Challenges and Opportunities of Cross-Disciplinary Design Education and Research

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Introduction

Design is undergoing a transition from an 'arts and crafts' type of discipline to an academic field of 'theory and research', and the need for a different model of design education and research is becoming ever more important. So far, design has been seen as a field of practice and applied research, but design can also be a field of thinking and 'blue sky' research. However, in order for designers to be accepted as researchers by other disciplines, design education needs to be revisited and some cross-disciplinary research methods need to be introduced early in design education. Within the industry, design is already perceived as an integrative discipline involving the interaction of several other fields; but more needs to be done in order for design to be fully accepted as such by the wider academic community as well (Muratovski, 2011).

Design as a field requires a keen understanding of people, cultures and belief systems and not only production techniques, material properties and technical skills. This way of thinking, however, is often unknown and incomprehensible to many undergraduate designers, and even to some designers with masters degrees (Ireland, 2003, p. 22). The situation changes when it comes to the field of design research at a doctoral level, but in order to get to that level designers engaged in research need to develop a comprehensive understanding of a wide plethora of research methods capable of transcending disciplines. In line with this, Hanington argues that an integrated approach to research methods is necessary for the conduct of credible research (in other words, research that can be recognised by other disciplines as well). Therefore, integrative research methods should be explored and evaluated for effective translation to design education (Hanington, 2010, pp. 25–26).

Following the same path, Zimmerman argues that this is a problem within the higher education design curricula where design research is rarely included as a set of skills with a high strategic value. According to him, while design research may come in many forms (e.g. quantitative market research, personal interviews, experimental design analysis, qualitative research, and so on) it also represents a willingness to look beyond the basic concern of 'crafting' a project, and openness to bringing new insights into the design process itself (Zimmerman, 2003).

On the other hand, Buchanan raises the issue that such developments in the design field may appear frightening to some design practitioners and design educators, as well as to academics from other fields. But he believes that in time they will learn that design, when properly studied, can provide a 'powerful connective link' with many bodies of knowledge (Buchanan, 1998). In addition to this it can be argued that, as design

already integrates knowledge from many other disciplines and puts this knowledge into practice, there is no reason why design researchers should not reposition themselves as 'facilitators' who can bridge the cross-disciplinary gap in their pursuit of new knowledge (Muratovski, 2011, p. 2). However, it has to be understood that the introduction of cross-disciplinary design education and research is a long-term process, and the relevant skills have to be taught gradually at different stages of the education of design students.

Challenges and Opportunities

To plan a cross-disciplinary education and research model in design education, we can look to the health sector for guidance. Aagaard-Hansen, while analysing the interface between biomedical/natural science and applied medical anthropology, has identified a series of interrelated research challenges and opportunities that we can identify within the field of cross-disciplinary design research as well. According to him, there are two key motives behind cross-disciplinary research: the first being the pursuit of results that can be applied in practice, and the second being the development of original, overarching research questions that require an exchange of methods followed by new conceptual frameworks (Aagaard-Hansen, 2007).

According to Aagaard-Hansen and Ouma, cross-disciplinarity is a process in which a research group gradually moves in the direction of integration – from multi- to transdisciplinarity – and this can be introduced at various stages (Aagaard-Hansen and Ouma, 2002). If this concept is introduced in design education, starting from an undergraduate level and then progressing to a postgraduate level, then by the time of doctoral graduation design graduates will have developed a high level of cross-disciplinary skills that will enable them not only to generate new knowledge within the field of design, but also to lead research teams consisting of narrowly specialised experts from diverse disciplines (Muratovski, 2011, p. 5).

According to Rosenfield, this concept can be introduced on three levels. On the first level, multidisciplinary researchers work from their discipline-specific bases to address common problems while forming or following a logical order or sequence. On the second level, interdisciplinary researchers use a combination of study designs and methodologies throughout various stages of the research process. On the third level, transdisciplinary researchers work together using a shared conceptual framework drawing together discipline-specific theories, concepts and approaches while addressing common problems (Rosenfield, 1992).

Based on this taxonomy, the following points can be argued:
- The multidisciplinary model can be applied to undergraduate studies in design since it provides an introduction to other disciplines.
- The interdisciplinary model can be applied to masters students, as it attempts to integrate or synthesise perspectives from several disciplines, and this can be seen as a step further in the evolution of the field itself.
- The transdisciplinary model, which involves a 'transgression' or 'transcendence' of disciplinary norms, can be applied at the doctoral level, since this model of education leads to a 'fusion of disciplines'

which in return can lead to introduction of new knowledge to the field of design (Lawrence and Després, 2004).

While there are benefits in the introduction of cross-disciplinary education and research to the field of design, it has to be mentioned that there are also significant difficulties in the establishment of this model – the main challenge being that cross-disciplinarity is difficult to operationalise (Muratovski 2011, p. 5). As a result of that, Aagaard-Hansen in his paper 'The Challenges of Cross-disciplinary Research' (2007) outlines several potential conflicts that may arise in this type of research.

While Aagaard-Hansen's study examines the cross-disciplinary research conflicts from the perspective of health sciences, I will argue that design researchers can experience the same conflicts as well. In the first instance, design researchers may have identical problems establishing collaboration with other researchers due to lack of knowledge of other disciplines, divergent standards, different methodological approaches, or simply due to negative attitudes and prejudices that are present among the disciplines. Some of the potential challenges are as follows:

a) *Research methods:* Researchers accustomed to working within particular discourses can find it rather difficult to come to terms with alternative approaches. The difference in data collection methods is usually the first and the most obvious issue that is raised. One research concentration may consider 'their' method to be the only appropriate way of representing 'reality'. The most obvious conflict here is the one between quantitative and qualitative methods. Therefore, in the process of establishing a cross-disciplinary team it becomes necessary for the team to reach an initial, common understanding that the data collection method needs to be derived from the character of the research question, and not on the basis of individual preferences. In an ideal situation, the preferable outcome is the use of combined data collection methods.

b) *Open vs. closed approach:* The choice between the types of research approaches can be seen as another obstacle in the process. For example, if the aim of the research is to end up with a concise figure describing a certain occurrence such as a combination of variables, then a closed approach is needed. If, on the other hand, the aim is obtaining a balanced picture of a phenomenon as an individual or a group of people may experience it, then a more open approach is more suitable. In this case, it needs to be clear that both approaches can be appropriate – a closed approach when exploring tangible, quantified correlations between different variables, and an open approach when the main aim is the provision of a multi-faceted and overarching description of the new field. The first is necessarily based on the researchers' preconceived categorisation, while the second is trying to avoid exactly that by allowing the categories that emerge from the data. The challenge is agreeing what approach is more suitable for the research project.

c) *Prejudices:* Designers, similarly to anthropologists, function as their own 'data collection instruments' and when it comes to introducing changes in the research process they allow themselves a great

degree of freedom. This often causes distrust from the researchers that apply controlled, quantifiable research methods, and they are reluctant to accept the objectivity of the data produced in any other way. The key issue here is that they find it difficult to draw a line between the findings and the researcher's personal opinions. The very same position causes scepticism in the eyes of the qualitative researchers as well, as they acknowledge subjectivity as a basic precondition for research. The major challenge that designers have to face in the cross-disciplinary collaboration is finding a way to bring a level of subjectivity to an otherwise clinical form of research.

d) *Research question:* Different disciplines deal with research questions in a different way. Some may approach their area of interest from a causal perspective, while others may find descriptive research more appropriate. For example, designers might conduct theoretical research into what kind of emotional impact can be achieved if a certain colour is used for the packaging of a particular product, while marketers might assemble focus groups or surveys to determine what colour will have the most impact if used in the packaging design of a particular product. While both designers and marketers might have the same agenda, such as to determine what colour should be used for the packaging of a particular product, they will have very different ways of dealing with their research question and may disagree with each other's findings.

The list of challenges is long, but most of them are related to divergent methods and methodologies. Other issues can range from the terminological (the body of terms used within one field to deal with a particular subject of study may be different to another field), to conflicting evaluation procedures (cross-disciplinary research is difficult to evaluate by peers that work in a mono-disciplinary manner), and problems of publishing research (finding a scholarly publisher that is interested in cross-disciplinary research is not an easy task). Due to its complex nature, the management of cross-disciplinary research is another challenge. Research, like many things in life, is influenced by power and status and research projects can often create a clash between academics, or between disciplines. Traditionally, either because of access to funds or by virtue of status, some disciplines have been perceived as being more 'powerful' than others. The question of 'who decides what to study' within a cross-disciplinary research team is often propped up by attitudes rather than reason. Negotiating this balance is one of the most difficult tasks that research managers or principal investigators face.

Then again, even though there are quite a few challenges in developing cross-disciplinary research, the benefits can be highly rewarding in terms of delivering a new body of knowledge. Many of the potential challenges can be resolved by applying some practical solutions. The first step, according to Aagaard-Hansen, is for cross-disciplinary researchers to obtain 'mutual knowledge' about each other's disciplines. A broad understanding of different methodologies and theories, as well as epistemological and historical aspects of various disciplinary discourses, is essential for understanding and respecting the position of other disciplines. Conceptual compatibility is the next step and this should be seen as the basis for understanding, overcoming negative prejudices and creating respect (Aagaard-Hansen, 2007, pp. 431–432).

Conclusion

In spite of the complexity associated with this type of education and research, there is a need for more researchers with diverse backgrounds to enter the cross-disciplinary research field. The challenges and the opportunities outlined above, even though presented in a simplified and polarised form, identify the necessity for relevant and innovative cross-disciplinary research.

Educating designers to be able to address the twenty-first century problems related to globalisation, overpopulation, overconsumption, terrorism and climate change requires more than teaching creative thinking and applied research. These problems require an advanced theoretical and cognitive model of education that brings divergent research methodologies, theories and findings together that cannot be taught within the 'traditional' model of design education, and that is why a new model of cross-disciplinary design education is needed.

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