Building networks for knowledge exchange, and design strategies for climate futures.

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Abstract: This paper examines the role of a research network that involves design schools and researchers from a wide variety of disciplines. The C-SAN Futures network addressed the role that global exchanges within design education and research networks can play in addressing challenges related to climate change. The network organized researcher and student exchanges, events, collaboration with local communities and the building of a digital platform to support knowledge exchange and communication. Through these actions, the network highlights the importance of a new kind of dialogue and new approaches to design research and education that underline possible futures and an approach to sustainability based on an understanding humanity as a holistic ecology. The paper shows how the network has played a key role in meaningful exchanges between design students and teachers, and given participants access to new experiences, perspectives and strategies for addressing climate change, sustainability and resource dilemmas.

Keywords: Networks, Climate Change, Design, Pedagogies, Contexts, Interdisciplinary

1. Introduction

1.1 Introduction

Design is increasingly being called upon to contribute in addressing major problems related to the environment and sustainability. This underlines an increased need for collaborations between designers and other researchers and practitioners from different disciplines. Design is producing multiple effects in complex systems often with both foreseen and unforeseen consequences (Bærenholdt et al. 2010). As design research becomes more interdisciplinary, researchers and practitioners are relying more on cross-disciplinary networks to develop strong, intellectually diverse collaborations to address complex problems, especially sustainability. Transdisciplinary research...
collaboration is increasingly taken up in projects dealing with climate change mitigation and adaptation (Gaziulusoy et al. 2015).

This paper examines the role of a design education and research network concerning four countries that involves design schools in Oslo, Cape Town, Changsha, and Nairobi. The research project under which this research network was created is called C-SAN Futures, and it brings together interdisciplinary group of researchers from a wide variety of disciplines. C-SAN Futures addresses the role that global exchanges within design education and research networks can play in addressing challenges related to climate change (O’Brien 2013), and environmental sustainability (Wood 2007). Activities of the network include researcher and student exchanges, research and design networking events, collaboration with local communities and the building of a digital platform to support knowledge exchange and communication.

The paper points to these activities to argue for the importance of a new kind of distributed design dialogue and new perspectives on design research and education that underline possible futures beyond just the next product release or promotion of the latest tool. Our overall approach to sustainability is based on understanding humanity within a holistic ecology and the idea that design has a dynamic and prospective role in shaping future ‘environments’. Further, we see that adopting such a view on design, and drawing on experience and theory, is a fruitful way of adding new knowledge to existing foresight perspectives (e.g. Nelson 2010) that feature in Futures Studies. We suggest that Futures Studies is a domain that needs to more fully incorporate insights, practices and analyses from design.

1.2 Intentions

By building a network of design schools centred on knowledge exchange and design strategies for climate futures, we aimed to develop a robust, sustainable, accessible, lean and dynamic participatory resource suited to and serviced by its contributors (Carr & Barlow-Zambodla 2012). Empirically, through analysis and reference to situated examples, the paper shows how the network has played a key role in meaningful exchanges between design students, teachers, and researchers in Norway, South Africa, Kenya, and China. The network has given participants access to new experiences, perspectives and strategies for addressing climate change, sustainability and resource dilemmas. The network also highlights the need for innovate ways of gathering, aggregating and communicating present and future initiatives, adaptive strategies, research, and pedagogies between different design communities around the globe.

2. Perspectives

2.1 Design and sustainable futures

Designing for sustainable futures is becoming a central feature of design research and practice as reactions to climate change, resource dilemmas and environmental health are widening to include designers, architects, and urban planners (Holm et al., 2010). Research on sustainable design, often drawing on normative approaches, has examined the role of “more sustainable” artifacts and systems, but also the design of sustainable social practices – how designed artifacts and systems can shape collective behaviours and practices (Stegall, 2006). Research on design for sustainability has also drawn on the notion of affordance (Norman, 1999) to highlight the fact that artifacts and systems can be designed to embody sustainable values and ways of living. Designing in a context of sustainability and climate change calls for a change in design practices in terms of new visions,
changed skills, new ecological literacies, and self-reflexive relationships between designers, users and society (Stegall, 2006).

Holm and colleagues (2010) observe that design takes place in already integrated structures of products, practices, cultures and structures of production that have a high degree of path dependency. Thus they argue that sustainable design in such a context becomes a question of how to conceive of new design approaches that change current (unsustainable) sociotechnical systems and regimes. This becomes a project of design as macro-level processes of regime transformation and the configuration of alternative design spaces.

Similarly, studies on innovation and sustainable transition conceive of sustainable design as consisting of nested efforts among a complex web of actors for achieving sustainable ways of living (Elzen et al., 2004; Kemp & Loorbach, 2007, cited in Holm et al., 2010). They emphasize on the need for design practices to go beyond existing knowledge systems embedded in fixed systems of practice, such as is argued in the Systems Oriented Design conferences and publications (e.g. Sevaldson & Ryan, 2014; Jones, 2014).

These authors in general see the need for the development of alternative paradigms and practices in alternative design spaces, where design is highly implicated in the configuration of such spaces. In academic and societal discourse on sustainable development, global challenges such as climate change, food insecurity, and biodiversity loss are framed as wicked problems (Dentoni & Bitzer, 2014; Levin et al., 2012).

2.2 Networks and interdisciplinary collaborations

In order to conceptualize the role of design networks in addressing environmental and sustainability issues, we draw on the substantial and growing body of literature. Henry and Vollan (2014:584) define a network as “a set of vertices (also known as agents, actors, or nodes) connected through a set of links (also known as ties or edges). This highlights the relationships that link together social agents such as academic researchers, organizations, policy actors, resource users and members of the general public. They suggest that depending on the manner in which these vertices and links are defined, networks can provide unique insights into processes that are important for sustainability.

Research on networks is being situated within a context of global academic capitalism (Rhoades, 1997). In this regard, the process of developing and managing research networks is conceptualized for the purpose of optimizing the ability of researchers to publish research (see Lowrie & McKnight, 2004). Henry and Vollan (2014) argue that networks provide a useful organizing concept to help couple knowledge around sustainability problems with appropriate actions to address these problems.

First, the knowledge systems needed to address issues if sustainability are distributed across a range of actors and communities locally and globally. Second, the particular ways this knowledge is configured and shared have implications for the ability of actors and systems as a whole to generate new understanding of problems and potential solutions.

There is a substantial body on literature on networks in which they have been characterized either as social or organizational/industrial networks (Lowrie & McKnight, 2004). Here the importance of developing networks is underlined as a means of facilitating the sharing of information and the development of pertinent and relevant knowledge, and where those in the network reap rewards through the exchange mechanisms entailed and in emergence (DeBresson & Amesse, 1991).
There is a significant body of literature on social networks that focuses on networks as structures (Burt, 1992), where it is assumed that the structure of relations established will have a major impact on the outcomes of networks (Faust, 1994).

### 3. The project

C-SAN Futures addressed designerly strategies for scaling up climate change approaches in South Africa and Norway. It is part of network collaboration between the Centre for Design Research at the Oslo School of Architecture and Design and Design at the Faculty of Informatics and Design at Cape Peninsula University of Technology (CPUT). The research network was funded by the Norwegian Research Council’s South Africa - Norway Research Co-operation on Climate Change, the Environment and Clean Energy (SANCOOP) programme in conjunction with its South African partner the National Research Foundation (NRF). The project originated from a common interest between the two institutions in finding ways of developing designerly strategies that enable existing knowledge about our stressed climate system to be rapidly translated into methods and criteria that can make effective and relevant actions more probable.

First, the network aimed to develop pedagogical approaches and synergies on global scale across a variety of learning contexts. Second, the network aimed to develop communicative ecologies comprise of a series of multimodal devices for disseminating research, assembling relevant information, and designing discursive elements for persuasively communicating to different constituencies about key issues related to climate change, and subsequently spur alternative public discourses and research engagement about our common future. Third, the project aimed to build sustainable design ecologies for generating research by leveraging African and international networking opportunities to address issues of climate change and respond with solutions steeped in design wisdom in a meaningful and relevant way.

#### 3.1 Transformative pedagogies

Sisitka and colleagues (2015: 73) argue that:

> the nature of sustainability challenges currently at hand is such that dominant pedagogies and forms of learning the characterize higher education need to be reconsidered to enable students and staff to deal with accelerated change, increasing complexity, contested knowledge claims and inevitable uncertainty.

An essential part of the project’s actions involve the leveraging of joint resources and competences to develop a pedagogy that works at a massive scale. Pedagogical activities were considered as one of the ways in which to scale up the knowledge base on climate change. One of the ways of enacting this pedagogy is through what we called a CC-MOOC (Climate Change- Massive Open Online Courses) trial programme, where different design schools may contribute different modules and content. The project envisaged the use of the MOOC format as a means of making available a series of common resources for students in Oslo, Cape Town, and all the other institutions elsewhere that were connected to the network. The MOOCs were envisaged to engender massive participation giving participants access to support from other students from other countries, and to resources provided by these students in the forms of discussion, links a diverse range of cultural perspectives (see e.g., Ferguson & Sharples, 2014, for a discussion on the advantages of MOOCs). The courses and modules in the MOOCs can be used to develop tools and resources for use in other contexts, such as to inform professional practice. These are being trialled first through the establishment of an African Design Schools Network as a means to connect resources and participation under the banner of the international design association XID and not formally as course-driven MOOCS.
Besides these digitally mediated networks, C-SAN Futures also set out to increase student exchanges, where students would be offered opportunities to attend courses offered in the different universities that are part of the network.

3.2 Research contexts

We are working towards producing a body of research that marks out our collaborative strengths but also our diverse professional and academic perspectives with the concomitant potential for further practice-based inquiry that addresses matters of context, diversity, access, community and communication.

Through research carried out within the context of the network we have also explored a Foresight methodology that utilizes design tools in order to develop future scenarios that can be back-casted to present time and become what we above coined ‘Discursive Elements’ for public creative democratic discourses (Edeholt, 2012). In these scenarios, social patterns, ways of living and possible technical solutions are intermixed in ways that open up for a public dialogue about new approaches to live and prosper. The technologies explored and the subsequent solutions are therefore not primarily evaluated for their direct feasibility, but much more for their discursive qualities. This includes, for example, the ability to create vivid, creative and politically dynamic opportunities for real and radical change. Climate futures implicate us all, as citizens, educators, designers and researchers. Design needs to define its roles and actions while they may have some effect and can be extended as resources for the communities it serves. Building networks is a crucial part of strengthening connections, maintaining knowledge exchanges and supporting the practices of sustainable design futures in the context of climate change.

3.3 Cultural synergies

Working in different contexts, the project has developed a series of activities to support collaborative interdisciplinary research and pedagogic approaches concerning climate change and sustainability.

One example of such activities was a mini project where a group of students, teachers, and researchers from the Cape Peninsular University of Technology and the Oslo School of Architecture and Design went on a journey from Cape Town to Windhoek to understand the experiences of local farming communities about the effects of climate change. During the journey across these communities, students, teachers, researchers and local community members came together to collaborate, reflect and share understandings and observations on themes varying from the dwindling of fauna and flora, to portable water. From these encounter with local communities, the project team generated “stories” of climate change that were showcased on the body of an interactive instillation piece, a tiger fish named “Fiscilla”, and exhibited at the 13th Participatory Design Conference in Windhoek and the Afrika Burn festival in the Tankwa Karoo (Snaddon et al., 2017 in press; Morrison & Chisin, 2017).

In another example, the network connected students to a course at the Institute of Design at AHO called ProtoHype. ProtoHype is a master’s level course in Industrial Design that builds on a pedagogy centered on approaches to design solutions that would eliminate dependence on non-sustainable products and by-products of the current dispensation. The designed solutions developed through the course’s pedagogy are informed by an increased awareness of the environment from situated local perspectives. The course was designed to look at design as a tool for creating lasting and even generationally passed on solutions to solve problems using systems thinking, long-term thinking, multi-disciplinary interactions, collaboration and ethical values. As part of the course, students were taken on a trip to Nairobi in Kenya. The class usually consists of international students from countries...
such as France, Iran, China, South Africa and Kenya. A few students that attended the course have described their learning experiences in a paper that they wrote and presented at the CUMULUS 2016 Conference in Hong Kong. In the paper they state the following:

As students in the ProtoHype project, we have experienced this movement and we acknowledge it for allowing us to generate contextual knowledge through engaging with transdisciplinary actors from respective geographical, interdisciplinary and socio-cultural settings. This gave us as primary access to local and indigenous knowledge through dialogue. As opposed to forward looking and anticipating for future alternatives, these dialogues delved into the ability to back cast into the past of cultures, contexts, tools, and prototypes. The ability to back cast while moving through ... is what we acknowledge as contributing to long-term sustainable options. This rear-view mirror approach to design practice within the situated learning spaces nurtured the ability for us as students to reignite traditional prototyping tools, such as indigenous material selections, manufacturing techniques and the cultural settings of prototypes over time (Opoku-Asare et al., 2016).

The students argued that “transposing” students from traditional learning environments into different learning contexts gave them useful tools for foresighting and design thinking towards futures thinking and futures oriented design. This, they suggested, could help them conceive of and reach for alternate futures by shaping the long-term sustainable options for local contexts and cultural settings. It required a vantage point from which they could see into the possible and plausible alternate futures, and help them as master’s students and as parties to wider research projects in design, climate change and sustainability, to think about how link anticipation strategies and design foresight.

The activities in the course were constitutive parts of a pedagogy that helped students develop habits of critical reflection centered on actively considering values, power, positionality, and agency (see Snaddon et al. 2017 in press). Sisitka and colleagues (2015) argue that in order to transform for the “sustainability turn” people everywhere need to learn how to cross disciplinary boundaries, expand epistemological horizons, transgress research and educational frameworks, challenge hegemonic powers, and transcend mono-cultural practices. Such adjustment is needed in order to create new forms of human activity and social systems. This, the authors suggest, would require an integration of pedagogic, research and community engagement processes into forms of learning that allow for the emergence of agency and lived experience in transformative praxis contexts.

4. Conclusion

This paper has examined the role of research networks in generating research and pedagogical synergies within design using the C-San Futures project as it’s main focus. The paper has tried to show how the network has played a key role in meaningful exchanges between design students, teachers, and researchers in different research and learning contexts. The network has given participants access to new experiences, perspectives and strategies for addressing climate change, sustainability. The outlines we have presented in this paper only constitutes part of the overall actions and visions of the project.

What the different activities seek to highlight is the desire to develop designerly strategies that enable existing knowledge about our stressed climate system to be rapidly translated into methods and criteria that can make effective and relevant actions more probable. The vision, to be achieved through research and pedagogy, is to seek to efficient ways to address, build content and
disseminate sustainability issues to and with design students on a global scale across a variety of learning contexts and subsequently spur alternative public discourses and research engagement about common futures.

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