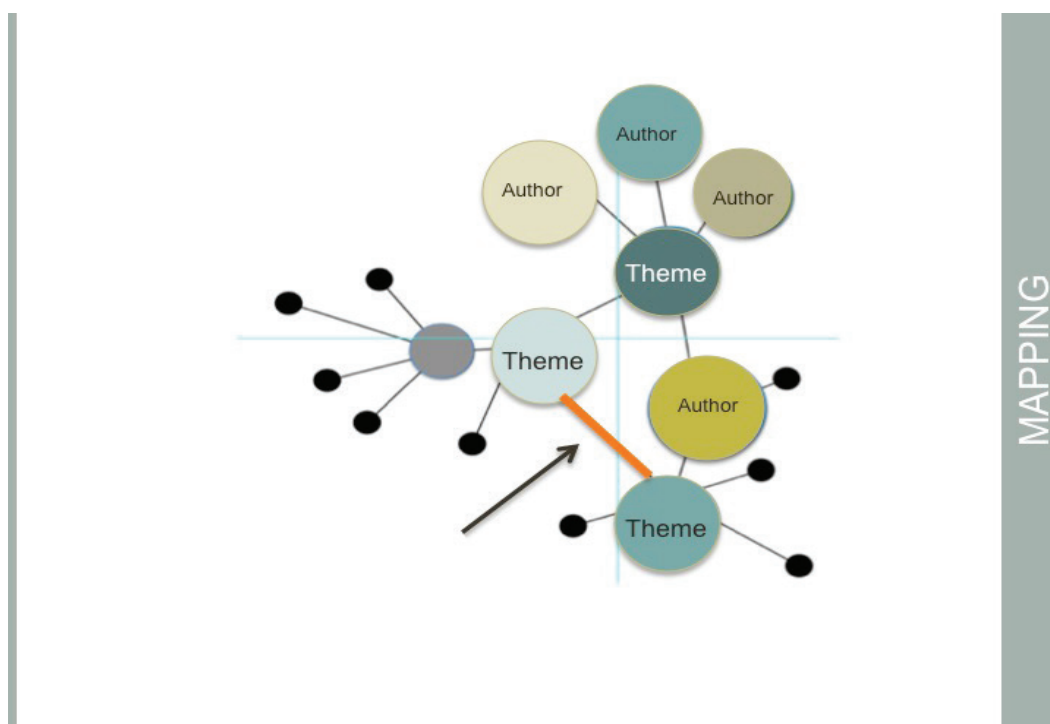


Figure 1
Mapping in order to foreground connections (graphic by the authors).

In craft theory, Sennet (2008) refers to humankind’s tendency towards doing a job well for its own sake, this ability enables the craftsperson to reach high levels of skill and accomplishment by repeatedly doing something over a period of time. Similarly in design studies, Simon (1996) defines design as “courses of action aimed at changing existing situations into preferred ones”. In both instances there is an intrinsic motivation towards improvement, an attitude of not giving up in which a degree of resilience is implied. Nomadic theory offers a non-hierarchical ontological lens, which supports this motivation as it seeks affirmative creative alternatives (Braidotti 2011). This potential is expressed as a state of “becoming”, in this instance we refer to becoming resilient, as a quality needed for South African craft practitioners to be sustainable in globalized digital economies.

Craft 3.0

The South African 2017 *Draft White paper on Arts Culture and Heritage*, albeit in draft format, still refers to the creative sector as traditional and contemporary art, craft art, functional wares and souvenirs (DAC 2017). For the purpose of this paper we use the categories proposed by Ferrara (2011). Although Ferrara’s categories include all the aforementioned ones, they shift away from old binaries of craft versus art and craft versus design to include the varied hybrids which now form part of this creative sector:

Do it yourself (DIY) craft includes not only recreational craft and craft carried out at home to earn income, but also craft that makes use of recycled and repurposed materials. This could also be the hacking of materials and technologies in order to produce and make new artefacts. An approach of “mend and make do” is often accompanied by a resistance to consumerism and its associated environmental degradation (Carr and Gibson 2016).

Technological craft includes all forms of traditional crafts and can be material or process driven. These crafts require the skill obtained by repetitive actions over a period of time (Sennet 2008) and usually involve experimentation and a degree of risk (Pye 1968).

Electronic craft or digital craft is associated with the democratisation of design and includes all forms of digital technologies. These range from online platforms for the sharing of skills and techniques to digital printing processes and rapid manufacturing (Pfeiffer 2009; Gershenfeld 2012; Chen et al. 2015). The maker movement, is also represented in this category as an interdisciplinary field (Richardson 2016).

Digital effects and affects

The mass production of consumer goods in the mid 20th century saw the role of the designer surpassing that of the craftsman for the manufacturing of functional objects. The conceptualisation or design and the production of the artefact were separated in order for products to be manufactured cheaply and in large quantities for mass consumption (Sennett 2008; Cardoso 2009). Tasks of the mind (design) were thus separated from tasks of the hand or body (production), into a disembodied state synonymous with industrialization. Cardoso (2009) attributes this to the Western, humanist tradition of elevating mind over matter, in this setting, it has been argued that this separation led to a conceptual “othering” of craft with craft considered as “lesser than” (Bean & Rosner 2012) or “in opposition to” design and manufacturing (Carr and Gibson 2016).

In a digitally mediated context authors are reconsidering this relationship and argue that craft and design are being brought into closer proximity and that the boundaries between these disciplines have blurred. Craft and design are now considered as overlapping practices (Cardoso 2009; Shiner 2012; Kettley 2016) and in this new paradigm it is proposed that design could even be viewed as a form of craft (Bean and Rosner 2012). Unlike in previous craft movements, technology, including digital production, is no longer seen in opposition to craft and artisanal industry. Today more pragmatic approaches are favoured in which designs can be executed in alternative ways. Ferrara (2011) considers this as an imperative if craft practitioners are to survive in globalised economies.

Bonnardel and Zenasni (2010) found that digital technologies support all stages of the iterative design process and therefore can enhance this process. Whereas these technologies were only accessible to a select group of design professionals, they are now freely available and open source software and digital platforms have played a role in democratising design. Open design refers to the design of software and products collectively by sharing information openly online. These co-created designs are aimed at solving complex problems for various applications including design for communities in need, developing advanced solutions not possible without multidisciplinary collaboration and for the sharing of files for localised production. Closely aligned to this phenomenon is the maker movement in which technological artefacts are made or improved using post-production components as a sustainable practice (Ferrara 2011).

The impact of digital technologies on production methods have not gone unnoticed by design educators and curricula are being adapted to suit. The Future Craft programme introduced at MIT addresses sustainability in product design using digital tools and processes to address public design, local design within communities, personal wearable technologies and product ethnographies (Bonnani, Parkes & Ishii 2008). At the University of Brighton the previously distinct disciplines of craft and design have been merged in a post-disciplinary design and craft

curriculum which uses design thinking as a base for experimentation in shared collaborative processes (Kermik 2012).

Whilst these articles present the benefits of digital technologies in the fields of craft and design, in contrast, Lindtner, S. Bardzell and J. Bardzell (2016) caution against “technosolutionism” whereby Western technology is considered as the solution for all difficult social problems. They consider this a form of colonialism, instead they propose considering (digital) making as a “global assemblage” which according to Deleuze and Guattari implies “heterogeneity, contingency, instability, partiality and situatedness”. They argue for local approaches which are both technically relevant yet human centred (Lindtner et al 2016). One example of this approach is found in the work of Rosner and Ryokai (2008). By embedding technology into hand knitted articles they are able to capture information about process and embed narratives that strengthen the emotional connection with the handmade object without changing the look and feel of the knitted artefact. The result is a blurring of boundaries between the knitted object, embedded digital information, and the knitters’ intentions (2009). This emotional connection associated with handcrafted artefacts is also acknowledged by other authors (Treadaway 2007; Sennett 2009; Brattich 2010; Zoran 2013; Townsend & Niedderer 2016).

Digital technologies have supported a crafts revival as a response to mass production, mass consumption, environmental concerns as well as the economic downturn of 2008. The internet has enabled online virtual spaces where craft enthusiasts can meet, share practice, access information, and materials and gain access to marketing platforms for finished items to be sold online (Connor 2008; Hackney 2013; Luckman 2013; Norton 2014). Brattich (2010) discusses the role of craft in developing values through practices by referring to the connections made and opportunities for mentorship that occur within communities.

Online communities provide fertile ground for craft based activism and political engagement with social and environmental concerns expressed online through blogging and craft related websites (Connor 2008; Hackney 2013). This resurged tendency towards activism has emerged as anti-capitalism and anti-authoritarian craftivism and includes practices of resourcefulness, local knowledge and non-hierarchical organisational forms (Brattich 2010). The value of craft lies in its ability to affect. This can be viewed as an alternative to capital as a maker of value. This alternative value can be found through participation and bottom up approaches such as the gift economy, small scale production, circulation and cooperation. These practices can pave the way for new economic models (Brattich 2010; Von Busch 2010). Designers are no longer the only ones designing and users are no longer just consumers but productive “prosumers”.

Virtual guilds

Online marketing sites such as Etsy have provided alternative economic models (Luckman 2013; Norton 2014). Etsy is an online community with no gatekeeping except access to a computer and the digital literacy to be able to upload images of products (Luckman 2013). On these platforms authenticity is forefronted as crafts practitioners set up their own page and online personal profile. The stories around the product can now be told and there is a transparency surrounding the product, the materials used and the labour practices involved to get the artefact to market. The original artefact has become a desirable aesthetic, previously disparaged women’s craft practices have once again gained credibility and popularity. Virtual communities emerge as empowering spaces which challenge previous gender based classifications of craft as inferior to other creative outlets or merely as a hobby outside of commercial economies. Consumers of these products also feel that they have contributed in some way to a more ethical

way of consuming by purchasing directly from the producer and being able to make informed decisions regarding their purchases. Norton (2014) explores notions of authenticity associated with the “handmade” as it carries with it values based on skill and the time invested to execute each artefact.

Craft has traditionally been taught through doing and the apprentice learnt from a master through observation and making over a period of time. As craft practitioners are moving out of rural environments into cities, and many craft practitioners work independently, Bonanni and Parkes (2010) describe these online communities as virtual guilds. This recalls the apprenticeship model, but now the learning takes place online, facilitated by open access platforms. Craft practitioners meet in online communities where peer to peer exchanges take place. In these often gendered spaces crafters swap information and knowledge but they also swap stories and the online craft community also becomes a support mechanism.

The feeling of wellbeing and connectedness which comes from community is well known and authors describe this emotional aspect in their research (Bean and Rosner 2012; Zoran 2013; Norton 2014; Townsend & Niedderer 2016). Whether craft is seen to embody history, culture and memory through traces of location, time and place, or it is a means to express the pleasure of making and happiness in our daily work there is an intimate connection with the material artefact.

Authenticity

Authenticity as rooted in ideological values. What may be authentic to one group may not be considered so by another. In online craft communities, authenticity lies not only in craft as an activity but also in craft as a way of life. Notions of authenticity attributed to the qualities of handmade craft become less clear when digital manufacturing processes are employed. It is no longer obvious how something has been made and what it has been made from (Woolley & Niedderer 2016). Loh, Burry and Wagenfeld (2016) suggest that with digital manufacturing, “the authenticity of craft lies within the deeper structure of the practice: a workflow developed over a period of time”. With continued repetition, the tools, materials and technique used become a unique “repertoire” which in itself is authentic. Here we see a shift of focus from concept to process.

As craft practice becomes more collaborative and participatory, Kettley (2016) presents three frameworks for authenticity in contemporary craft practice that can respond to these collaborative, digitally mediated practices. Based on a relational ontology rather than the traditional notions of tacit “Romantic” and explicit “Enlightenment” views of authenticity, these frameworks take into account individual, societal and ecological authenticity in a non hierarchical relational ontology.

Craft culture and heritage

Continuity of skill is often connected to intangible cultural heritage and can be viewed as vulnerable in a globalised world. Threats include access to funds for operational costs, access to markets and a lack of recognition. Niedderer and Townsend (2015) question the importance of the survival of a craft if it is no longer practical or appropriate? In mitigation of challenges faced by craft practitioners in globalised economies, Niedderer and Townsend (2015) call for resilient approaches, meaning that craft has to adapt.

Blundel and Smith (2013) note that over extended periods of time, craft practitioners are resourceful and resilient and effect small transformations and innovations in response to changes in material availability or process or technologies, these may not always be noticeable but over time the craft develops and techniques and materials change to suit society. Just as design reflects the times, in this way so does craft.

In South Africa and in South American countries such as Chile, Brazil and Peru governments see craft as an economic and cultural activity, usually handmade using locally available materials and therefore representative of a specific place. This situatedness has lent itself to the craft sector catering for tourist markets. In the context of fast changing globalised economies one could question the sustainability and relevance of these practices aimed at job creation.

In mitigation of dying skills T. Vilbrandt, C. Vilbrandt, G. Pasco, Stamm and A. Pasko (2011) suggest using digital fabrication with open source software to recreate traditional crafts, which can then be displayed as virtual models or used to produce three dimensional physical artefacts on demand. They argue that they are preserving tradition and introducing it to a wider, new audience. This raises questions regarding authenticity and the connection to material and technique and skill traditionally associated with craft (Sennet 2008), yet this technology could be used as an interactive way for the public to engage with historic artefacts and therefore act as a record of past culture and heritage.

Myzelev (2016) considers that once artefacts are represented in the digital media, for example in an online exhibition such as those curated by museums, their authenticity becomes irrelevant. Once an object is digitised its qualities of physicality are lost but are replaced with an understanding of its production and an ability to disseminate this information. Myzelev (2016) suggests that the change undergone by an object when digitised becomes more important than the object's authentic provenance or original use. Digitally curated exhibits can foreground the hybridity of contemporary craft. In this context curation becomes important and the ability to document the narrative pertaining to the history and changing context of the artefact is foregrounded. These narratives engage users and could foster participation from interested viewers.

As a response to the threats faced by some craft practitioners, various authors put forward proposals based on collaborative multidisciplinary practices as means to support rural craft practitioners. Padovani and Wittaker (2015) suggest that the maintenance of local knowledge and enhancement of traditional skills can contribute to sustainable business. Through collaboration, the value of social capital and the benefits of using local networks can be benefited from. The typically high end products generated through these collaborations allow the consumer to make choices regarding provenance of the article purchased, in this instance, the narrative supporting the article becomes an important factor. The three following global examples describe successful interventions of this nature:

In India, a network of easily accessible resource centres serve as repositories for physical artefacts as well as digital archives of embroidery and needlecraft; providing an interesting approach to curating archives and preserving and disseminating knowledge. Fashion designers and crafts practitioners access these and connections for collaborations are made through these platforms. Kumar and Dutta (2009) describe a symbiotic relationship in which traditional craft brings originality and authenticity to fashion designers' work, and the designer brings sustainability to the rural craft practitioner.

A project implemented in Western Australia to build capacity in the craft and design sector was based on cluster theory. The project focussed on foundational design skills, processes from concept to production and business skills. Challenges were also identified with regard to craft practitioners accessing capital for growth and the capacity to build networks in order to sustain growth (Lommerse, Eggleston & Brankovic 2011).

Herrera (2016) describes a successful intervention to present local origin to global markets in Brazil where artisanal craft holds strong cultural capital. By keeping to traditional materials, they were able to produce original innovative work, restore identity and maintain cultural tradition whilst embracing technology scripting and digital fabrication methods.

Whilst online platforms offer ease of access to global markets, in rural and underdeveloped communities access to technology and the digital literacies to be able engage on these platforms is still limited (Herrera 2016). In these communities traditional craft forms are still practiced as a means to earn sufficient income to survive. Herrera notes that in Brazil craft offers a means with which to cope with adverse conditions. This holds true in many South African rural communities.

Ethics

An advantage of these collaborations is the continuity of craft skills albeit in new and updated ways. This has shown to be effective in mitigation of changing consumer trends by progressing craft in innovative ways in response to tastes of consumers. The disadvantages of these collaborations lie in the lack of frameworks for co-creation and the long term benefits for producers and designers. Collaborations between differently resourced participants raises questions about intellectual property and ownership of the work both for the maker and the designer. Sometimes these relationships can be “felt to be unstable, precarious, and even exploitive work” (Luckman 2013).

Murray (2010) also raises questions of equity and risk, by exploring the collaborative relationships between designers and craft practitioners a case is made for creative partnerships based on equity. Research undertaken in Istanbul showed craft / design collaboration to be beneficial if based on a blend of practical exchange of knowledge and experience and resources. Kaya and Yagis (2011) recommend obtaining clarity regarding responsibilities for respective scope of work upfront. The authors note that in some instances new ways of communicating design ideas needed to be found and negotiated, thus forming new hybrid craft / design practices. Success therefore relies on negotiation, problem solving skills and respective responsibility for scope of work, leaving no room for marginalisation of either party.

New modes of production also bring into question ethics and empathetic practice in reimagining sustainable post-Fordist, post-consumer economies. In such economies, products are no longer designed as finished articles but are constantly being improved upon and updated with each intervention or innovation cycle. Products are no longer only made by manufacturers for mass consumption but can be designed and produced to varying degrees by the consumer, in which case the intellectual property is therefore no longer owned by a single entity.

Practice

Authors describing the role of technology in their own practice, integrate technology to varying degrees. The following examples vary from using technology as an aid to using technology to replace the handmade. In the first instance technology supports the creative process but emphasis

is still placed on the hand crafted aspect of the final product, informing the perceived emotional content of the artefact (Treadaway 2007; Cheatle & Jackson 2015). In the work of Zoran (2013) and Zoran and Buechley (2013) there is a merging of digital fabrication with traditional craft within one artefact, resulting in a hybrid assemblage which acknowledges the passing of time. The merged digital fabrication onto and with traditional objects respects both and the resultant transformed object is loaded with meaning. Devendorf and Ryokai (2015) also consider hybrid (physical / digital fabrication) as a means to consider alternative everyday materials as part of fabrication activity. The last example, hinges around a new aesthetic that emerges from digitally mediated manufacturing which would not otherwise be possible using traditional methods and materials. Digital technology therefore is seen to augment creative possibilities, as there are no moulds, no two objects ever have to be the same (Eden 2012; Harris 2012).

Conclusion

In response to the question posed at the beginning of this article, the discussions predominating in the literature include: the democratisation of craft and design through online communities, the integration of technology with traditional practice, the role of technology in relation to authenticity and innovation, responses to concerns regarding sustainable production of consumer goods, collaborations and the ethical concerns aligned therewith and the theories that underpin these narratives.

Although some communities currently remain outside or on the edge of digitally mediated technologies, the pace of change and increasing access to digital devices is set to rapidly increase rhizomatically, facilitating access to new economic models and other creative possibilities. Technology as an enabler of access to information and markets and manufacturing has blurred the boundaries between design and craft and offers opportunities for collaborations and connections, localised solutions and more sustainable practices. Ethical concerns emerge regarding authorship and equity in collaborative practices. Alternative economic models are also required; if design is in the public domain, how does income generation take place on a day to day basis?

All of these practices are underpinned by an ontological shift towards process ontologies and rhizomatic structures which express a distancing from the modern capitalist paradigm to more resourceful and resilient alternatives underpinned by ethical practices (Carr & Gibson 2016). In the field of Human Computer Interaction, Wiberg proposes reframing the current material turn so that the emphasis is not on the computer but on the materiality of the interaction. The interaction of designer and computer as material. “The computer is dead. Long live the interaction!” (Wiberg 2016).

Recommendations for further research

Although there are compilations of academic publications in the field of craft (Adamson 2010) and in the field of Design Studies (Clark and Brody 2009, 2013, 2014) this review has focussed on the impact of digital technology in these areas. The progress of the discourse in this field is varied and well represented by authors publishing in Design, Craft and Human Computer Interaction journals.

South Africa has a rich and diverse craft sector, showcased in exhibitions, such as Collective Craft held in Cape Town and Johannesburg, and in well documented publications

(Coetsee 2015) yet none of the literature searches in academic databases resulted in local content. It is our opinion that there is therefore room for academic publication in this field.

Opportunities exist for transdisciplinary collaborations between designers and students of design and craft practitioners as catalysts for experimentation with materials, processes and technologies. The literature indicates that frameworks are required for ethical collaborations and empathic research practices, especially between differently resourced participants. Local replication studies could be undertaken based on interventions to support craft enterprises in the form of “virtual guilds”, open source marketing platforms and virtual repositories for the preservation of culture and identity. The question of appropriate curation and the authority of large institutions versus bottom up approaches should be raised. More work could be done on alternative sustainable economic models in support of craft practitioners in South Africa. Lastly, there is always scope in the creative industries for disseminating practice-led research initiatives showcasing local new technologies and practice.

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