RESEARCH DRIVEN DESIGN EDUCATION

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ABSTRACT:

Recent developments in design profession towards more abstract challenges and broader responsibilities together with an organizational change put School of Design at University of Art and Design Helsinki into a situation, where a new design research agenda was needed. The agenda prioritized design research into three areas: user centered design research, research on domestication of design, and cultural design research. By doing that it also defined an alternative model to the traditional material and product category based organization of design education. The agenda has been implemented through project planning, recruitment and communication. Several indicators show favorable development in the prioritized research areas. It appears that the agenda has contributed to a process, where the traditional loop of design competence gathering and transfer through immersion in practice has been successfully complemented with a research loop working through active knowledge generation.

1. OBJECTIVES

The purpose of the paper is to share our experiences in developing design research and research based design education at School of Design, University of Art and Design Helsinki. We will describe our research agenda development work from 2003 to 2006, recognize some of the reasons that led us to create a research agenda, describe changes in design research during that time frame, and finally discuss the meaning and impact of a clearly defined design research agenda. The point of view in the paper is one of insiders, as the authors bore the main responsibility for research planning and administration at the School of Design over the reported period of time. We present the Helsinki experience as a case study rather than a model for other schools. However, at the end of the paper, we will consider what other universities can learn from our work.

2. STRUCTURAL FACTORS BEHIND THE NEED FOR A RESEARCH AGENDA

School of Design (see http://muotoilu.uiah.fi/) at University of Art and Design Helsinki is a traditional design education institution with roots in art and craft based education. The school that later became University of Art and Design Helsinki was founded 1871 and got university status in 1973. The first doctoral degree was achieved in 1990.

The School of Design, which is one of the six schools at the university, was created in the beginning of 2003 by merging several material and product category based design departments, i.e. departments of Spatial and Furniture Design, Textile and Fashion Design, Glass and Ceramics Design, Applied Art and Design, and Product and Strategic Design (previously Industrial Design). After the merger, the previous departments continued their existence as undergraduate and master level degree programs. The School of design has about 600 students, and more than half of them are on postgraduate level. The number of faculty members is about 30.

One of the most salient reasons for the merger was to create a bigger unit that would be able to develop international collaboration and design research practices. In Finland a covering network of polytechnic level design schools was created over a short period of time during 1990s and the university realized an opportunity to change its profile more towards research and postgraduate education. As the government invested more in design education, it also saw research as an important component in making education more responsive to market demands and changes in technology (esp. Korvenmaa 1998). Also a demand for more conceptual design understanding from the industry and other sectors of society, and related change in the design profession was recognized (Valtonen 2007). Designers had started to be involved in strategy work, in more intensive collaboration with other professionals and growing design education itself needed professionals

with conceptual skills. Traditional professional practice based loop to update education contents was too slow and too tied to local operational level design expertise to respond to the challenges the university had. Research by actively scanning international design community and participating the development of emerging design approaches, models and theories, was seen as the solution to create a second loop for knowledge generation (see Figure 1).
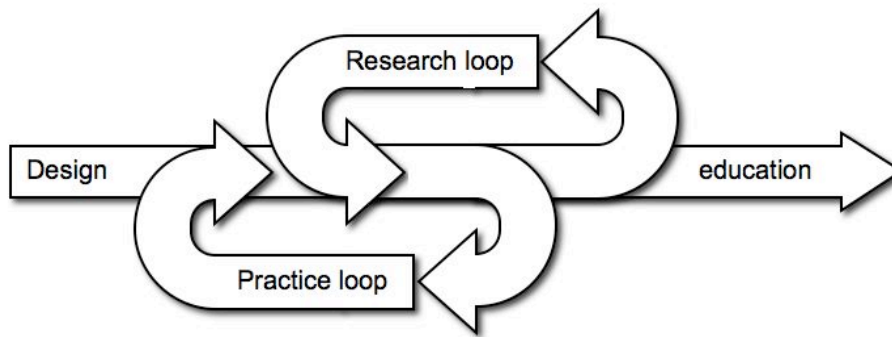

Figure 1: Two loops of updating design education: the loop through immersion in professional practice and the loop of design research. The loops are not completely separate as research loop explicates and contributes to the practice.

Some of the units in the new School of Design had previous research experience, especially industrial design and glass and ceramics design, which had had two well-functioning research groups already during1990s, but the School of Design as a whole was not a ready research unit at the time of the merger. First, the research interests were extremely fragmented. The school had a large pool of about 60 doctoral students with a very large variety of research topics ranging from inorganic chemistry via method development for interaction design to projects in the interface of design and fine arts. The students had very few common topics or shared research interests, as their research questions, methods, relevant research communities and cultures were all different. The school was not able to provide individual researches forums to reflect their thoughts or even to get adequate practical advice. Some of the students found communities to support their work outside of the university from technical universities for instance, but many felt alienated and several quit their studies.

Second, the school had a lack of research tutoring expertise. Out of the about 30 faculty members, 12 of whom were professors, only three were recruited based on research merits. Others were chosen based on their professional qualifications – or artistic as the official term is – and did not have much or any experience in research. In addition, as design research was still in pioneering phase and by the time of the merger only seven design related doctoral defenses has been seen in the country, there were no postdoctoral researchers to participate the tutoring and project planning. This led to a situation where many of the doctoral students

had to work without any, or at least any committed, supervision. The shortage of senior researchers had also a reflection on research resources in the Finnish system where the majority of research funding had to be applied from university external sources. There was only one functioning research team with a team structure and funding that ensured the continuation of research and accumulation of skills over individual projects and researchers. The other one that had existed during 1990s had dispersed in the lack of funding.

Third, there were big differences between the programs in their maturity of design research. Some units had succeeded to gain some initial research experience and merits during 1990's while others had not even started to seriously consider research as part of their responsibilities. This created some suspicion and internal tension into the university and School of Design as research, basic education, and art projects competed of the same resources.

Also some positive signs existed. Design research and researcher education has been started successfully in some units, and there was increasing interest among students and design professionals towards research, which was for example indicated by the quite high number of enrolled doctoral students. University administration had founded a university level unit, Research Institute, to support departments in doctoral education. The university has also been active in preparing a design research policy accepted on government level called Design 2005 (Saarela 1999). As an important part of the policy design research programs had just started funded by Academy of Finland and Finnish Funding Agency for Technology and Innovation Tekes, funding basic and applied research respectively. These programs had allocated a substantial amount 30 million euros of government and corporate funding for design research to be used over the following five years. The program agendas clearly underlined the importance of cross-disciplinary approaches in design research and, thus, forced School of Design to profile itself as a credible research partner if it wanted to participate the programs.

Summing up, in the beginning of 2003 the newly founded School of Design had very favorable external preconditions for becoming a credible research unit. The biggest challenges it had were internal and needed to be solved by the unit itself. One of the responses to these requirements was to create a research agenda that was far more systematic than previously.

3. TOWARDS A RESEARCH AGENDA

In this situation with the challenge set by changes in professional competence demands and reorganization of design education sector; the opportunities provided by the new organization, funding programs and

administrative support; and the problems being mostly internal, it became obvious that a research strategy aligning the efforts and focusing available resources was needed. The traditional material and product category based structure of design education could not be used for planning design research as it did not offer concepts for identifying the common nominators between design departments not to speak about partners outside of the university. On contrary, the traditional structure, built on the differences between design branches such as the specific materials, maintained fragmentation, interest conflicts and rigidity in resource allocation.

In planning the new structure for design research we recognized several angles that had to be acknowledged. First, the agenda had to give design research a direction, which is relevant scientifically. In practice this meant discarding the interpretation of design and artistic creation as such being equal to research, or design exploration without any further criteria qualifying as academic research. Second, the design policy resolution (Saarela 1999) set expectations on the impact that design should have on competitiveness, quality of environment and vitality of culture. Several other administrative documents outlining the social and economical expectations towards design and design education had also been published (for example Korvenmaa 1998, Nieminen and Järvinen 2001). These did not give specific guidance concerning the content of design research. However, they underlined the importance of regarding design as a phenomenon connected with industry, society and economics, and consequently obsoleted the idea of design research focusing only on the operational level of design, i.e. design work and problem solving within the design community. Third, the research agenda had to respect to a reasonable extent the multitude of interests in the School of Design and in the university as a whole. As discussed above, this was a major challenge, because design is a multifaceted discipline. It is linked to cultural history, marketing, consumer decision-making, business strategy, production and material technologies, product development methods and processes, consumption and user behavior, psychology and sociology, architecture and urban planning, and fine arts. These were not just hypothetical examples, but all those fields were represented in the scope of research projects at School of Design. In addition to agreeing on what is relevant for the design research unit internally, the agenda had to pay attention to the research interests in other units of the university and academic institutions to avoid unnecessary overlap but to enable mutually beneficial collaboration. Fourth, the structure had to be realistic and pay attention to the available resources on short and middle term. The estimated future availability of competent people and turnover of faculty positions at the school gave a framework for the scale, speed and direction of a possible change that could be implemented. Fifth, on the most practical level the research agenda had to be a tool for clearly communicating the content of research, to focus the development activities and resource allocations.

A series of workshops were organized during autumn 2002 where existing research interests, future insights and expectations were discussed and iterated towards an acceptable structure. As the result of this work a research agenda was outlined and in the beginning of 2003 accepted in the steering group of the School of Design. The agenda included the following five focus areas 1) User centered design research, 2) Strategic design research, 3) Applied material research, 4) Cultural design research and 5) Research on living environment. In addition to the agenda, other decisions concerning design strategy were made, but the discussion about those is omitted here.

User centered design research, built on previous work in what had been by then known as the Smart Products Research Group (SPRG), included method development on design for user experience and user centered industrial design, accessibility and domestication of technologies. This area had been the backbone of design research at the Department of Product and Strategic Design and had a solid project base thanks to the practical relevance of interaction research in industry, especially in communication technology. School of Design had also been a partner in a cross-disciplinary master level user centered design education program called Usability School (see www.soberit.hut.fi/kaytettavyyskoulu/tietoa/usabilityschool.html), which created a good foundation for building research collaboration in Helsinki capital area between design, computer science and cognition science departments.

Strategic design research focused on linking design and business management. It aimed on one hand at studying the organizational aspects of design such as developing design competences and creating models for design subcontracting. On the other hand it listed the design application of approaches developed in futurology as essential research questions. School of Design had been collaborating with two other Helsinki area universities, Helsinki School of Economics and Helsinki University of Technology, on a master level program called International Design Business Management (IDBM)(see http://project.hkkk.fi/idbm/index.html). Creating research based input for IDBM was seen necessary for the development of the program and thus strategic design research as an important research focus.

Applied material research focus area included studies related to sustainable use of materials and manufacturing methods in design especially with glass, ceramics and fibers. Productizing inventions with new high tech materials such as applications of nano technology was seen also as a promising area of design research and included on the agenda.

Cultural design research was a large umbrella headline for a variety of research interests related to humanistic research tradition. Especially historical development of design professions, design history, and cultural differences in design were recognized as relevant questions. There were also an amount of projects at the

School of Design exploring with alternative models of research on the interface of fine arts, personal creative work and academic discussion, which were set under this umbrella.

Finally, research on living environments covered to a set of research interests related mainly to housing, mobile work and mass customization in apartment building. The projects in this area, conducted by a separate unit, Future Home Institute (see http://wiki.uiah.fi/futurehome/), were close to consulting, and creating a more solid foundation for research was regarded necessary.

The list of five areas with their subcategories was clearly a compromise between catering for everybody's interests and what was realistic to implement considering the available resources. Some of the items listed were based on existing and developing activities, while others reflected more intentions, insights and even wishes about the future development of design research. The resources available were known to be insufficient to support the whole portfolio, but the agenda managed to prioritize a set of research areas and gave alternative structure to the material based old model of design education. The agenda was used to communicate School of Design's research interests (see http://designresearch.uiah.fi/), competencies and intentions to the external audience such as funding agencies, but perhaps more importantly to the internal audience. The agenda was also used for allocating resources. School of Design, for instance, employed postdoctoral researchers and external experts to develop those areas on the agenda where the lack of competent faculty was severe and to plan projects and collaboration networks. In other words, they functioned as development managers in developing research linked to applied arts and mapping relevant knowledge on the material sciences.

4. REALITY CHECKS

During the four first years of implementing the agenda reality started to influence the structure. On some areas development efforts were fruitful and the strategy on paper turned into active research and research results, while other interests did not start to flourish. Through a series of annual updates presented to the university administration as a part of the budgeting process the agenda evolved. The number of focus areas decreased to include the ones with existing research groups, project funding, flow of publications and academic theses. The rest of the interest areas were still recognized as worth attention, but did not share the same status as the first group (see Figure 2).
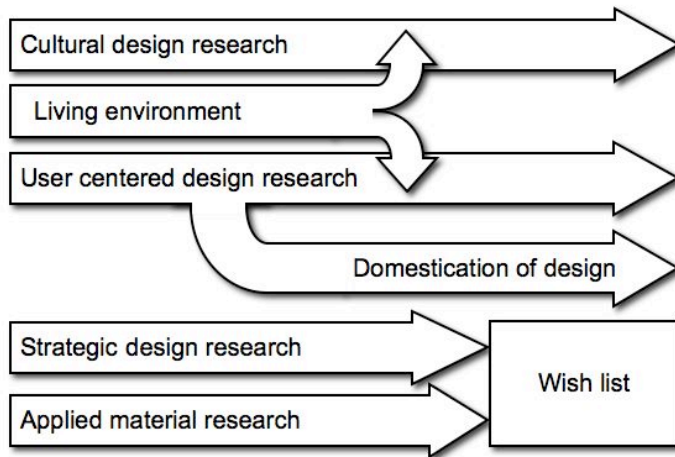
Figure 2: Changes in School of Design's design research agenda from 2003 to 2006.

User centered design research continued to enjoy support from innovation funding agencies and industry. The projects have included topics such as self-documentation based user studies (Mattelmäki 2006a, 2006b), utilization of digital video in user centered design (Yliriskü and Buur, forthcoming), user centered concept design (Keinonen and Jääskö 2004, Keinonen and Takala 2006), the changing role of design in the development of ubiquitous environments (Kaasinen and Norros 2007), design for all (Leppänen 2006), user centered development of real estate maintenance work (e.g. Mattelmäki & Lehtonen 2006), and applying gaze bath studies for design evaluation (Räihä et al. 2006). There have not been any clear guiding theoretical frameworks to align the research, but the applied methods, user experience and user centered design community have provided a common ground for the projects and researchers to collaborate. Domestication of technologies is in many respects close to user centered design research, but with its more rigorous theory foundations in sociological interaction research, domestication literature (Silverstone 1992) and much looser links to practical product development context, it has been recognized as a new focus area of its own. Domestication projects have dealt with adoption of high tech products such as mobile image communication (Battarbee 2004, Kurvinen 2007), but also with more traditional design objects (Grönman 2005, 2006). Cultural design research focus area has produced doctoral dissertations about design professions and their development (Valtonen 2007), design history and intercultural effects related topics (e.g. Fang 2004, Sorainen 2006) and art led design research (e.g. Mäkelä 2003, Summatavet 2005, also Mäkelä & Routarinne 2006).

Strategic design research and applied material research dropped on a wish list for several reasons. In particular, there have not been senior faculty members leading the research work on these areas. Also, some members of the faculty have, if not opposed research, pursued other agendas that have typically been based

on artistic thinking. Third, job openings in the faculty still tend to be based on immediate educational needs on traditional basis rather than on research-based merits. There are individual researchers with often very interesting projects working on these areas (for instance Siikamäki 2006, Hakatie and Ryynänen 2007), but the lack of structures to ensure continuation and accumulation of expertise pose continues challenges to creating a truly research-based agenda for strategic design research and applied material research.

5. IMPACTS AND CONSEQUENCES

Design has got a lot of favorable attention in Finland in the beginning 2000s due to the actions taken based on the government design policy resolution. Thus, assessing the implications of a relatively small action, defining and following a research agenda at a university department, needs to be seen in this bigger context. In addition to the positive development of design in the society, certain kind of maturing of the research culture at School of Design would have most probably taken place without the definition of the agenda. Consequently, the impact of the agenda is difficult to assess. However, if we pay attention, not to the development of design research and its impacts as such, but take a more focused view on the areas of design research where the progress has been the most visible, it seems that we can conclude something about the agenda's influence. With this point of view in mind we will take a couple of different perspectives to the possible influences of our design research agenda, which are 1) immediate results of design research at School of Design, 2) utilization of research results in education at School of Design, 3) the every day presence of research at School of Design, 4) curriculum development at School of Design, and 5) recognition of the design research done by School of Design.

A significant increase in the volume and productivity of research has occurred at School of Design. A comparison between four-year periods before (1999-2002) and after the merger and agenda introduction (2003-2006) gives some indication about the right direction: the amount of doctoral defenses before and after has increased from three to fourteen, 10 of which have worked on the priority areas. Corresponding figures concerning the annual research funding are approximately 300 000 euros and 1 000 000 euros. Majority of the funding (approximately 75%) has been on the three focus areas. In terms of content, the School of Design has reached a certain level of maturity: it produces about four doctoral degrees annually; its faculty publishes roughly one research monograph a year; its faculty and researchers publish about 20-30 refereed publications annually; its faculty routinely evaluates and supervises doctoral work and job applications in other universities in Finland and internationally, and works as experts in devising policy in other countries.

Research projects have created results that have been published as textbooks used both in under and post graduate education at School of Design and elsewhere. The topics include user-centered design and design for user experience (Huotari et al 2003, Koskinen at al. 2003, Mattelmäki 2006a, 2006b, Keinonen & Jääskö 2004, Keinonen & Takala 2006, Ylirisku & Buur, forthcoming), and art led design research (Mäkelä & Routarinne 2006), i.e. follow the agenda alignments. Publishing teaching material based on university units' own research documents, accumulates and transfers the expertise to new generations of students. This is an obvious method of transferring expertise in all traditional university faculties, but design has lived surprisingly long in a visual and oral culture, where knowledge and skills have only been transferred through examples, spoken language and immersion.

The presence of research at School of Design has become more visible. Interaction between researchers and students has increased as researchers' have taken a stronger role in teaching and tutoring. The presence of researchers and the examples they provide make career opportunities in research a viable alternative for students. Research projects provide students opportunities to join research groups during their thesis projects, which again is normal practice in universities, but can be seen as a major step compared to the pioneering phases of design research, when every single new research student had to build the whole research environment and network from the scratch. The presence of researchers, their tutoring work, and the working opportunities in research projects has had an impact for example on the orientation of students' thesis topics towards more research driven design approach especially on the focus areas.

School of Design updates its curriculum every second year. In the update done 2007 the structure of design research, i.e. User centered design, Domestication of design, Design and culture, Strategic design and Applied material research, will be implemented to master level education starting from those areas where the research culture is the strongest. The new structure will aim at creating a matrix where students can combine traditional design skills with research driven approaches and insights. Implementing the structure to cover the whole School of Design will be a major effort, but already commitment to it is a valuable internal recognition towards the work that researchers have done.

Design research has recently been clearly acknowledged by Finnish innovation and education system as mentioned above. Finnish Funding Agency for Technology and Innovation Tekes has founded a new technology and research unit focusing on design, usability and digital content, which lists user centered design as one of its key support areas. Ministry of Education has recognized design research by its decision to fund a five-year doctoral program, Design Connections Graduate School (2007-2011), which focuses on the impacts of design on culture, consumption, and user centered innovation. Finally, the government of Finland has included a

project merging University of Art and Design Helsinki, Helsinki School of Economics and Helsinki University of Technology on its agenda for coming four years. The main drivers for the project are the defragmentation of university structures in Finland and creating stronger cross-disciplinary research and innovation units capable to compete internationally to support industries in innovation. Interestingly the role of University of Art and Design Helsinki in the planned university is to contribute with its expertise in human centered innovation as recently stated by rector Yrjö Sotamaa (2007).

Presently it seems that the eager response to design research creates a surplus of demand. There is more need for design research than School of Design can realistically deliver maintaining reasonable quality standards, even though the research education has developed substantially. There is a growing risk of odd research that may spoil the reputation of the unit.

6. DISCUSSION

School of Design defined in the beginning 2003 a research agenda, which has by the early 2007 evolved to include the following main focus areas: User centered design research, Research on domestication of design and Cultural design research. Based on the discussion above, we can conclude that the development of design research and its impacts have been significant on the prioritized areas. The discussion above does not, however, prove or even suggest any causality. The agenda might have had a positive influence on the development of design research, or perhaps it only managed to anticipate some areas where the research turned out to progress well. Probably both claims are true to some extent simultaneously: the agenda has been a tool to anticipate research areas with the best opportunities and it has functioned as a tool to focus attention and efforts to create research results.

Currently, many issues are driving design schools towards a more traditional, research-based university structure. For the most part, these reasons are political and related to securing resources. However, at the School of Design, research has been built on more proximal grounds: it has been a response to new realities posed by the merger rather than to more distant factors.

The prioritizations lined by the design research agenda have taken School of Design towards the normal academic mode of building and transferring expertise. The traditional loop of design competence gathering and transfer through practice still exists and will remain as a corner stone of the education, but now also the research loop working through active knowledge generation has taken off on the priority areas. These two loops together ensure that the education is grounded on professional practice and transfers tacit knowledge; it

keeps the repertoire of skills provided relevant from the point of view of the industry, updates the education content based on emerging international practice and generates new insight. When leaning solely to the practice loop the role of the university has been a vehicle to transfer practitioners' expertise to novices. The research loop allows the university to take a proactive role and provide the professional practice with new well-justified insight and approaches.

This article is a study of a special case rather than something that can be adopted in other universities directly. Many features that have supported research at the School of Design are no doubt unique to the school and the University of Art and Design Helsinki. The university has had rights to grant doctoral degrees since 1983, and had produced several doctorates by late 1990s. When the government created two major design research programs in 2000-2001, the university was ready to seize the opportunity. However, many other reasons are not specific. For instance, the industrial design program of the School of Design had supported research from mid nineties as a way to gain legitimacy in the prevailing craft and art ethos, and had hired professors with a science university background, aligning the School with such well-known examples as the Ulm school and the British design research movement of the 1960s, not to mention design programs in technical universities and media labs. Also, Finland was not the first country to create a design policy aligning design with a strong research agenda, aiming at linking design into industrial policy. For example, Denmark had a fairly similar program even earlier, but its programs still have a primarily craft orientation. Rather, it is the combination of factors and the university's belief in research that are important factors – and replicable elsewhere.

In a new field of research such as design research, people look for models, examples and structures to what the content of design research could be. Temptation to wait and see how design research evolves and trying to be interested and involved in everything is real. However, a design research unit committing to an agenda gives understandable content to the vague and fuzzy concept of design research. For us design research has been method development in user-centered design, research of domestication and an umbrella of cultural research studies. We have been able to construct a successful research agenda, and to embed it into the very foundations of the School of Design. Most likely the agenda will change in the future, but if the existing one works as a step ahead, it has fulfilled its function. Even with its peculiarities, the School of Design provides an example of how a traditional design department can build a research program into its very foundations.

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