THE FUTURE OF DESIGN: UNFRAMED PROBLEM SOLVING IN DESIGN EDUCATION

Silje Alberthe Kamille FRIIS[1], Anne Katrine Götzsche GELTING[2]
[1]Design School Kolding
[2]Independant Scholar

ABSTRACT
The present paper sets out to investigate the impact and significance of a 3rd semester course in design methods, complex problem solving, and cross-disciplinary collaboration to the students within six design disciplines as experienced by the students three years later. The course reflects a shift in focus from a design practice framed by outcome to open-ended problem solving.
Data shows that some students draw a direct line between the course and later success, for instance in obtaining an internship, whereas others find it of little use and relevance to later practice. Existing design research and theory is applied to further understand how to motivate design students to engage in an expanded field of design practice.
Findings indicate that students need help to disengage from identifying with a particular design discipline if they are to engage in complex problem solving with an open mindset. This might be achieved in part by the design school changing the names of individual design disciplines to prevent predetermined outcomes. Also, students might be more willing to experience and apply new approaches if they are included in discussions about contextual factors such as transitions in economy, society, and technology influencing the future disciplines and practices of design and thus the professional roles that they themselves might take.

Keywords: Design research, cross-disciplinary collaboration, design education, design disciplines, expanding design field.

1 INTRODUCTION

The field of design practice is constantly changing [1] and is particularly susceptible to transformations in technology and in the economy, as illustrated in the rapid decline of traditional design professions during the recession in 2007 – 2008 [2]. While most economists and politicians continue to advocate and think in terms of how to achieve growth via for instance increased productivity and new technological advances, an increasing amount of people point to signs of large-scale transformation being underway [3]. Many economists and natural scientists argue that the era of mass consumption has come to an end due to a scarcity of resources [4], and that this will force forward non-material consumerism [5].

In light of these developments, the space of possibilities for design disciplines will likely change significantly in the coming years. Traditional areas of design cannot be taken for granted, and it seems wise to look for new target areas. As a reflection of this change, the multidisciplinary Design Methods (DM) course has since 2010 been part of the curriculum for 3rd semester design students at Design School Kolding (DK). The focus is on unframed problem solving teaching the students how to navigate complex situations by applying design research methods; communicating methods and process to others; reflecting on individual preferences in design work and teamwork and knowing how to collaborate in cross-disciplinary teams. The course is experience-based, and students work in teams on 'real' challenges.

The DM course is in line with current developments in the field of design, in particular 'design thinking' as advocated by professional design firms and taught in many design schools [6]. Design thinking has been defined as a strategy and a toolbox*"[…] for addressing the complex and open-ended challenges faced by contemporary organizations"* [7]. Some researchers stress the collaborative nature of design thinking addressing the need for collaborative, multidisciplinary approaches to design in education [8].

2   LAYOUT OF THE PAPER

The paper starts by describing the research method. Then follows a description of the DM course: the pedagogical approach, the learning objectives, and the theoretical foundation. Next follows the empirical data based on semi-structured interviews with 9th semester students leading to the question of how to motivate design students to engage in an expanded field of design practice. The question is addressed by applying existing design research and theory to further understand the implications and significance of design students' mindset to their engagement in open-ended problem solving. The analysis is followed by a short discussion of the future of design and design education opening to new research questions and the conclusion.

3   METHOD

The impact and significance of the DM course is investigated by interviewing participating students three years later when attending 9th semester. The main objective of the study is to understand and learn from students' responses [9] to produce concrete case knowledge by investigating a single example [10]. Data consists of semi-structured interviews with 12 students conducted by the author, who was also teaching the DM course. This might cause concern of bias. The interviewer has a "double insider" position [11] as a researcher and a teacher to the students. The position directly affects the interview where the 'researcher' might be looking for particular answers, and the students might provide these to the 'teacher'. The interviewer has tried to counter this by asking open, not value-laden questions and encouraging criticism. The double insider position has the advantage of the interviewer and interviewee sharing a common story and a close knowledge of the context, however, it is difficult to contest tacit knowledge or a given discourse [11].

The students were selected randomly but with an even number from each of the six disciplines. Since illustration, graphic design, and interaction design were merged into a single department, 'communication design', in 2013, this is how they are listed. Perspectives from the students have been extracted with regard to the objective of the study and are presented in section 5 Empirical Data.

4   THE DM COURSE: LAYOUT, PEDAGOGICAL APPROACH, THEORY, AND LEARNING OBJECTIVES

The DM course includes six different design disciplines, namely industrial design (ID), fashion design (FD), and textile design (TD), interaction design, illustration, and graphic design (CD) and runs for eight consecutive weeks. In 2012, approximately 70 students were part of the course, which was divided into three sections: two weeks of preparation, four weeks of working in a team, and two weeks of evaluation. The DM course builds on theory and practical approaches from applied creativity, design thinking, and innovation. The educational approach is further presented in articles by Friis [12]. During the first two weeks of the course, the students are introduced to approaches and theories of how to include diversity and collaborate in creative teamwork, foremost the creative problem solving profile by Basadur [13], the knowledge domain approach developed by Justesen [14], and how to build relationships in creative teamwork by Darsø [15]. During the four weeks of project work, student teams receive ongoing supervision and feedback and are introduced to and experience the design research methods presented in the DSKD Method Cards [16]. The DSKD Method Cards adhere to the 5C Model [17] consisting of five categories of design methods: *Collaborate,* focusing on methods for identifying differences and similarities in the team and making the teamwork work, *Collect,* providing methods for how to produce data about the situation, *Comprehend,* including methods for how to analyze the information and identify challenges, *Conceptualize,* providing methods for ideation and evaluation when working with possible solutions, and *Create,* crystallizing ideas in tangible ways, for instance by prototyping. The methods derive from multiple disciplines such as anthropology, business, design, engineering, and psychology and are collected to support investigative behaviour in creative, multidisciplinary teamwork. The final two weeks of the course focus on joint reflection on the process, harvesting insights, presenting work to each other, and course evaluation.

5   EMPIRICAL DATA

The interviews were semi-structured, posing open-ended questions: What stood out when thinking back? What did the students learn during the course? What do they find useful in their present practice as designers? In the following main points from the interviews are related.

5.1 What the Students Recall About the DM Course

The first thing every student mentions are the design methods themselves. The methods were useful (as part of the course), in some instances even indispensable to investigate what they experienced as complex situations. Says a CD student: *"It was a complicated topic but the methods provided an entrance point to the issues."* Students agree that the method cards provided them with a language for how to work together in the team. Says an FD student: *"The cards were tangible, concrete. [...] we used the methods to communicate with each other"*. However, several students express the experience of disappointment when the methods cards 'didn't work' e.g. solve a conflict or yield the desired results. Says a FD student *"It is not a quick fix. Sometimes you simply have to be present and listen to each other."*

The students think back on the DM course as 'hard', some even apply the term 'painful'. One ID student believes the pain was inevitable*: There were many first-time experiences. We had to identify the challenge, apply design research methods and work on 'real' world problems in teams. I feel that the confusion, being outside one's comfort zone, was a positive thing. There were so many annoyances. It is difficult to get to know this pain without experiencing it. But one can learn to handle it"*.

All students comment on the teamwork, which they found to be frustrating, but instructive. Several students state that it provided them with a new understanding of their own roles and competencies in creative teamwork. Says a CD student: *"I discovered I am good at observing, good at detecting patterns and looking for underlying dynamics, whereas one of the other team members is a natural extrovert, good at opening doors and asking questions. We made a good team"*. A TD student explains the richness of working with a student from FD and how this helped each of them expand their areas of competencies.

Several students explain how the course provided them with a new overview and understanding of the design process. Says a CD student: *" [...] a great understanding of the design process and how I can organize and structure it"*.

5.2 What the Students Take with Them from the DM Course

Student replies move in opposite directions when reflecting on how they apply learning from the DM course in their practice as designers. In general, FD and TD students do not think that the course was tailored to fit their needs. They find it was 'interesting' but largely 'not relevant to their discipline', however one TD student draws a line back to the course as she explains how illustration and communication design is part of her master project. She says that she would have liked to apply the methods even more, *"[...] but I tend to forget them"*. The FD students say that they do not apply the methods, the process, and the collaboration skills since they do not work in teams. *"I don't use the methods – I don't try to be conscious of what it is exactly that I am doing. Not all methods were meaningful in relation to my discipline' [...]. I use my intuition a lot. I think that is what the design discipline is about. Intuition is an extension of my personality"*.

In contrast, the ID and CD students express how the process model and the methods in the DM course are an integrated part of their practice: *"I use the methods every day – unconsciously. They are part of my identity as a designer"* (CD student). Says an ID student: *"An industrial designer has to work with other disciplines, which makes the model and the methods a damn good tool"*.

Some of the ID and CD students see the new vocabulary as a planning tool. A CD student compares the approaches taught in the DM course to the Norwegian design school where she is presently an exchange student: *"Here [...] it seems like they have never been given a tool to structure and map methods in their design process. I feel that I have a huge process overview in my backpack. It is worth gold"*. Others explain how they return to the methods for inspiration when they experience fruitless discussion in a team or are stuck: *"[...] then the box is on the table and can be used to decide how to move the project forward* (ID student). Others again comment on how the method and process language help explain to outsiders how designers work.

The ID students express how the DM course has been invaluable in relation to their work as interns in private corporations: *"The first interview at LEGO focused on my experience with collaboration, and I was able to tell about the teamwork in the Design Methods course: about the process, the hurdles that we overcame, and the roles that I took. Obviously, collaboration is very important to them. Once I was accepted at LEGO, I really needed my collaboration skills as I was placed in a team with seven other participants from China, the US and Europe, from different age groups and with different educational background"*.

6 COMPARING THE DATA TO THE LEARNING OBJECTIVES

The students from the six design disciplines agree that what stands out from the course are the design methods and the collaboration experience across disciplines. This is in line with the main learning objectives of the course. The students recall the notion of open-ended problems and how they navigated the complex situation by applying design methods. They explain how the method cards were used as a tool for dialogue and for negotiating a way forward. Most of them think of the cross-disciplinary teamwork as challenging but enriching to their understanding of their own competencies.

ID and CD students apply the methods in daily work. They think the course has added to their method and process knowledge and see this as an intricate part of their practice, individually and working with others. They draw direct parallels between the course and how they work today. They, together with one TD student, point to the continuous rewards of working with others who are different from oneself because one learns about one's competencies and roles – and is given the chance to expand one's competencies.

However, the FD and one TD student on one side and the ID and CD students on the other side differ when expressing the usefulness of the course to their practice. The FD students do not see the conscious application of design methods as relevant to their work. They refer to 'going on the inside', applying and trusting their own intuition in the process. Also, they haven't had any collaboration experiences, they say, in which learning from the course came in handy.

Obviously, we have not been able to frame the course in a way in which it is presented as meaningful and motivating to every student regardless of design discipline. How might we do this in the future? Existing research and theory is applied to help shed light on the new question.

7 UNFRAMED OR FRAMED PROBLEM SOLVING

Investigating design firms' ways of designing, Friis identifies and maps four different approaches [6]. The 'artful' and the 'scientific' approaches are two different ways of addressing unframed problem solving whereas the 'experience based' and the 'research based' approaches take place within the confines of a framed outcome. The DM course is in line with the 'scientific' approach, which is based on *"[...] continuous development of explicit methods and a common process language"*. It is a systematic and objective approach where *"the explicit methods and tools support collaboration"*. The 'experience-based' approach to designing is based on *"[...] implicit and intuitive methods [...] experience and individual talent"*. It is a subjective approach that supports *"alone work"*. The description fits with that of the students, who base their work on intuition and 'personality' preferring to work on their own to develop and hone individual expression and talent.

When presenting the model, Friis [6] explains how design firms might choose different approaches according to the situation at hand. However, what she neglects to say and what comes forth in the present study is that applying the type of designing that the situation requires is not as straight forward as it might seem. If the designer is identified with a particular approach and outcome, for instance 'implicit and intuitive methods' and 'unique vocabulary' in the experience-based approach, it is not possible to genuinely experience and carry out unframed problem solving. Referencing Scharmer, it takes an open mind, heart and will to fully engage in this level of transformation work [18]. With the realization that there are students who experience designing as an individual, intuitive process, and perceive design education to be about developing a unique, personal expression, it seems clear why the DM course is declared irrelevant, a distraction from 'real work', and is not included in subsequent design practice.

8 THE EXPANDED FIELD OF DESIGN

At present design is advocated as having a significant place in dealing with present and future complex problems in society and within organizations and industrial development [1]. The point is demonstrated by Dorst [19] who sees 'abduction' and 'frame creation' as central elements in design practice and illustrates how these approaches can be applied to handle open, complex, and dynamic problems in contemporary society. In this way, design practice spreads across society adopted and adapted to new situations beyond traditional areas of design. Yet, he is concerned that designers might be inhibited to do so: *"[...] experience has shown that often design practitioners seem to cling to aspects of the design professions that paradoxically limit their contribution to frame creation-type processes"*. He exemplifies with designers being 'over-eager' to define the solution space early in the

process, preventing them from staying open to different frames, and points explicitly to communication design, fashion design, and product design, "[…] *defined and named by the nature of their outcomes"*. Dorst's point is confirmed by a FD student: *"The design methods course would be much better for us if the focus was on fashion"*, indicating a mentality tuned into a particular solution space and thus unable to investigate the relationship between problems and solutions with a sufficiently open mind.

At a design school where five out of six design disciplines are named by their outcome (interaction design is the exception, and ID also slightly broader), it might be worth considering a change of terminology. For instance 'design for change', 'transition design', 'inclusive design', 'sustainable design', 'environmental design', 'social design', and so on. Names, which are less confined in relation to the solution space.

9   THE FUTURE OF DESIGN

Designing in an expanded field is a process that requires the designer to get up and out of the studio, Dorst says, to interact at a deep, personal level with the situation and the network of interested parties [19]. '*The bleakest scenario'*, he says, *'would be that while design is moving into the wide world, designers are left behind'* and points to the crossroads that many design schools find themselves at, educating within traditional areas of design while also trying to expand design practice to new target areas. The challenge is well illustrated in the vision expressed by the rector of DK in her newsletter October 2015: *"Design is increasingly about supporting people and communities in being creative. [...] This means [...] the main competence of tomorrow's designer is the ability to communicate; to express what it is he or she does"* [20]. Yet, several students express that the DM course takes time away from and distracts them from their professional focus.

If the employability in traditional areas of design were stable or expanding, this discussion would likely not be relevant. However, in the context of dramatic changes in the world's resources and economy, design in the expanded field might turn out to be just as important to the design discipline itself as it is to society: Transferring and expanding skill sets to encompass new target areas and refrain from educating students into blind alleys. Making this context visible to the students, including them in a discussion of how to adapt to large-scale transitions, might in itself support motivation among students to engage in the DM course.

10 CONCLUSION

Many design institutions find themselves at crossroads between traditional, outcome-focused design disciplines and design in an expanded field. Within the situation lies the question of the individual design student's perception of his or her professional identity. The present study indicates that student groups who see designing as a subjective process linked to personality and who focus on a career within a particular outcome-based design profession are not sufficiently open to dealing with unframed, complex design problems. While the work of Dorst [19], and many others, illustrate the *opportunities* for design in an expanded field – there might also be a *necessity* nested in the expansion to secure the design discipline a future life.

There is a new context that must be made visible to the students. Not as a fixed reality but as a transition to be explored, discussed, and acted upon. What is 'design in the expanded field' – not only in terms of the needs of organizations, society, and the world at large but also in terms of the future professional identities of designers? How might we make the transition in design education to make sure that there is a place for design in the future? How might we teach design students how to adapt to different types of challenges? Preparing design students and professionals, enabling them to make the transition into this immediate future, is one of the most pressing issues in design education.

REFERENCES

[1] Friedman K. and Yongqi, L. and Jin M. Editorial. *She ji,* 1, 2015, pp. 1-4.
[2] Grefe R. *How is AIGA helping designers survive the recession?* Available: http://www.aiga.org/how-is-aiga-helping-designers-survive-the-recession/ [Accessed on 2016, 27 February] (2008) 3 December.
[3] Nielsen, J. S. *Den store omstilling*, 2013 (Informations Forlag, Copenhagen).
[4] Emmott, S. *10 Billion*, 2013 (Penguin Group, London).

[5]   Ørstrøm M. J. *Masseforbrugets epoke er slut*. Available: http://www.information.dk/301009 [Accessed on 2016, 26 February] (2012).

[6]   Friis, S.A.K. *Conscious Design Practice as a Strategic Tool*, 2007 (Department of Education at Aarhus University and e-Types A/S, Copenhagen).

[7]   Dorst K. The Core of Design Thinking and its Applications. *Design Studies*, 32, 2011, pp. 521-532.

[8]   Curedale R. *Design Thinking Process and Methods Manual*, 2013 (Design Community College Inc., CA: Topanga).

[9]   Stake, R. E. Case Studies. In Denzin, N. K. & Lincoln, Y.S. (Eds.), *The Sage Handbook of Qualitative Research*, pp. 236 – 247, 1994 (Thousand Oaks, CA: SAGE)

[10] Flyvbjerg, B. Case Study. In Denzin, N. K. & Lincoln, Y.S. (Eds.), *The Sage Handbook of Qualitative Research*, 4th Edition pp. 301 – 316, 2011 (Thousand Oaks, CA: SAGE).

[11] Adriansen, H.K. and Madsen, L.M. Studying the making of geographical knowledge: The Implications of insider interviews. Norwegian Journal of Geography, 63 (3), 2009, pp. 145-153.

[12] Friis, S.A.K. Including Diversity in Creative Teamwork in Design Education. *International Journal of Design Creativity and Innovation*, 3 (3-4), 2014, pp. 239-255.

[13] Basadur, M. Leading Others to Think Innovatively Together: Creative Leadership. *The Leadership Quarterly,* 15, 2004, pp. 103 –121.

[14] Justesen, S. *Innovation Management as Nexialism*. Available: http://www.innoversity.org/ [Accessed on 2016, 26 February] (2008). Unpublished manuscript.

[15] Darsø, L. *Innovationspædagogik,* 2011 (Samfundslitteratur, Copenhagen).

[16] Friis, S.A.K. and Gelting, A.K.G. *DSKD Method Cards,* 2011 (Design School Kolding, Kolding).

[17] The 5C Model. In *DesignED Asia Conference*, Hong Kong, December 2014, pp. 32-39.

[18] Scharmer C.O. *Theory U. Leading from the Future as it Emerges*, 2009 (Berrett-Koehler, CA: San Francisco).

[19] Dorst, K. Frame Creation and Design in the Expanded Field. *She Ji,* 1, 2015, pp. 22-23.

[20] Nielsen, E.G, rector at Design School Kolding, newsletter, October 22nd 2015.