DESIGN ARGUMENTATION IN ACADEMIC DESIGN EDUCATION

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ABSTRACT

In this paper we explore design argumentation as a resource when teaching interaction design in a university setting. We propose that design argumentation can help bridge between practice-based design education and theoretical issues from university curricula. Building upon the Toulmin model of argument, we outline the idea of design argumentation and report on initial experiences from interaction design teaching. We discuss how this approach can be instrumental in teaching students how to build up a shared design vocabulary in order to formulate valid claims when arguing for and through their design work based on empirical, theoretical and material grounds.

INTRODUCTION

Our point of departure is experiences from teaching a variety of interaction design courses on BA and MA levels at the faculty of arts at Aarhus University. For many years, our teaching has been inspired by Donald Schön's work on 'learning by doing' in a supervised and reflective design practicum (1987) and the importance of developing students' design judgments (Nelson and Stolterman, 2003). However, challenges arise when integrating this practice-based approach in an academic setting that is governed by outcome-based education taxonomies (Biggs & Tang, 2007) and more traditional academic evaluation criteria. In particular, the issue of training students in working across the span from particular design situations, objects and interventions to more abstract theories and methodologies has proved a salient challenge.

In response to this challenge, we have for the past few years explored how the idea and practice of *design argumentation* can help bridge between practice-based design teaching and more abstract theoretical and methodological issues in an academic setting. We have found inspiration in the Toulmin model of argument (1958) to teach our students both how to make valid arguments *for* and *through* their design process and product, for critiquing their peers, and for presenting their work in academic exam papers. We have found the process of design argumentation promising in terms of creating alignment (Biggs & Tang, 2007) between learning objectives, the actual design work of students, and the evaluation criteria.

Here we present and discuss the notion of design argumentation and share our experiences from design education. We show how design argumentation fuses the practice-based approach of the reflective practicum with the idea of constructive alignment in university teaching. We particularly highlight how data and material experiments from students' design processes can be brought together with reflective and theoretical concerns presented throughout courses in the form of design arguments based on either empirical, material and/or theoretical grounds. This has proven instrumental in supporting and developing a shared design vocabulary and sensitivity to design values and, further, provides a ground for rigorous design discussions.

THE CHALLENGE: TEACHING DESIGN IN A TRADITIONAL ACADEMIC SETTING

The main challenge that motivates the work presented in this paper is this: *How can we integrate a practice-based approach to interaction design teaching in a traditional outcome-based academic education, in our case at the faculty of arts?* As is the case in a number of universities, there are a range of mandatory and optional design courses for students, however there is no full-fledged design education. The design courses must therefore fit into an established system of outcome-based education based on traditional academic evaluation criteria and formats.

The principle of *constructive alignment* (Biggs & Tang, 2007) has been very influential in shaping academic

education at several universities (including ours). Briefly summarised, constructive alignment is a constructivist approach to learning centered on the alignment of students' learning activities and the intended learning outcomes. While this approach is quite amenable to project-based learning in that it emphasizes the students' own learning activities as the most important component in reaching learning outcomes, many of the formal structures, teaching methods and evaluation formats at university are at odds with what we see in the studio-based approach in many design schools. As a consequence, we must consider how approaches and methods for design teaching that stem from design schools can be adopted, appropriated and supplemented to fit into this system.

In addition to systemic disparities between traditional universities and design schools, there are also challenges related to students' prior knowledge, expectations, and intended learning outcomes. When students take our classes, which are seldom at the first semester, they have already adopted certain academic skill-sets and mind-sets to which we must adapt our teaching. In addition, we must consider what the intended learning outcomes are – i.e. which ways of thinking and doing should characterize competent academic interaction designers. A principal challenge in this regard is how we construe the role of theory, and the ways in which design theory and practice can be combined and enrich one another.

RELATED WORK

The Nordes conference has been host to a series of discussions about design education, and there is a well-established discourse on the challenges and potentials of approaching design education in the Scandinavian design community in general. Many previous contributions promote practice-based design teaching, often in studio environments, to a large extent built around the ideas about the reflective practitioner and practicum as developed by Schön (1987). Here it has been re-iterated how in addition to academic training, interaction design requires skills acquired through practical experience (Cross 2001; Nelson & Stolterman 2003; Löwgren & Stolterman 2004; Koskinen et. al. 2011). The aim has been to ground a particular learning space for cultivating what might be termed a designerly way of knowing (Cross, 2001) or the designer's judgment (Nelson & Stolterman, 2003) by building bridge between real-world experiments, the design lab or studio and academic reflection (Löwgren & Stolterman 2004; Koskinen et. al. 2011).

Some of the challenges concerned with this fusion between design as studio-style learning and university teaching are explored by Blevis (2010). Blevis (Ibid.) introduces what he terms Design Challenge Based Learning (DCBL) as a possible values-led and sustainable pedagogical practice related to transdisciplinary design teaching. The goal of DCBL is to construct a confluence of studio-style learning with rigor and scale. This is facilitated through a variety of teaching activities addressing the pedagogical challenge of ensuring that the analytical work of the students leads to synthesis in a sound way, and, conversely, that synthesis follows from analysis in a sound way (Ibid.).

Moore and Lottridge (2010) deal with the challenges of working with interaction design in university concerned with new production of knowledge in a transdisciplinary setting. Focusing primarily on design research, the authors develop the notion of 'disciplined transdisciplinarity' understood as 'the simultaneous recognition of the value of disciplinary traditions in conducting research while at the same time recognizing the legitimacy of knowledge claims that go beyond disciplinary norms.' (Ibid., p 2740). Although the authors do not explicitly mention teaching design at the university, the paper clearly illustrates the challenges involved when working in a milieu with traditional academic departments and ideas of rigor.

Concerning the relation between design and argumentation more specifically, Buchanan (1985) discusses design as rhetoric, where the product is seen as an argument that wants to communicate with its users. Löwgren and Stolterman (2004) draw on the work of Horst Rittel on wicked problems to present what is termed 'design-as-argumentation', where they show that the use of argumentative notions in the form of questions, options and criteria (QOC) diagrams can be seen as a personal design technique. Finally, Binder and Brandt (2007) propose an agenda for experimental design research revolving around genealogy, intervention and argument. Here, argument relates to the fact that design research must produce statements that are contestable for the external reader.

DESIGN ARGUMENTATION

Inspired by the literature on design teaching, our approach to integrate practice-based design teaching in the university setting has been through the notion of design argumentation. Here, the Toulmin model of argument is in many respects central, in that it presents scaffolding for developing and analyzing design argumentation in a way that can bridge practice-based and theoretical concerns. The Toulmin model of argument was developed by the philosopher Stephen Toulmin, who dedicated much of his work to reasoning, rhetoric and argumentation, in the book 'The Uses of Argument' (1958). The model, which is now arguably the most widespread and accepted model of argument across a number of disciplines, was created to explain and develop practical reasoning; it can be employed to evaluate which argument has more explanatory power through discussion and justification. When we introduce the Toulmin model in this paper, it is in part because it is well developed and widely accepted in academia, and in part because it lends itself well to the process of critique. Developing an idea of practical arguments (as opposed to absolute arguments), Toulmin focuses on the justificatory function of argumentation as a process of

testing different ideas. Basically, for a good argument to succeed, it must provide a good justification for its claim, where the claim must be able to stand up to criticism. Toulmin proposes six interrelated components for making and analyzing arguments: claim, grounds, warrant, backing, rebuttal and qualification (Fig. 1).

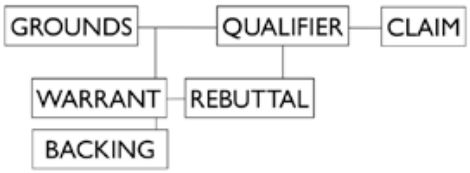

Fig.1: The Toulmin Model of Argument

We draw inspiration from all six components when attempting to develop the notion of design argumentation in order to cultivate a critical and academically rigorous dialogue through a shared vocabulary in our design teaching.

Our basic thesis is that students, by learning how to argue for their designs in an academically rigorous way, develop skills on how to relate theoretical and methodological concerns to design and, in turn, that design and design objects may become a vehicle of exploring theory and method in an academic setting. Hence, the process of argumentation mediates the students in moving back and forth between particular design objects and situations and more abstract theory and methodological issues. In the context of design teaching we both consider the claims made explicitly by the students, through oral and written presentations, as well as the claims made in and through the crafting of the actual design concept or product.

In general, we have found three categories particularly useful in terms of grounding design arguments. First, students may ground arguments in *theoretical* notions (e.g. aesthetics of interaction, situated action, activity theory) showing how their design choices resonate with established principles or models. Second, students may ground their arguments based on *empirical* data such as probes, ethnographically inspired field studies or workshops. Here, students point to particular findings and the methodological principles they employed to back their decisions. Third, students may ground their arguments in the design *material* with which they work. In this case, students may point to the possibilities and constraints inherent in e.g. smart phones, interactive tables or tabletop computers to argue for their choices. In all these cases, argumentation works as a way for students to articulate the qualities and potential shortcomings of their design. Moreover, the explicit use of argumentation opens up the space for critique allowing peers and instructors to engage in focused and precise discussions about the proposed design.

From our experience, the process of design argumentation also goes the other way; from the designed object to theory or methodology. In other words, where the process described above might be characterized as arguing *for* a design it also seems fruitful to argue *through* the design. In this process, the design object or concept becomes the catalyst for exploring a particular theory, concept or method. The proposed design object becomes a shared point of reference for developing an understanding of more abstract principles. In our experience from critique sessions, design objects have the strength of (sometimes) being very direct interpretations of a theoretical notion. As an example, an interactive table may provide a very clear way of explaining the difference between embodied and distant representation within tangible computing. In other situations, a design object may highlight an intersection between concepts or even challenge a theoretical notion. Again, argumentation becomes the vehicle that bridges the often challenging gap between the particularities of a design situation and the abstractness of theory.

To sum up, we propose design argumentation as a way of creating structured exchanges between particular design objects and theory. This process can potentially go both ways; students may make *arguments for their design* or they make *arguments through their design.* In practice, there are obviously continuous movements back and forth between these two. Drawing upon Schön, Biggs and Tang, and Toulmin, the idea behind design argumentation can thus be formulated as *arguing theoretically, empirically, and materially for and through design in a constructively aligned practicum.* In the following section we report on initial experiences from working with design education in five courses over a period of two years and outline considerations when incorporating design argumentation into teaching.

LESSONS FROM TEACHING

We have explored design argumentation as a central concept in a number of design courses over the past two years. In general, students work on design projects within a reflective practicum as an integrated part of semester-long design courses on both BA and MA levels in a variety of disciplinary settings (Information Studies, Digital Design, Experience Economy). A central component is that students are prompted to continuously reflect on their design choices on blogs, at critique sessions, through supervision, and in written essays. We have experimented with integrating the model of argumentation into these different modes of reflection with two major learning objectives in mind: first, that the students learn to argue for their design (i.e. what are the reasons underlying the current form of the design concept); second, that the students learn to argue through their design (i.e. how the design concept embodies specific considerations or can be used as a vehicle for generating certain types of knowledge). These notions resonate with Frayling's (1993) notions of research into, for, and through design.

When we introduce design argumentation into teaching, it provides a means for us to examine if and how

students have constructed sound arguments for and through design. E.g. in response to a written essay, we may ask students to provide additional types of grounds – empirical, theoretical or material data – to their claims, or ask what grounds their claims. In a supervision session, we may ask students to better warrant the grounds, or we can go even deeper and ask about the backing of the warrants (i.e. by asking about more information about the empirical data, the theoretical foundation of e.g. experience-oriented design or the process and rationale behind the crafting of the object/prototype). In critique sessions, we may use design argumentation as a reference point so that students who present their work can construct and evaluate their arguments, and so that students who offer critique can make clear what aspects of the design presentation they are critiquing. And of higher value still, we may use the ideas underlying design argumentation as a nexus for cultivating a critical way of assessing the design object by encouraging the students to always be reflective about possible exceptions and limitations of the claims they make, fostering attention to rebuttals and qualification.

On a more concrete level, we have identified three main considerations in terms of incorporating design argumentation into our courses. First, critique session have proved a valuable venue for the students to practice their argumentation both in terms of theory and concrete design. However, the format of the critique does mean that the designed object or concept is very present and draws attention. This is obviously a strength of the critique but it also means that e.g. theory tends be less present and it requires some work (form teachers or instructors) to bring theory or methodology into the critique session. One way of doing so involves choosing a theoretical ground from which the students are encouraged to make claims about their design object.

Second, our main focus has been on interaction design courses, even though the idea of arguing *through* a design might extent to other courses. In other words, we might imagine that designerly engagement could be used to scaffold learning activities in other university courses that explore theory or methodology related to arts education. Here, design becomes a vehicle for hands-on learning about theoretical concepts in an increasingly transdisciplinary university setting.

Third, while Toulmin's model of argument can be integrated with all of the aforementioned teaching and learning activities, it must be framed and employed with respect to the specific format at hand. E.g. in a written essay, it may be fairly straightforward for students to analyze their work through systematic reference to the components of an argument; in a critique session where students critique a concept, it is typically harder to pinpoint exactly which components they address, and the teacher can serve as an intermediary between the presenters and critics by facilitating a more structured discussion about the presentation of the arguments.

CONCLUSION AND FUTURE WORK

We argue that the notion of design argumentation is a promising way to combine the concerns of practice-based approaches to teaching interaction design at the arts in a university setting. We have presented design argumentation as an approach, which aims to teach students how to build up a shared design vocabulary in order to formulate valid claims when arguing for and through their design work based on empirical, theoretical and material grounds. We believe that design argumentation can be used both in the planning phase of the design course and as a way to navigate through the different design activities. As a consequence, we are aiming to develop the underlying ideas behind design argumentation into a larger framework practicing and evaluating courses in academic design education.

REFERENCES

Biggs, J. & Tang, C. 2007. Teaching for Quality Learning at University, Open University Press.

Binder, T. & Brandt, E. 2007, 'Experimental Design Research: Genealogy, Intervention, Argument', IASDR'2007: Emerging Trends in Design.

Blevis, E. 2010. 'Design Challenge Based Learning (DCBL) and Sustainable Pedagogical Practice'. Interactions, May/June 2010.

Buchanan, R. 1985. 'Declaration by Design: Rhetoric, Argument, and Demonstration in Design Practice', *Design Issues*, 2:1, Springer Verlag, pp. 4.-22.

Cross, N. 2001. Designerly Ways of Knowing: Design Discipline Versus Design Science. Design Issues (MIT Press), 17:3, 49-55.

Frayling, C. 1993, 'Research in Art and Design', Royal College of Art Research Papers series vol. 1 no. 1. Royal College of Art, London.

Koskinen, I., Zimmerman, J., Binder, T., Redström, J., Wensveen, S. 2011. Design Research Through Practice: From the Lab, Field and Showroom. Morgan Kauffmann.

Löwgren, J. & Stolterman, E. 2004. Thoughtful Interaction Design, MIT Press.

Moore, G. and Lottridge, D. 2010, 'Interaction Design in the University: Designing Disciplinary Interactions. Alt.CHI 2010, Atlanta.

Nelson, H. & Stolterman, E. 2003. The Design Way. Intentional change in an unpredictable world, Educational Technology Publishers, New Jersey.

Schön, D. 1987. Educating the Reflective Practitioner, Jossey-Bass, San Francisco

Toulmin, Stephen E. 1958. The Uses of Argument, Cambridge University Press