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Intuition, Reflection and Reflexivity

Participatory Design for Shared Medical Decision Making

Abstract

This paper synthesises findings from a design method course that focused on a design brief in shared medical decision making. In the paper, design methods is a term describing any action undertaken for a forward movement in the design process. The course is based on a selection of assignments that target intuition, reflection and reflexivity. Although many science disciplines strive to include more elements of active and practice-based learning, design education faces the challenge of integrating theory in a ‘designerly’ way. The current curriculum offers little opportunity to train these skills together with traditional practice-based ones. However, the complexity of design tasks in interconnected systems with manifold stakeholders and users requires a cohesive design research approach to govern its inherent complexity. Using the findings of this case study, design students can integrate theory in their practical work and welcome the confrontation found in current design research literature, helping them contextualise the meaning of design, be inspired and develop an individual stance on the purpose of design.

Keywords: design methods, shared decision making, intuition, reflection, reflexivity

Introduction

Design is a driver for novelty and innovation, increasingly addressing social and ecological challenges; healthcare, education and environmental pollution are areas design can be applied to. This is not an entirely novel or only contemporary approach, given the social design movements of the 1960s and 1970s (Fuller & Snyder, 1969; Papanek, 1971; Papanek & Hennessey, 1977), but applying design to these areas is an inclination with a current boom (Margolin & Margolin, 2002; Melles, de Vere, & Misic, 2011; Thorpe & Gamman, 2011; Banathy, 2013; Manzini, 2015). This actuality is made clear by movement in design toward a post-industrial, social design relevance, where the term design is used in several ways; as much as it is a traditional graphic and layout design of a patient brochure, it is also connected to the design of broader systems and, as such, to the communication process itself.¹ In design research, the main four generations of methods in design are craft, design-by-drawing, hard systems methods and soft systems methods (Broadbent, 2003). Although hard systems methods are associated with linear problem solving, soft systems methods indicate that design solves ‘wicked problems’ (Rittel & Webber, 1973).¹ These challenges are interwoven in a complex way, so design can come up with the ‘ultimate particular’ (Stolterman, 2008) but not truth. Broadbent argues that design is experiencing the emergence of a fifth generation based on human evolutionary systems: ‘Such a development will position design as an evolutionary guidance system for socio-culture, a much more central role in human affairs’ (Broadbent, 2003, p. 2). Approaches such as social innovation, social design, co-creation, design anthropology and empathic design, to name a few, clearly demonstrate design’s transition into social realms, and consequently, the use of approaches borrowed from disciplines such as anthropology and the social sciences gains importance.

This change of the design paradigms is imperative for understanding the context surrounding how to educate contemporary designers. Whereas until the late 1950s the designer was an intuitive artist related to design-by-drawing, hard systems methods represent

the search for a rational, science-based design practice. Christopher Alexander (1964) and Bruce Archer (1965) exemplify this line of argumentation. Overwhelmed by the number and scale of design tasks in the 1960s, the idea of dissecting design problems into their smaller parts to solve the overall problem gained momentum. In the 1980s, designers were asked to use bounded rationality. Schön (1983) embodies this idea of a reflective designer and compared the design practice with psychotherapy, arguing that both are practicing reflection in action, making decisions in the moment. Contemporary participatory design argues for a more egalitarian idea of people as design partners. Sproedt and Larsen claim that in this context, '(...) the innovation process emerges not as a result of one singular idea or intention, but in the meeting of differences' (Sproedt & Larsen, 2012, p. 1004). Likewise, contemporary design challenges in healthcare reflect the call for design methods that cater to a more equal relationship between patient and clinician. In light of a contemporary design practice that has moved away from linear problem solving toward collaborative, systemic thinking, what kind of designers should be educated for the future and what kind of skills should future designers be provided with are topical issues.

Design Methods in the Curriculum: Toward Reflexive Formats

'Design methods' is a term used in this paper to describe any action undertaken for a forward movement in the design process. Consequently, this section looks at how research has attempted to address the challenge of teaching design methods integrating a meta level of purpose and responsibility.. Human-centred design (as an umbrella term), participatory design and inclusive design are three typical examples. Hanington (2010) proposes a model for human-centred research in design education, defining it as '(...) an integrated process that includes active consultation with people (users) through various means of primary research during all phases of design development' (p. 18). Hanington sees a general lack of specific exposure to design methods in industrial and communication design and suggests a process-oriented model, one which originated from Carnegie Mellon University. This model is based on a discovering, making and refining phase for evaluation and is suggested to be linked to a studio project, a link that can also be found in course structures that use inclusive design and participatory design frameworks. Sanders, Brandt, and Binder (2010), for example, propose a framework for participatory design based on form (making, telling and/or enacting), purpose (why the tools are used, e.g., understanding the design partners' experience or for generating ideas) and context (where and how the tools are used). Thereby, participatory design focuses on the entire relationship between the design and research team and the participants (Sanders et al., 2010). Inclusive design methods, on the other hand, emphasise design exclusion as an ethical and economic problem, thereby proposing a phased approach in which phase 1 explores the potential, phase 2 establishes the foundation, phase 3 implements changes and phase 4 consolidates the expertise (Clarkson & Coleman, 2015). All three models share a focus on teaching specific methods in the context of a studio project, but they do not necessarily discuss their broadening with different levels of learning, such as students' individual approaches or reflective exercises within the studio project framework. Developing empathy with users through co-creation or ethnographic research methods ideally supports the understanding of social needs, but it does not automatically reinforce student designers' own design approaches or the uptake of novel design research approaches. The literature on the design curriculum shares a long history of a call for broadening design method's teaching by integrating the meta level of purpose and responsibility.

In the context of Baushaus' famous *Formlehre* and *Werklehre* that strive to synthesise art, science and technology, Wassily Kandinsky asserts the need for a 'philosophical foundation' in design education (Kandinsky, 1928 [reproduced by Winkler, 1969, p. 147]); a

need, resonating in more contemporary writings such as Findeli's (2001), points to a decisive lack of discussion about the overall purpose of design education and practice:

The questions to be asked are: To which meta-project (anthropological, social, cosmological, etc.) does a design project and a design curriculum contribute? For what end is design a means? Can design find its *raison d'être* within its own field and remain autarchical? How autonomous can design be? All these questions are related to the ethical dimension of design (...). (p. 10)

Contemporary design briefs situated, for example, in healthcare force design students to see their own practice in relationship to social, ecological and economical dimensions. Acting within a system — also as a designer — naturally means, 'One cannot act *upon* a system, only *within* a system; one cannot act against the "intelligence" of a system, only encourage or discourage a system to keep going its own way;' (Findeli, 2001, p. 10). In broader research practice literature, there is a tradition of calling for reflexivity, arguing that the social, personal and cultural contexts we inhabit and work in impact the ways we interpret our world (see, Etherington, 2004, p. 19). Reflexivity includes thoughts on why particular frames and tools for thinking are chosen, which ideally lead to reflection and self-change while reflectivity uses 'mental tools' to build understanding, to learn or to solve a problem (see, Hibbert, Sillince, Diefenbach, & Cunliffe, 2014). Based on this argument, learning design processes works on several levels, including the individual and meta levels. Beyond design competence, design education provides a platform for developing professional responsibility, creating awareness for design's purpose and cultivating individualistic ethics (Findeli, 2001).

In conclusion, whereas publications on design curriculum acknowledge the need for an integration of reflective thought and practice, alongside questioning a design project's purpose, teaching formats typically unify design methods with a studio project but lack the integration of readings from design research and a structured reflection of individual design approaches. The present paper proposes a novel way to overcome this challenge: by contributing a design pedagogy that employs a threefold approach in one course rather than dividing theory, practice or methods into separate courses within the curriculum. Thus, this paper looks at a course on design methods that provides a more seamless integration of design theory and practice that fosters reflexivity and chooses shared decision making as a design brief, which is archetypal for a participatory, socially grounded design task.

Design Methods for Shared Decision Making

Shared decision making (SDM) is a process that helps patients work with their clinicians to make better informed treatment decisions about tests, medications or surgeries. As a concept, it represents the international state-of-the-art in patient-centred care, with patient involvement being an essential element for high-quality care (Kitson, Marshall, Bassett, & Zeitz, 2013). SDM argues that healthcare professionals should not be the only parties with access to evidence; instead, SDM presupposes more equality, respecting patients' values and healthcare professional's recommendations (see, Légaré et al., 2014, p. 6). SDM is part of a broader discourse on participation in museology, education, politics, art and design. In politics, grass-root movements and parties are a strengthening phenomenon (Amsden, 2013; Schneider, 2015) while open and user-driven innovation is seen as a supply for manufacturer-centred innovation (von Hippel, 2005; Baldwin & von Hippel, 2011). Participatory innovation (Buur & Matthews, 2008) is discussed as a further development of participatory design and is thus strongly related to (the Scandinavian) design culture. Museology and art mediation call for transformative participation, revealing the structural conditions of the museum and for participating (Mörsch, 2012). SDM shares objectives such as transparency and knowledge transmission to non-professionals as a precondition for participation; in this respect it shares

similar goals with these mentioned movements in other sectors of society and disciplines. An exploration of design methods in relation to SDM is also an examination of the conditions and processes that enable or prevent participation; and this exploration is a way to uncover collaborative aspects in design and healthcare. Current concepts in SDM have difficulty when it comes to inclusiveness, integration of people's experiences and needs beyond the clinic. The text dependency, and thus solid reliance on reading abilities, is problematic given the diversity of people using healthcare systems. Overlooking practical, everyday aspects, individual experiences and socio-economic factors might disadvantage the widespread implementation of decision tools (e.g., how individual mobility or the level of family support can influence decision making). What healthcare systems value impacts healthcare pathways and care. Consequently, SDM initiatives depend on national actions and measures. To what extent practitioner skills are trained or the time frame allowed for decision making is fundamental but cannot be solved at the local level. A difficulty is consequently the fact that SDM is tied to the large-scale dynamics of national healthcare systems. Apart from the interrelation between local and national systems that makes it difficult to enact new solutions autonomously, shared decision making can also be criticised for establishing a set order in care, one that is preferred over individual values. Anthropologist Annemarie Mol contrasts 'choice' with 'care' in her book *The Logic of Care: Health and the Problem of Patient Choice* (Mol, 2008) and argues that patient choice can lead to poor care, shifting '(...) the weight of everything that goes wrong onto the shoulders of the patient-chooser' (p. xii). Additionally, and connected to the great individuality of personal preferences, SDM is not welcomed by every patient (Deber, Kraetschmer, Urowitz, & Sharpe, 2007; Robinson & Thomson, 2001).

With patient confidentiality being one of the core concepts in healthcare, a student course that focuses on SDM acknowledges healthcare's current heightened confidential requirements. Because of its ethical, professional and legal obligations, student access to vulnerable cancer patients cannot be given in the context of a short term design method course.

Based on the literature review, the present paper makes the following propositions: Contemporary design practice moved from linear problem solving toward collaborative systemic thinking. As a result, the tool box and skills needed by future designers must change to adapt to this interrelated design pedagogy; designers are increasingly required to reflect on design decisions in a broader social, economic and ecological context. To do this, design pedagogy shall not only connect head and hand, meaning to relate theory with practice in a more seamless way, but it needs to give design students room for developing a reflexive, philosophical foundation for their work. Assignments supporting this could be grounded in students' own intuition but should be connected to a broader design theoretical discourse. Shared decision making forms a prototypical example of this claimed systemic approach in design and hence is a relevant briefing in an educational context. However, health information and confidentiality prevent design students from working with patients. This calls for teaching formats that embrace these limitations without compromising a culturally informed design approach.

These ideas lead to the following research question: the present paper investigates how to advance design education to more effectively teach design in the context of broader systems and analyses to what extent a pedagogy targeting intuition, reflection and reflexivity supports the students' learning.

Methodology

The methodology used for this paper is the participatory observation of and reflection on a new course on design methods (Healey, 2005; Fitch, 2004; Garrison & Kanuka, 2004). Technology in the classroom was used to facilitate dialogue and integrate the students' point

of views on the research question discussed above. After each of the three assignments were covered, the e-learning tool *Poll Everywhere* was used to collect written statements from students, reflecting on their own learning of design methods. *Poll Everywhere* is an online-platform, which enables a large group of people to vote or to give anonymous feedback. In our case, we used it for gathering students' reflections on the research questions. Their statements have been projected in real time for everyone to see. The simultaneous gathering of statements enabled the instructor and students to see the qualitative results immediately, which changed the mode of engagement with research questions from an instructor-based activity to a collective one. As a consequence, the approach allowed for an open discussion in the classroom. Studies on the research-teaching nexus support an active participation of students, arguing that they 'are likely to gain most benefit from research, in terms of depth of learning and understanding, when they are also involved in research, for example, through various forms of active learning, such as inquiry-based learning' (Healey, 2005, p. 67). Students' reflective statements were collected via the e-learning tool and served as the basis for a qualitative evaluation of the course. Because the teaching took place in the disciplinary context of design, students projects were also been analysed according to project name, main foci and format or medium. The analysis of students' evaluations and their design proposals form the basis for the results on reflexive learning. The author of the current paper is the main course instructor.

This course was held for international master students in their first year at the Danish university system, and the course was a novel introduction to the design curriculum. This course was chosen as a case study because it offered the possibility to balance methods, theory and practical assignments without prioritising one or the other, allowing for an investigation into how students reflect on how the pedagogy supported their learning. This paper includes material from two years of teaching the course. The participating 56 master students are majoring in fashion, communication, textile and industrial design and come from Austria (1), Belgium (1), Canada (2), Cech Republic (1), China (4), Denmark (7), Finland (3), France (5), Germany (5), Hungary (2), Island (1), Italy (9), Japan (1), Lithuania (1), Pakistan (3), Poland (3), Spain (1), Sweden (3) and The Netherlands (3). The course's length was 12 days, and there were three main assignments (Table 1).

Table 1: The Course Structure.

Course Elements	Learning Activities	Time Frame
Assignment#1 Intuition	Lectures, Group work, Analysis of own design projects, Designer Theatre, Methods Map 1	2 Days
Assignment#2 Reflection	Lectures, Group work, Readings, Visualising theory, Methods Map 2	2 Days
Assignment#3 Reflexivity	Lectures, Group work, Skype interview, Hospital excursion, Methods' Café, External lectures on SDM research, Brief in SDM, Feedback workshop	8 Days

Course Elements

Assignment#1 Intuition

The course started with an assignment that valued students' personal style, roots and approaches toward design. Following the idea that scaffolding and developing an awareness for an individual social, philosophical and anthropological meta project can be enabled by knowing about one's own history and achievements, students paired up and analysed their

favourite past projects. The first assignment was a mapping of those design methods that students use already. Through interviewing each other, design methods from their favourite projects were elicited. The analysis of all interviews formed the basis of the collective design methods map, where the teams described and drew their favourite methods on cards (Figure 1).



Figure 1: Methods map number one.

The interview structure covered four main themes: methods from design practice, necessary or favourite skills, collaborative aspects in design and students' own design processes. Questions included the following: Which design challenge did your favourite project address? Which methods did you use in which design phase? Which skills have been the most important for carrying out this project? What did you learn from this project. What have been your favourite tasks? Did the described projects involve third parties? (e.g., colleagues, stakeholders, makers, etc.) What worked well, and what did not? Finally, the assignment asked students for an illustration of their typical design process.

After interviewing each other, students prepared their findings for *Designer Theatre*.ⁱⁱ *Designer Theatre* is an alternative way of presenting design positions. Therefore, interview findings were used as a basis for images and learnings that students wanted to share at the symposium. Each student prepared a slideshow with four images, one for each of the methods: design practice, necessary or favourite skills, collaborative aspects and design process. During the theatre, students presented either their own slideshow or that of their interviewee, with a one-minute theatre per image (Figure 2).



Figure 2: The Designer Theatre.

Assignment#2 Reflection

The second assignment targeted readings from contemporary design research. In pairs, students read one of the texts on design approaches from speculative design, empathic design, inclusive design, design anthropology and design-driven innovation. Students extracted the main points of the text and translated them into a visualisation of their analysis, a concept of a designerly way of teaching design theory (see, Bang, Gelting, & Friis, 2014; Cross, 2001; Friis & Gelting, 2014; Oxman, 1999). Students' work was guided by questions regarding content and the form of the text, such as the following: Is there an underlying question that the author investigates? How might you criticise the text? Has something been left out? Are there any inconsistencies in the argument? Are there any specific methods described in the text? How does it relate to your own experience from design practice? How could the approach be applied to shared decision making? How might you visualise the main points and insights for others to see?

The assignment emphasised that design-related skills are helpful for a comprehension of theory and should be used to a greater extent. Additionally, peer-to-peer learning was emphasised. Students taught their text insights in a non-hierarchical way, including providing a reflection of their own design practice. The theoretical content of the texts offered students' intellectual perspectives and stimuli beyond their intuitively chosen methods and approaches. Although the text on speculative design and design fiction (Dunne & Raby, 2013; Mattelmäki Vaajakallio, & Koskinen, 2014) points to productive utopias and what-if questions as tools for the critical designer, the paper on inclusive design (Clarkson & Coleman, 2015) envisioned a future of design diversity with products and services designed for the entire population instead of only for the able bodied and young. The text on social innovation (Manzini, 2014) discussed the process of change from the perspective of a creative re-combination of existing assets. The text on design anthropology (Fulton Suri, 2011) points to the strength of designers seeing something and being inspired by it. The text on incremental and radical innovation (Norman & Verganti, 2014) argues that technology and meaning transfers are a means for innovation. The text on co-creation (Sanders & Stappers, 2014) discusses new roles for designers and frames this idea by pointing to a development from co-designing toward a collective design practice. Besides posters with visualised theory, a second collective design methods map was set up, where teams described and drew inspiring methods on cards (Figure 3). This methods map was a reflection and discussion of the potential approaches for their SDM brief.



Figure 3: Methods map number two.

Assignment#3 Reflexivity

The third assignment fostered active learning via the practical application of design methods and centred on the following research question: How can we make sure that patients and relatives are more involved in medical decision making? This brief is based on evidence from various clinical areas showing that patients want to be more involved in medical decision making. In this specific Danish context of our collaboration partner, a baseline study at Vejle Hospital finds that one out of five cancer patients have not been involved in treatment decisions to their requested extent (Olsen et al., 2013a, 2013b). Based on the data, supporting the participation of patients and relatives is a main design requirement, but there is a range of other areas in need of design exploration too. For instance, initiators of the UK NHS-based Magic programⁱⁱⁱ emphasise four main elements for successful SDM: practitioner skills, patient activation, decision tools and measurement. Practitioner skills include a successful structure of a doctor–patient meetings, such as the awareness of a choice, options and talk about the decision (see, Elwyn, 2012). One example for patient activation is the NHS campaign *Ask Three Questions* (NHS). A further improvement of decision tools would form the most typical design task while measurement would include a stronger integration of systemic issues, including national guidelines.

For this third assignment, students were free to target any of the previously mentioned fields. A research project targeted at collecting empirical data from students' own lives (see, Dohn & Dolin, 2015, p. 55) complemented the practical brief. Each student was asked to conduct an interview on medical decision making with a person from his or her own network (a patient, a doctor, a nurse, a relative of a patient, etc.). The focus of the interview was on the interviewee's experiences with sharing medical information. For greater cultural diversity, students were asked to schedule a skype meeting with an informant from their home country. The semi-structured interview focused on an everyday medical encounter and included questions such as the following: Think about your last medical consultation; please describe the situation. How was information shared? What went well? What could have been done better? Are you familiar with the concept of shared decision making?

In cross-disciplinary teams, Assignment#3 was targeted toward applying design methods to a distinct design challenge in SDM. Students' independent team work started by investigating the situation via an excursion to our cooperation partner, Vejle Hospital, a hospital specialising in cancer care. Since 2014, a newly established Centre for Shared Decision Making, situated at Vejle hospital has aimed at implementing decision tools, skills and other elements of shared decision making in a local setting. Insight into the status quo of shared decision making and a tour through the hospital provided students with first-hand insights into the field of shared decision making and decision aids. Students were invited to use the DSKD Methods Cards Collection (Friis^{iv} & Gelting, 2014) as their main source for the design methods but were also introduced to a number of other method collections, such as the digital collections designingwithpeople.rca.ac.uk/ and dschool.stanford.edu/ or *75 Tools for Creative Thinking, Ideo Methods Cards*, as well as publications such as *Universal Methods of Design* (Hanington & Martin, 2012). Via exploration of the DSKD methods cards 'Collaborate', 'Collect' and 'Comprehend', as well as students' own methods maps number one and two, SDM was investigated in more depth. Students also conducted research and explored the research design of their prospective project (e.g., which methods could be useful for the excursion to the hospital?). Based on their design research, a specific challenge within the field of SDM was identified and developed into their first design ideas and prototypes that could support patients' and relatives' involvement in medical decision making.

Analysis of Course and Design Proposals

The acquired data rest on knowledge from the design proposals, student evaluations and analysis and observations from the course instructor, that is, the author of this paper. The limitations of this research, such as the context of a design methods course in a cross-disciplinary setting rather than a wider scope of design courses, are discussed in the methodology section. The following analysis is viewed as a basis for further research into corresponding teaching formats.

Course Evaluations

New Learnings through Looking Back

Students evaluated their first assignment the day after its completion. Four understandings of design methods stood out: the power of people in the design process, the similarity of methods throughout the different study lines, new methods unknown to the students before and a heightened awareness for their own ways of working. Ninety percent of the students' responses reflected a greater awareness for their own process and methods. In the following sections I am using selected, anonymous student quotes collected via the previously introduced tool *PollEverywhere*:

Thoughtful way to look back and see what kind of methods work in what situation and which do not. Normally, you continue with the next assignment and forget about the previous product. By looking back, you can learn about yourself.

It was interesting to gain insight into the two different design processes my team mate and I had and how we approach design.

A third of the students reflected on the significance of the user's voice, either by mentioning methods related to it such as conducting the interviews or by pointing out the power of people. As remarked by one student: 'The user has (most of the time) the most knowledge about the product'. And another student said 'The user can change the process itself'. Although the class structure was cross-disciplinary, many students noted that the methods that their peers used were similar:

The processes were very similar despite the various methods. Many people use the good basic methods such as sketching, desk research and mood boards. Other familiar methods to me were, for example, the user analysis and the idea board.

We seem to all use more or less the same methods. The range is rather small.

However, more than a third of the students also discussed new methods that they learned from their peers through the exercise:

It helped broaden my horizons to the approaches I could take.

The free play technique was new, which uses different items with a constraint of time to generate several different solutions. It helps, in a way, to widen your scope of research.

Added Value through Contextualisation

The second assignment was targeted toward a contextualisation of students' own intuitive approaches to a design project. After reading contemporary design research, students were asked to extract methods and approaches they were inspired by. In relation to the first assignment, which was directed toward students' own ways of working, this assignment fostered a connected and critical way of thinking about a design brief. Students' own

evaluations after completing the assignment emphasised three main learnings: a wider perspective on design methods, an enhanced understanding of the differences in design methods' movements and empathy tools for the manifold stakeholders. Although the methods wall from assignment number one singled out particular methods, the methods wall here showed more awareness for stakeholder groups and external audiences as recipients of design projects and thus design partners. Students stated the following:

It helps me to think more about users and customers to participate in the design process. I need to explore what to design, not only how to design.

It helped me to structure my ideas and values, to put the right words on it. I also learned from this global point of view, the different perspectives of innovation (from top or down) and the consequences of these different approaches.

It helped reorganise my thoughts and structure the way I thought about and approached research.

In the course of the evaluation, students also reflected on which methods and approaches could be used for their design brief in SDM. Students feedback included:

The idea of not just considerate patients as users, but as persons, as partners. By asking them about their pain and their current issues, we get access to inspiration and solutions to help them to achieve their hopes and goals.

Working as a mediator using existing elements in the hospital and the ideas of the staff and to get a good overview, it is nice to talk to people from every field, and how they think about the problems. In this way, you find more solutions for a problem.

I would like to use the methods that consist on being somebody else, to step into the shoes of another person.

Although the readings were balanced in terms of being user-driven and speculative, fiction-based design approaches, more than two-thirds of the respondents chose a user-centred design approach.

The Reflexive Application of Methods

The third assignment targeted the practical application of design methods to make a brief in SDM. In the two courses analysed, students worked in six cross-disciplinary teams, aiming to come up with design proposals. After completing the assignment, students analysed this assignment in relation to design methods and pointed to the importance of practical applications in collaborative settings:

It was very interesting because we learnt how to develop a project in a team using all the methods that we got to know during these weeks.

Starting the practical application was the moment to actually understand the methods.

Group work was very interesting and eye opening with people from various backgrounds and different working methods. We had to think about our methods rather than using them just intuitively like we are used to.

The twelve projects themselves gave clear indications that students were able to apply learnings, work in cross-disciplinary teams and come up with challenging, new proposals within the short time frame of one week. The following section shows an overview of the projects' foci (Table 2) and discusses three re-occurring themes in more detail.

Table 2: Project Foci.

Project Name	Main Focus	Format/Medium
<i>Lillebaelt Support</i>	Self-help forum for patients to connect with each other and clinicians	Smart phone application
<i>Your body your choices!</i>	Supports patients struggling with being 'active patients'	Analogue brochure
<i>Ethical Understanding</i>	Support individually appropriate consultation style	Bag
<i>Shared</i>	Information sharing website with a clinician and patient section	Website
<i>Logbook</i>	'Diary' that accompanies patients through their treatment, started by doctor and complemented by patients and relatives	Analogue book
<i>What if?</i>	An exhibition about shared decision making, critically reflecting on the concept	Exhibition

Year 2

<i>Memo</i>	Records medical consultations for distributing clinician's information to relatives. That way family and kin are kept up-to-date with relevant information.	Recorder and Cloud System
<i>Child Booklet</i>	Enables children to share feelings and symptoms in a clinical setting	Analogue brochure
<i>Info+</i>	Draws on neuroscientific knowledge to introduce cognitive training to cancer patients	Card set
<i>Shared Decision Making</i>	Prepares patients for the consultation	Analogue brochure
<i>Health Key</i>	Device that enables cross-national access to a patient's medical history and helps patients organise their patient journey	Device and app
<i>Let's Talk</i>	Conversation enabler tool, set in the context of Pakistan's and China's healthcare systems	Smart phone application

An analysis of the twelve projects shows that they fall into three main groups: preparation tools, sharing support and meta projects. The means chosen are diverse, with four analogue brochures or books, three digital proposals such as websites or apps and five projects that suggested alternative formats such as a bag, a health key, a card set, an exhibition or an interior object.

‘Preparation tools’ such as *Your body your choices!* (Figure 4) suggest more responsibility for the patients and proposes a more structured way for preparing patients for medical appointments. This specific project was largely inspired by one of the team’s interviewees who dared not to ask upfront questions. But projects in this category also point to the diversity of patients and the fact that not everyone wants to participate in SDM. In this context, the projects address the influence of personality and character traits and argue for respecting the individuality of care preferences (Mol, 2008).

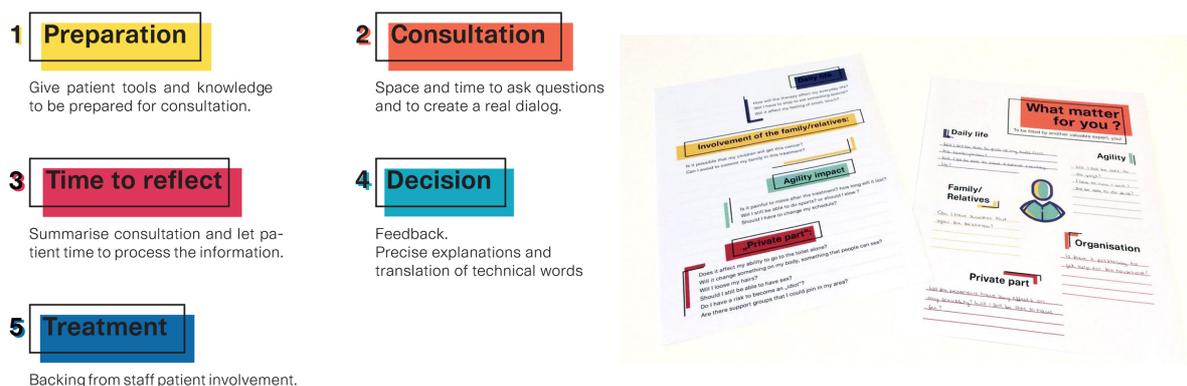


Figure 4: Your body your choices!

‘Sharing support’ is facilitating dialogue between the diversity of stakeholders involved, especially between clinicians and patients. Although some projects concentrated on a further development of patient groups through storytelling and a more informal sharing of experiences, projects such as *Child Booklet* (Figure 5) asserted that information from different perspectives needs to be compiled to gain a more complete health status and enable better informed decision making. This specific project broadened the scope of patients by focusing on children’s needs.

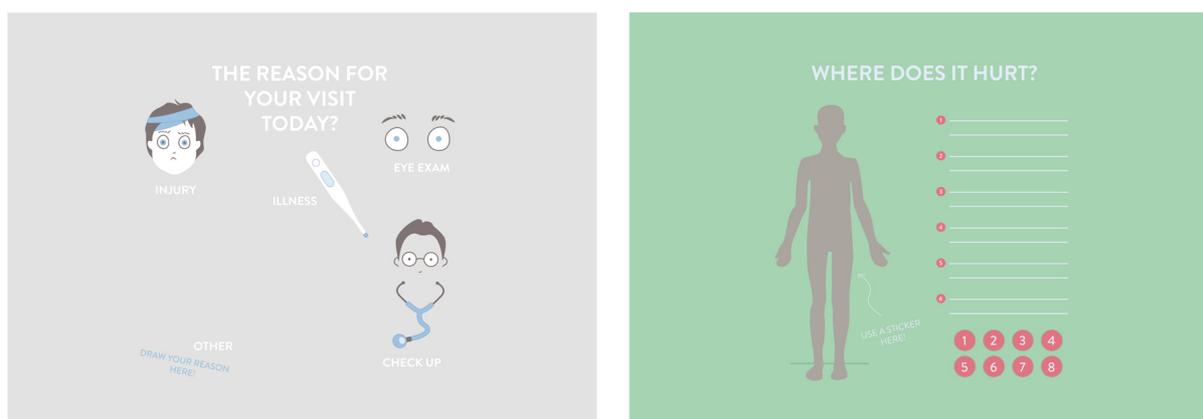


Figure 5: Child Booklet.

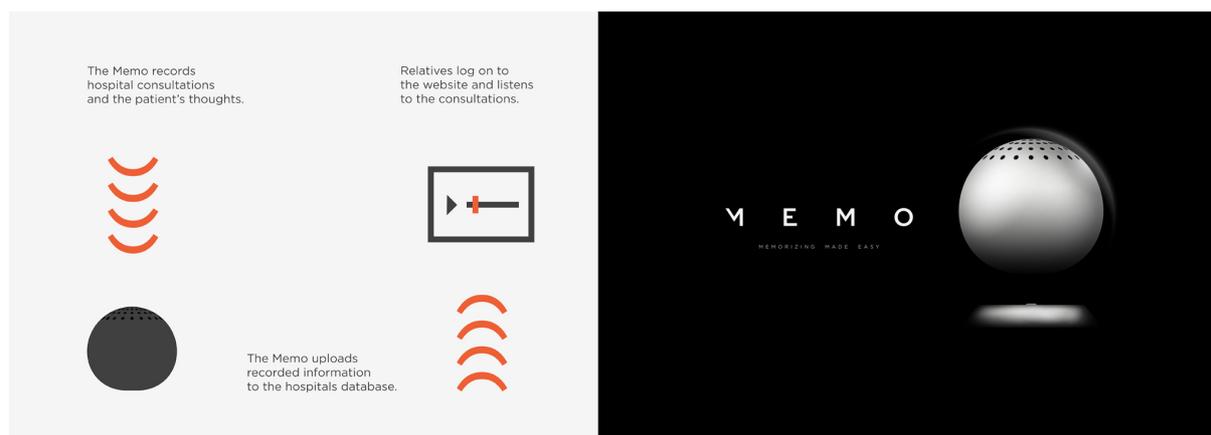


Figure 6: Memo.

'Meta projects' offered proposals on the periphery of SDM, claiming that the interior of consultation rooms, cognitive training for patients or creating awareness for patient democracy in the form of an exhibition could support the overall subject and are possibly needed first to enable the core processes of SDM. *Memo* (Figure 6), for example, does not address the decision-making process itself but argues that an intuitive recording system may release the burden of informing relatives after a consultation and might thus support the patient's family network. The recorder invites family members into the decision-making process.

Discussion of Creating Dialogue, Safe Conversational Spaces and Addressing Diversity

The three assignments supported a balanced learning about design methods and enabled a scaffolding of students' insights. By targeting students' intuition, reflection and reflexivity, the course supported students' individual and collaborative searches for a critical, informed approach to design. Students' design proposals addressed what reflexivity calls for: a participatory dialogue, acknowledging the unfeasibility 'of standing outside our experience and observing it, simply because it is we who are participating in and creating the experience, always with others' (Stacey, 2012, p. 112). Their projects supported the voice of the patients and the patients' relatives by giving them options and possibilities to document individual experiences, jot down questions and encourage personal narratives. This is in stark contrast to many existing shared decision-making tools that concentrate on the medical options and leave little space for the emotional and personal aspects of the illness. Another aspect addressed by the proposals was the goal of creating a safe place for interaction. Although the Internet was frequently mentioned as a space-enabling interaction and a place where information can freely flow, it was also regarded as a highly unsafe place by the student teams. Thus, their concepts promoted a safe and curated room for interaction and information exchange. The fact that every patient acts and copes differently with medical information is a further aspect that was approached by the proposals.

In respect to the design pedagogy, the findings from the course impacted the initial hypothesis on what might work for students. One crucial finding is connected to Assignment number one, Intuition. It was expected that analysing a favourite project would create a wider discussion around individual practices, including a meta level of purpose and scope. It succeeded in creating this discussion for some teams but could have been better supported by framing the assignments' purposes more directly. Questions should include *why* a student chose that specific project as his or her favourite and *what* that choice reveals about individual professional responsibility and design ethics. The case study's argument for a stronger linking

of methods, theory and practice asserts that cross-disciplinary approaches are compulsory to support students' development as critical design thinkers who are able to contextualise their own practice. This attitude of working with a research question and relevant literature also resonates with von Humboldt's claim of the role of a university in general: 'It is furthermore a peculiarity of the institutions of higher learning that they treat higher learning always in terms of not yet completely solved problems, remaining at all times in a research mode' (von Humboldt, 1810; Elton, 2001, p.45). Because design education acts within higher education programs, design pedagogy should be in line with this claim.

The limitations of this study are due to the focus being on only one type of course in design, which represents a small section of the design curriculum. Further research is required in other courses to support the conclusions in the current paper. A further limitation concerns the fact that the author of this paper is the main course instructor. This practice is common in design education research, lacking the resources for external observing researchers. The likeliness of a bias needs to be considered.

Conclusion

This paper uses the case study of an experimental design methods course to discuss the effective intersection of intuition, reflection and reflexivity in design teaching formats. The three different assignments integrated individual experiences, contemporary design research and the application of design methods to a socially relevant brief in shared decision making. For the first assignment, students interviewed each other about their favourite projects and intuitively used methods. By choosing the most significant and striking visuals that told the personal design story well, presentations were turned into the *Designers' Theatre*. This required director and curator skills, key communication competences for designers-to-be. The second assignment was targeted a critical review of the readings from contemporary design research. Via visualisations of the readings and peer-to-peer learning activities, potential methods for approaching the specific brief in SDM were discussed and elicited. The third assignment fostered a practical application of the design methods' learnings. Again, cross-disciplinary group work emphasised fast peer-to-peer learning in terms of the methods' usability in design practice and a critical reflection of the results found.

Design learning for today and tomorrow should acknowledge the ways in which design is implanted in the social and political level and how it delivers goods, services and experiences. To cater to this complexity, a design curriculum that unites the various levels of learning, rather than dividing courses into different strands, should be further explored. Critical thinking should advise design and form finding; the present paper proposes research-based teaching as the foundation for a reflexive design practice. Teaching should consequently integrate design research, pointing to the role of future designers as articulate professionals who aim their design at a common good. Improving life and the world also needs a substantial 'real world' component that offers fields of application beyond the commercial sector. Design academies fostering solid collaborations with welfare institutions such as hospitals not only offer multi-layered training fields for future designers, but also promote a contemporary idea of a designer's work fields. This paper consequently calls for more advanced studies on corresponding teaching formats that enable design students to connect with research in a way that is meaningful for them and that informs design practice.

Acknowledgements: The author would like to thank the international first-year master students 2015 and 2016 at Design School Kolding for their enthusiasm, critique and feedback.

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ⁱ Rittel and Webber argue that planning problems are not to be compared with “tame” problems in science or engineering. Due to their societal character they are “wicked”, meaning that the definition of the problem is at the same time the solution. The authors name examples such as the reason for poverty. Is it low income, deficiencies in labour skills, spatial dislocation, cultural deprivation? “The formulation of a wicked problem is the problem! The process of formulating the problem and of conceiving a solution (or resolution) are identical, since every specification of the problem is a specification of the direction in which a treatment is considered. Thus, if we recognize deficient mental health services as part of the problem, then – trivially enough – ‘improvement of mental health services’ is a specification of solution” (Rittel and Webber, 1973, p.137).

ⁱⁱ The format is inspired by the *Architektentheater* introduced 1999 by Viennese architects in the context of the architecture biennale taking place in Budapest and Vienna. The format enables a parallel assessment and comparison of different positions on one and the same topic, while traditional project presentations perceive each design and position as an enclosed entity (Dankl, 2015, p.5).

ⁱⁱⁱ MAGIC stands for 'making good decisions in collaboration' and is a Health Foundation implementation program for shared decision making that has been running in Newcastle and Cardiff, UK.

^{iv} This paper uses the term design in exactly this broad way, to signify that it is no longer restricted to specific areas of application but discussed as a means to address the whole complexity of product-service challenges.