Intention-Centred Design Education: Beyond Methods and Techniques

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Abstract
Design work can be driven from a variety of intentions, e.g. to serve users, to generate profit, to explore a new concept, or to trigger reflection and debate. However, it is not always clear how such intentions can be addressed concretely in education, and in specific design domains, such as interaction design, they might easily get lost among course content related to specific methods and technologies. In this paper, we discuss how we have addressed design intentions in our advanced course in interaction design, and also what we see as its main qualities in relation to more conventional course structure in this area.

Keywords
Interaction Design; Design Education; Design Intentions.

Introduction
The acknowledgement of design judgment as a main trait of skillful designers is now broadly established (see e.g. Nelson & Stolterman, 2003), and also regarded as a skill which can and should be practiced in design education. In design schools, this skill is taught for instance through design critique sessions (e.g. Reimer & Douglas, 2003), through critical analysis of existing products and experiences (e.g. Bardzell, 2011), by practicing methods for understanding people and usage (e.g. Dourish & Button, 1998), and through reflective design work using various tools and materials (Schön, 1983). A common aspect for almost all works in this area – at some level – concerns methodological issues, and how to practically develop more grounded and reflective approaches to design practice.

In this paper, we describe how we have addressed this challenge within our teaching practice, by placing an increased focus on higher level intentions as a general theme in one of our master level courses in interaction design. We will also reflect on our experiences from running this course over a period of three years, along with the values and challenges that emerged in our specific context, which in essence is a small studio-based design course taught in a school of engineering. While the foundations underlying this work may already be embedded in knowledge practices, either on the web, in established design practice, or within other similar courses, we recognize a need to engage more specifically with these topics in relation to teaching and education within the design research community.

Background
There are many different frameworks and taxonomies for how design work could be understood from a more methodological perspective. As an example from the domain of interaction design, Dan Saffer (2009) has argued that there are five major approaches to designing products: user centred-, activity centred-, data-driven-, systems-, and what is sometimes referred to as genius design. These approaches should not be seen as mutually exclusive, but rather serve the purpose of bringing light to the general observation that successful design work can be executed in different ways. Depending on the task, some approaches may be more suitable in a particular situation. A dilemma that
Saffer puts forward, is that user-centred design methods (UCD), which has been the most actively proposed in HCI and interaction design education, may not always be the most successful method when it comes to real product design cases. A secondary role of the framework could also be to emphasise that user involvement can never substitute the judgments and activities performed by skilled designers. Therefore, Saffer’s taxonomy includes different methodological approaches, with UCD as one of many.

While the focus on methodological approaches is relevant to all design work, we will here instead discuss design judgment within a landscape of different underlying purposes on a more conceptual level, and how we have addressed this in our own educational practice. A variety of models elaborate on what aspects might be considered from a certain perspective, e.g. in terms of action and experience (Fernaeus, Tholander, & Jonsson, 2008), or from a perspective of materiality or form-giving (Vallgårda 2013; Gross, Bardzell, & Bardzell, 2013). Other higher-level discussions has concerned the characterisation of design itself, e.g. as the merging of Art, Science and Technology of Bauhaus (Findeli, 2001), or Nigel Cross’ definition of design as Discipline, as opposed to Science (Cross, 2001).

The work presented in this paper is heavily inspired by the ‘four fields of design’ articulated in an online article by Bruce and Stephanie Tharp (2009). This framework took its starting point specifically in the profession of industrial design, but has in our case been implemented for education in interaction design. The ‘four fields’ comprises a taxonomy for design work focused on different types of higher-level purposes, or intentions:

- Commercial design: with the general intention to generate profit
- Responsible design: intending to do ‘good’ or serve the unserved
- Experimental design: with focus on the process of learning and exploration
- Discursive design: with a higher level goal to generate reflection and discussion

While these different intentions typically overlap in parts, the main argument put forward by Tharp & Tharp was that articulating them could help designers seeing how intentions might interplay with and sometimes even contradict one another. Thereby they could guide discussions and potentially help judging the outcome of a design, although a taxonomy such as this will naturally only articulate partial understandings of certain relationships.

The framework was also used to acknowledge the growing terminology of approaches used within the design field. As put by Tharp & Tharp (2009):

“Just try and make sense of the range of the terms floating around out there: user-centered design, eco-design, design for the other 90%, universal design, sustainable design, interrogative design, task-centered design, reflective design, design for well-being, critical design, speculative design, speculative re-design, emotional design, socially-responsible design, green design, conceptual design, concept design, slow design, dissident design, inclusive design, radical design, design for need, environmental design, contextual design, and transformative design.” (page 1)

All these terms refer to aspects of importance to design practice, but that go beyond both the ‘type’ of product being produced (e.g. mobile, tangible, graphic), as well as specific design methods. In addition, the academic discourse has been concerned with similar terms as tools for understanding and shaping design practice, with concepts such as ludic design (Gaver et al, 2004), design for ambiguity (Gaver, Beaver, & Benford, 2003), translucency (Dourish & Button, 1998), seamfulness (Chalmers & Galani, 2004), among others. It has even been argued that the development of such concepts, so called ‘strong concepts’, is one of the main contributions of design-based research (Höök & Löwgren 2013).

With this as a starting point, we wanted to explore how the four fields could be used to
guide interaction design projects in a master level course at our university. We will give a brief overview of the content and structure of the course, how we have implemented themes and assignments, and a short analysis of how these have played out in practice during the three years we have implemented this setup. We end with a brief discussion based on reflections and learnings from these experiences, in relation to our expectations and experiences from similar courses that use a more methodological course focus.

Case: Intentions in Interaction Design Education

There are many ways to structure interaction design education. A general challenge is to develop a format that brings in more designerly values to an education that has traditionally been grounded on engineering and social science. A common way in more technically oriented contexts, e.g. in computer science schools such as ours, is to provide themes or course modules based on different types of interaction technologies, e.g. graphical interfaces, tangibles, mobile computing, sound and haptics. This is in many ways a logical structure, since it allows students to focus deeply on different technologies and thereby learn about the broad design space that each of these areas provide, which is an important part of becoming a skilled interaction designer in a technical domain. These activities are normally complemented with course content that focus more on theory and exercises related to general methodological issues, such as conducting field studies, engaging users in the design process, and methods for ideation, sketching, and working in a team. However, since there are so many different approaches and settings for the making of interactive systems, our experience is that it is often difficult to cover all the relevant aspects in a structured manner. To address this challenge, focus in our advanced interaction design course has not been on how to practically conduct design work, but rather on how to develop and judge design as a central part of the design process, based on its overarching design intentions.

The course has been offered in a similar format during the last three years, covering four smaller design projects, each representing one of the abovementioned ‘four fields’. Each of the four projects lasts 4 weeks and is conducted in pairs, with students working with a different partner in each project. The course ends with a presentation of an individual online portfolio, showcasing all four projects. Important to note is that we have had the privilege to organise this course in an intimate studio format, with a limited number of 16 students, running at 50% study speed during 20 study weeks. This naturally allows a structure heavily based on personal supervision, external study visits with the whole group, and weekly design critique sessions. However, since countries and schools have different teaching conditions, our focus in this paper will be on the conceptual content rather than on specific practical arrangements.

It should also be noted that this is an advanced course in the subject, and the students are therefore expected to already know how to independently drive an interaction design process, i.e. knowing how to apply established methods for field studies, ideation, state-of-the-art analysis, user involvement, prototyping, and documentation in the form of video and academic writing. The students are also expected to have an idea of the research front in the field, and to be familiar with design issues related to different types of interaction technologies. The focus of the course is thereby almost entirely focusing on issues related to intentions and fundamental approaches to practical design work. Below is an overview of the four themes as interpreted and implemented in our course.

**Experimental or Exploratory Design**

Experimental Design (or what might also be called exploratory design), refers to design work where the main goal is not necessarily a finished product, based on readily defined briefs with sketches, plans, or requirements. Its primary intention is instead to explore, experiment, and discover within a chosen frame, for instance a specific technology or technique, theme or concept. Typical examples reside within learning contexts and
academic projects following a research-through-design process (Zimmerman, Forlizzi, & Evenson, 2007). Within technically fast paced domains, such interaction design, this is also a relevant design approach outside of academia since emerging interaction technologies, development tools, hardware platforms etc., constantly require new learning. Experimental or exploratory design work may well result in complete products at a later stage, but the primary intention is much more open – and may even see value in design ‘failures’ (see e.g. Gaver, Bowers, Kerridge, Boucher, & Jarvis, 2009). Thus, these types of design projects value the process almost as much as the resulting product and are motivated and driven primarily by curiosity and an interest in learning.

In our course, this theme starts off with a design brief asking the students to explore a topic, concept or technology beyond what they already know. Previous examples in our case have been to design something based on exploring the functioning of a chosen sensor of a smart phone, or to work hands-on with e-textiles. In our latest course round, students got a brief to explore new concepts for interaction at a newly set up museum of dance. The task for the students was to explore possibilities around the general topic of dance in the museum setting, along with testing out different possible technologies (see Figure 1).

**Figure 1. Conceptual designs on the experimental theme, from left to right: Strike a Pose - Visitors are encourage to imitate dancers and thereby explore their own body image in a playful manner. Design that attempts to catch by-passers attention and spur a curiosity to visit the museum. Image recognition used in an app to identify artifacts and access richer descriptions and other media connected to the artifact.**

This rather specific brief worked well in this case, since the personnel at the museum wanted input on what might be possible or not, rather than a solution. The students were therefore not pressured to develop something fully working, but rather to explore possibilities. The topic of dance in itself also seemed to force the students outside of their own comfort zones and encouraged them to work hands-on with technologies that they were less familiar with from beforehand. Resulting in a range of novel scenarios and setups, including interaction contexts such as the street outside of the museum, visitors waiting in line for the toilets, and the use of a medical stethoscope as an interaction device. In addition, the students explored various ways of interacting in an exhibition space, ranging from mobile applications to physical exhibits, combining experiences from other museums and applying it to the topic of dance.

The staff at the museum, who had initially expected to see a presentation of eight different types of mobile app-based solutions, were excited by the results, and are now considering to implement several of the designs in some form. But the main outcome of the process was to open up a design space, explore possibilities, and for all the involved partners to learn something, which is also from an academic perspective an important purpose of design work at large.

**Commercial Design**

Commercial design refers to design aimed at the real economic market. Economy is an important component of any design work, so what the commercial intention adds is
primarily that the design itself gets grounded much more concretely on what might be desirable on a market, as well as, how the business model of that product would take form and in turn shape the design. The goal is thereby to create attractive, useful, and well functioning products, but with design judgements focusing primarily on potentials for commercial profit. In interaction design specifically, business models are often very deeply intertwined with the design of the interactive product itself, as shown in examples such as streaming media services, ad-sponsored mobile applications, open hardware licensing, and a broad range of electronic currencies and interactive payment systems. Investigating how such systems and models work is therefore a very relevant topic for interaction design students.

In our course, we have let this theme stay as an open brief, placing much focus on the process of ideation, discussion, and grounding design choices in existing use practices. The general task has been to come up with a concept for an interactive product or service that would have a potential of becoming a commercial success. The students are also asked to make the business model a part of the interaction design and to deliver a ‘finished’ design (see figure 2), personas, realistic scenarios for interaction, and a proposed plan for bringing the product to market. Core to this design challenge is to develop concepts that are well grounded, in technological realities, be it in research or what exists on the market.

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Figure 2. Screen designs of commercial design concepts, from left to right: A concept that aims to help customers at a furniture store figure out what furniture would fit in their car. Tool for turning blogs into physical books. Conceptual design for families to stay in touch and privately share pictures and videos.

Our impression is that this has been a tough challenge for the students, but they have also shown much enthusiasm, and some have continued working on their ideas after the project ended. The serious focus on business models and who might be ready to pay for a particular product or service highlights the complex realities of interaction business. Being able to discuss different types of business models and how each of them relate to interaction design, is a topic that – in our experience – is often overlooked in ordinary interaction design education. Ironically, this is core to any successful commercially viable interaction design work, independent of other higher level intentions. Even systems designed within other themes, also in research, have been brought to discussion here, highlighting how the fields often overlap in interesting ways.

**Responsible design**

The concept of responsible design refers to design that place ethical and humanitarian aspects at the forefront. May it be to design for people who are ignored by the market, environmentally friendly products, or otherwise to counteract different types of social or physical suffering (see e.g. Papanek 1972). While commercial products can and should take such aspects into accounts, the orientation is different as the main measure for success is here not framed in economical terms. Rather it is framed in terms of other values, more in line with what has been referred to as ‘worth’ (Cockton, 2006) or what Batya Friedman refers to value in value-sensitive design.
Figure 3. Example screen designs from four passed projects, from left to right: Two concepts exploring novel ways for foreigners to use public transport. Two solutions for families with children and teenagers who alternate living with separated parents.

On this theme we let students select and redesign an existing system of their own choice, and which they would argue being ‘irresponsibly’ designed in its current form. The definition of responsibility is then left open for the students to discuss, define and motivate, with grounding in literature. Making students start with the existing situation to improve on also reflects a typical interaction design practice, where you would only rarely start out completely from scratch and spend a large part of the process at the ideation stage. This have also resulted in a very broad variety of projects, ranging from adapting existing services for people with special needs, to cater for more sustainable solutions, to improving poorly working systems in general. This way, the brief also opened up for more general discussions regarding different interpretations and perspectives on what is actually meant by responsibility in design, and how it can be practically addressed.

In previous years we have given more narrow design briefs, e.g. to let students design tools to help foreigners finding their ways through the public transport system in our city, another year the brief concerned tools for children to manage the situation of living at alternate places due to separated parents (see figure 3). What we valued in these two design briefs were that they took a perspective of responsible design that focused on ordinary issues where interaction design might actually enhance a currently complex situation. In other projects in similar courses we explored more complex issues, e.g. designing for alone-coming teenage refugees, which as such brought in a series of higher level humanitarian and political matters that are difficult to address through the design of interactive systems alone. Although these projects have been extremely interesting, we found that the open briefs on this theme seems more beneficial in terms of keeping the discussion focused on the overarching theme of responsible design.

**Discursive and Critical Design**

The fourth and final of the four fields concerns designs which might not necessarily be oriented towards the market, but rather to trigger reflection and awareness around topics worthy of discussion. Sometimes to make explicit a problematic or ironic issue of some sort, directed towards the society at large or to a more specific community. Examples include explicitly norm-critical or speculative designs, design fictions and provocations, designs that might dwell over into the art scene and where primary measures of success could be to get exhibited in respectable museum settings or to turn viral in social media. Rather than ‘mere’ art projects however, these projects are actively referring to current design norms by focusing on utilitarian objects and function, while at the same time carrying ideas and provoke thought beyond the utility of the artefacts themselves. Much design work within the academic sphere belong in this group (perhaps most notably Dunne & Raby’s Critical Design). Tharp and Tharp (2009) describe critical design as just one form of discursive design, but since critical design is a more well-known term in interaction design literature, we like to highlight both terms here.

Interaction design includes many extremely well known examples on this theme, stretching from gimmicky installations such as the Fun Theory experiments of Volkswagen, to dark dystopian designs presented in science fiction, as well as a growing range of
examples presented in academia (e.g., Purpura, Schwanda, Williams, Stubler, & Sengers, 2011). Since this type of projects tend to achieve a very broad visibility and popularity, it is reasonable to argue that educated interaction designers should have an informed relationship towards these types of designs, even if it might not represent what most designers get to work with for a living, or what most people will actually get to interact with. Understanding the value of these designs requires an understanding of intentions as beyond use and user experience.

However, although some of our students have been seriously excited about this theme, it has also been the part of the course that most have struggled the hardest with. Parts of this difficulty could be due to the brief, which we have let stay fairly general and open, i.e. to articulate and re-think existing norms in interaction design, questioning some what is might otherwise be taken for granted. This sometimes resulted in design ideas that were found extremely interesting among the teachers, but that the students themselves dispelled as silly and irrelevant even before they started the actual design. Our students all have an engineering background, and working on a design challenge without a given problem to ‘solve’ require a slight shift in mindset from what they are used to, which might also affect this experience.

![Figure 4. Snapshots from three discursive design videos, from left to right: A concept that applies current business models with augmented reality glasses and critiques how it could intercept our perception of the world. Conceptual design playing with gender roles and lets girls drink and select clothes for their boyfriends in a game like and social media inspired fashion. A physical matching game based on ambiguous design terminology.](image)

Parts of the difficulties that we have experienced could also be that we on this theme have let the students present their designs in the format of video (see Figure 4 for some snapshots), which in itself has been a new medium of expression to some of the students. Perhaps influenced by the format, many groups chose to present scenarios of what could go wrong, using the storytelling genre of dystopian science fiction. Although this is indeed a perfect way of bringing up discursive matters in the field, our experience has been that the actual interaction designs sometimes lacked a clear focus in favour of higher-level narratives. In other cases, the students focused entirely on the humorous aspects of their scenarios, using irony to the point that the discursive message became difficult for an outside person to decode. In some cases the students were even reluctant to include their videos in their public online portfolios, which was a requirement for passing the course.

Although mixing the theme of discursive design with video scenarios was successful in most cases, it also added extra layers of complexity as it takes time, skill and effort to make a video. To us, the most interesting part of this theme has concerned discussions around existing examples and literature, and to engage students with strong engineering identities in reflections around more conceptual artistic values.

**Discussion**

The work presented here is heavily influenced by the ‘four fields’ of design, as defined and proposed by Tharp and Tharp (2009). There are surely many other concepts that also could be valuable for the purpose of articulating the intentions in educational contexts.
such as ours. For instance, in our specific case it might be relevant to place more emphasis on topics and terminologies that are specific to the area of interaction design. However, we find that the four fields have worked as a solid enough base for structuring our course.

In our experience, the four fields have shown to – at least to some extent – help design students to “better understand and focus their projects” (Tharp & Tharp 2009). First, commercial profit, as an intention commonly overlooked in academic design contexts, proved to spur deep discussions and thereby ensure quality of education in terms of the broad spectrum of issues and solutions connected to designing something commercially viable. Second, by shifting the intentions towards responsible design, students were given the opportunity to discuss and engage with what it really means to be responsible in design projects, discussions that have often turned out incredibly interesting. Third, the theme of experimental design have proven to be a fruitful tool to trigger deep technological engagement and playful exploration among all students. Rather than working with tools that they already know, which easily gets the case when asking students to deliver working prototypes, the experimental theme invited students to discover possibilities that they might not know of yet. Interestingly, the theme of discursive design has turned out as one of the more problematic themes in the context of our education. Surely, producing a clever and to the point discursive design can be difficult, and the process may not be as straightforward as to have commercial, responsible or experimental intentions. Yet, since it is such an important field in research and art contexts, and also in terms keeping a reflective stance towards innovation, we will continue our struggle on this topic with our students.

Most clearly, the framework has been effective in structuring our education so that it ensures a broader range of design challenges. Without such a structure, our design briefs and projects have previously tended to get defined in a more ad hoc fashion, based on what seem relevant in terms of scope, technology, and ongoing research projects. While that in itself is not necessarily a problem, it might result in student projects unintentionally ending up very similar in character, with the risk of missing important points for discussions or aspects of value in a design. The structure of the four fields has also worked as a useful frame for engaging collaborations between students, researchers and partners in industry, as we now know well beforehand what types of projects and perspectives we are looking for.

Apart from being a help in structuring the course as such and to provide a rich variety of projects, we feel that the four themes help channelling student focus to concentrate on what is most important for a given design brief. The structure also ensures that several groups work on different projects but with similar higher-level intentions, thereby also facilitating a breadth within each theme as students get to dig deeper into the different problems and areas for investigation.

Another experience from this thematic format has to do with the structure of intellectual discussions in the classroom. Seeing that interaction design can be driven by different high-level intentions means that students need to acknowledge that success can be measured in several different ways, and that a design task is not always as straightforward as solving a technical or conceptual problem. This brings up interesting questions to discussion, regarding what we value and take for granted as desired, good quality, or successful in a specific design process.

The extent to which the students have been willing to discuss such matters is in our case obviously affected by the intimate course size, but it also seem heavily influenced by the varying focus of the four themes, which helped guiding discussions in new interesting ways. The commercial theme brings focus to personal experiences of products, trends, and markets. The experimental theme brings more focus to what is known about research and new technologies. The responsible design theme brings in aspects of ethics and how
to approach people and their values. Finally, the discursive theme brings to debate a discussion around current design norms and political perspectives around the field as a whole. Without the four themes, these discussions would, again, probably become structured in a much more ad hoc fashion, grounded much more in specific research interests of the teachers, or topics brought up freely by the students. This is not to say that such discussions would necessarily be any less interesting, but probably less varied and dynamic. The themes thereby open for reflections around the relationship between education and research, and how we can develop this relationship so that research and education could benefit – as naturally as possible – from each other.

Relevant to our specific experience is also that the students that we work with have undergone a long education that has a strong thread of classical sciences and engineering, in contrast to design students with more artistic backgrounds. In comparison to traditional engineering education, we believe that discursive design especially might have a similar role as mathematics traditionally has had, namely, as an intellectual exercise with qualities to expand thought. Here, instead of practicing logical thinking, students are confronted with the challenge of engaging in more conceptual design thinking. From this perspective of practicing thought, discursive or critical design could be argued to deserve a strong and natural place in design education, just because it is difficult and entails so many conceptual challenges.

Finally, our approach to the four themes have been slightly different each year, and we see many potential ways that this could be structured differently. One interesting approach, which we have not yet tested, is to connect the four themes more concretely, e.g. by having the same overarching design brief stretched over the entire course and then approached using the four intentions.

Concluding Remarks
In this paper we have discussed our explicit focus on design intentions in the last three instances of an advanced course in interaction design, and what we see as its main qualities. The work is inspired by a framework that suggests that design is normally driven by one of four major types of intentions: to serve users, to generate profit, to learn, or to trigger reflection and debate. In general, the course structure seem appreciated by the students, and the most positive expressions has concerned the amount of time spent on reasoning and talking about complicated issues. Although the framework was presented as a resource for practicing industrial designers, it seems to have some value also in the education of interaction design, and probably in other design fields as well. In particular, we see clearly how this approach aids the student in mapping the landscape of underlying intentions, something that in turn helps to shape and guide their design processes.

References


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**Anders Lundström**
I am a PhD student in Interaction Design at KTH with a background as Interaction Designer. In my PhD work I focus on energy and mobility in the practice of driving within the domain of electric cars. I have been involved in the teaching of our Interaction Design students at various levels at our school. In the course discussed in this paper I have been involved in the last course round but have followed and discussed the course format during all three years of relevance to this paper. The analysis and writing has been done in close collaboration with the main author of this paper.