INTERNATIONAL CONFERENCE ON ENGINEERING AND PRODUCT DESIGN EDUCATION
6 & 7 SEPTEMBER 2012, ARTESIS UNIVERSITY COLLEGE, ANTWERP, BELGIUM

THE NORDCODE NETWORK: A SCANDINAVIAN APPROACH TO DOCTORAL EDUCATION IN DESIGN

Martina KEITSCH
Department of Product design, Norwegian University of Science and Technology

ABSTRACT
Artefacts play an important role in culture and society and contribute to how we see, interpret and communicate about the world. However, scientific knowledge on how these artefacts are designed, interpreted and used is still undeveloped in the design community and research on design and its implications on individuals, culture and society still forming. Discussing the topic of knowledge generation and dissemination in design on a doctoral level, this article presents experiences from the Nordic Network for Research on Communicative Product Design (Nordcode). Among other activities, Nordcode has organized joint seminars for doctoral students between 2004 and 2008. One goal of the PhD seminars was to enable discussions on on-going research, facilitating the development of new research methodologies and the training of PhD-students. Following the introduction, the second section of the article introduces the Nordcode doctoral seminars and discusses contents, results and organization form as collaborative, non-competitive approach to doctoral education in design that allows PhD students to get feedback on their research. The third section appraises forms of knowledge generation and dissemination in the seminars with help of examples, in order to motivate educators to develop new forms of cooperation across European borders. Conclusively, section four illustrates possibilities for novel PhD curricula and indicates future tasks connected with a common PhD education in the design disciplines.

Keywords: PhD curricula in design, interdisciplinary exchange, knowledge transfer, generation and dissemination of research, Scandinavian and European cooperation

1 INTRODUCTION

Scandinavian publications are gradually emphasizing the need for doctoral education in design curricula as e.g. the report 'The Future in Design' states: "The Nordic design education system is almost entirely devoted to educating students at undergraduate and Master levels. At present design institutions and departments are, relative to other academic disciplines, seldom focused on research and development. Architecture tends to fare better and have much higher rates of research and many more research students but is still low in research compared to other disciplines." [1]
Even if the fundament for theoretical or methodological research in the design field is still modest compared to other parts of the world, and research is often conducted from the perspective of art history in Scandinavia, studies also document a growing attention of both practitioners and design academia for new epistemological approaches in doctoral education. Dunin-Woyseth and Nilsson [2] point e.g. out that knowledge issues in design have to be reconsidered, regarding the relations between design disciplines, scientific requirements and academic environments.
In the last ten years, research outputs such as publications, reports and project disseminations from the design field increased in the Scandinavian universities and higher education institutions too. Cooperation is however vital for these institutions for at least for two reasons. Firstly cooperation advances the rather sparse activities in PhD education in design at University Colleges and secondly it improves synergies in research by connecting young researchers with each other and seniors through common curricula. Initiatives from universities in Scandinavia to initiate common PhD curricula are also likely to contribute to improved quality of research, from mere tool, case-based and cook-bookish approaches and publications to a wider design discussion including e.g. reflections on the role of design and designers in society. If one considers design education analytically as consisting of three knowledge types: professional-, cultural- and common sense knowledge, the goal for basic design education is certainly establishing and stabilizing professional knowledge with support of the other

knowledge types. However one can expect that a candidate at a doctoral state already has stable professional knowledge and that hence the goal for post-graduate education is re-locating professional knowledge within a wider socio-cultural context, thereby enabling the PhD candidate to reflect on the ontological, epistemological and methodological conditions and developments of his or her design topic [3].

Aiming at encouraging critical reflections, unbiased discussions and new ways of comprehending design theory and practice, the Nordcode network represents a transnational approach to meet challenges connected with the variety of issues design research is facing. The network was established in 2000 by researchers from the Scandinavian countries, Finland, Sweden, Denmark, and Norway to meet the needs of a growing design research community and has since organized activities such as research cooperation, information exchange, workshops and PhD seminars, documented by a series of publications [4]. Nordcode is a "society-like" research network, organized and managed by a steering group that meets 2-3 times per year. Today, the steering group consists of Dr. Toni-Matti Karjalainen, Aalto University, Finland, PhD Viktor Hjort av Ornäs, Lund University, Sweden and Dr Martina Maria Keitsch, Norwegian University of Science and Technology. The network is open for researchers and doctoral students with interests in the topic of communication in product design. Nordcode's Annual seminars have been a main discussion forum for the design community. In addition to the Annual seminars (2004-2012), joint seminars for doctoral students have been organized from 2004-2008.

2 CONTENTS, RESULTS AND ORGANIZATION OF THE SEMINARS

The objective of the PhD seminar series was to support doctoral students within design research in Scandinavia by providing them with an arena for discussing their ongoing research projects with peers and senior academics. The focus was on developing the students' research design and methods, and on enhancing their argumentation and reasoning skills. In addition, the seminars aimed to encourage collaborative projects between Nordic universities. One seminar series consisted of three seminar meetings, organized for example in the following way:

- 1st doctoral seminar: NTNU in Trondheim, November 8-10th 2006
- 2nd doctoral seminar: Chalmers in Gothenburg, March 7-9 2007
- 6th Nordcode Annual Seminar & PhD workshop, Helsinki, June 6-8 2007.

The Annual Seminar run from 2003-2012, the PhD series from 2004-2008. The PhD seminar series took place in various Scandinavian institutions among others: Technical University Lyngby, Denmark, Norwegian University of Science and Technology, Trondheim, University of Art and Design, Helsinki, Finland, Oslo School of Architecture and Design and Roskilde University, Denmark.

2.1 Contents of the PhD seminars

The PhD seminars series were held annually and comprised of three seminar meetings, each from 2-3 days. One PhD seminar validates 7.5 ECTS credits. To qualify for this, participants must prepare for each seminar meeting through literature studies, attend all three seminars and complete compulsory assignments including peer reviewing. The PhD seminar meetings consisted of lectures on topics within communicative product design and of focused discussions about research and methods. Much time was devoted to discussions around the participants' own projects. The 2-3 seminars supplemented each other thematically and culminated in the final seminar, which was simultaneously either, a part of a *working meeting* or of the *Annual seminar*. There essays written during the seminars were presented there in order to get feedback and to stimulate interest for new research approaches within a larger audience.

2.2 Results

The doctoral students came from various academic backgrounds such as universities, design schools and colleges, of which some had own PhD education programs while others graduated their students externally. This created an exciting but also challenging learning environment and exposed the participants to comments of quite different national and Scandinavian design scholars and their views on design research. Additionally the Annual Nordcode seminars were attended by European researchers. Each year between ten and fifteen students were admitted into the PHD seminar after an individual application procedure.

2.3 Organization and further work

Nordcode has been created to fulfil the needs of a small but growing design research community. The network is concretely characterized by activities based on research cooperation, doctoral education, information exchange, workshops, seminars, and publications [5]. The Annual Nordcode seminars are the main discussion forum of the community. In addition, follow up seminars for doctoral students and common research activities in the area of product design are planned from 2014 onwards. The network requires a good deal individual enthusiasm and personal engagement by the researchers involved, not at least related to time and efforts to organize and participate in the PhD Seminar series. However, the close cooperation between the researchers resulted in great spin-offs, that would be rarely possible otherwise, such as the development of a common PhD education in product design and several publications in scientific journals, not to mention the personal synergies between colleagues, the pleasant and uncompetitive atmosphere in the seminars and the administrative and competent help, when looking for new opponents, course evaluators, and lecturers for design curricula in the institutions. According to these spin-offs and the positive feedback from the participating PhD candidates, the Nordcode network feels that it has a strong future potential, also with regard of expanding and participating in e.g. Marie Curie or NorTech initiatives.

It was of course a great advantage that NordForsk provided the economic means for the Nordcode network from 2004-2008 to finance travel costs for students and to conducting the seminars and we appreciate this greatly. Additionally to the organization of the Annual seminar in June 2012 in Helsinki and Stockholm, the steering committee applied for new funding in March 2012. Some financial support from the participating institutions is already provided this year, however planning and organization is facilitated immensely by monetary continuity granted for a longer period in the years to come.

3 KNOWLEDGE GENERATION AND DISSEMINATION: SOME EXAMPLES FROM THE NORDCODE SEMINARS

Knowledge generation in doctoral design education and its endeavour to meet a variety of interdisciplinary issues from engineering to aesthetics, sustainability and stakeholder requirements can be labelled with what Rittel and Webber called a “wicked problem” [6]. Design research has to draw on knowledge from many fields. It is not possible to find one coherent paradigm or an everlasting theory. This may be an advantage in many cases, but it also comes with challenges, especially if researchers are not aware of what kind of theories they adopt. Distinctions between design and science have as well been widely discussed in the field [7]. Most experts agree that because of the wide range of applications (from words, images and other visual media to material objects, activities, systems and values) design must draw upon other fields. This ‘hybrid’ scientific character of design as a discipline between practice and theory and a resulting undecidedness to submit to basic or to applied research makes it difficult to develop specific epistemology for design. Not having its own epistemology also creates a need to adapt and transform methods suitable for design research. For these reasons design has to explore and modify methodologies. Moreover, the current training of design practitioners often makes it difficult for them to present research results within the traditional academic dissemination channels. The ‘language tools’ of other research fields (e.g. quantitative data in the natural sciences and qualitative argumentation in the humanities) are not always appropriate in communicating the information designers have and are interested in, e.g. the visual qualities of artefacts.

Facing such challenges the Nordcode network represents an attempt to bridge the gap between design research and theory and design practice. Its focus on communicative aspects in product design is both topic and programme - aiming at generating, disseminating and mediating knowledge in design theory and research and assembling young researchers to exchange information, competence and skills, thereby providing access to important Scandinavian design knowledge resources. As a collaborative, non-competitive approach Nordcode allowed participants to bring forward ideas in a preparatory stage and get feedback and advice on their research design. The advantage of this approach to improve work in progress, compared to today’s academic system that encumbers alteration since research is typically reviewed by peers at a completed stage. Feedback is given here on results but comes too late to affect the actual planning and data collection processes. By encouraging peer discussions at early stages Nordcode supported new research. As topics from PhD candidates in the seminar below illustrate, the network allows for critical reflections and the discussion of novel ideas that may turn out to become significant future contributions to the field:

2007, Kyle Kilborn, "*The Patient as Skilled Practitioner" (PhD Graduation 2008, University of Southern Denmark)*
Summary: In Gibson's (1979) theory of perception, an organism directly perceives the value of the environment through affordances. By affordance, Gibson means the opportunities or possibilities of nature, which require the act of information pickup. Within design theory, however, there is a strong tendency towards separating perceptual information of affordances and the affordance itself. Combining a literature review with an empirical case study of a medical device, we suggest there is untapped value in the notion of direct perception and argue that there is meaning through doing. Looking at the role of affordances over time, instead of a person's first exposure to a product necessitates sensitivity toward enskilment and how people create meaning through the use of products.
2008, Jon Olav Eikenes - *"Navimation exploring time, space and motion in screen based interfaces" (PhD Graduation 2010, Oslo School of Architecture and Design)*
Summary: There is an increasing need for better interfaces for sharing and accessing media content. These interfaces should be useful, as well as experienced as enjoyable and engaging, satisfying a diversity of user needs. The PhD project will design new interfaces as well as contribute to the ongoing discourse of defining the area of interaction design. It will centre on analyzing navimation in the interface as a cultural and mediated construct that is connected to underlying technologies.
2008, Sofia Hussain - *"Design for aid and development, designing prosthetic legs for disabled children in Cambodia" (PhD Graduation 2011 Norwegian University of Science and Technology)*
Summary: The project aims at getting better understanding of how the analytical and creative skills of designers can be used in projects for disabled people in developing countries. The research will focus on finding efficient ways of including primary and secondary users in the design processes to comprehend all user-needs and create a notion of ownership and commitment in local stakeholders. The Know Your Product Method will be further developed and used to improve trans-tibial prostheses for children in Cambodia. The research will be a contribution to getting improved overall knowledge about how to organise successful design processes for development of appropriate technology for developing countries.
2009, Elin Olander –**"**Design as Reflection" *(PhD Graduation 2011, Lund University Sweden)*
Summary: The project investigates how young adult users with disabilities experience their assistive devices. It describes how design can contribute to solve conflicts between an unwanted product and the desired identity of the user. In depth interviews and participatory design processes have been carried out.

4 PHD EDUCATION AND NETWORKING ON A EUROPEAN LEVEL

Considering doctoral education in design, the author agrees partly with Margolin, who asserts that many locally developed PhD programmes exists but what lacks is a common guideline."…most new programs appear to be devised locally without reference to others elsewhere. ."[8]
Even if it seems difficult to reach a standardized doctoral education in design theory, the debate on appropriate teaching methods has to continue, possibly moving in least two parallel directions, an epistemological discourse on design theories, their epistemological heritage, development so far, their diversification in different design fields and their relation to other disciplines as well as their reflections to actual topics in the design field, society, culture art etc., and a pragmatic discourse on approaches that motivate PhD candidates to integrate theory into their practical design work. In case of Nordcode the first direction concerns discussions on semantics in design, communication between different stakeholders, theories of visual interaction etc. and the second the development of clearer methodologies to connect theory and practice for through research by design [9] or project grounded research [10].
The design research field in Europe is comparatively undeveloped compared to other academic disciplines. Because of this, there have been limited possibilities for arranging PhD-seminars focusing on communication in product design such as design semantics, visual language, and mediation of professional design knowledge to companies and public stakeholders, and novel research methodologies. A design research network on a European level could take on the challenge of conducting PhD seminar series on such topics, bringing together leading experts from the relevant areas of design research and young European researchers.
Furthermore, a European network could work on strengthening the connection between theory and practice and contribute to bring about new ideas, approaches and knowledge for different actors in the

design field. In this way, interplay between design practices on the one hand and knowledge and research on the other hand can be greatly enhanced. The network can also benefit practitioners with limited time and means to assess emerging methods that are competing with each other.
Within a European context three networking activities can be particularly relevant for collaboration:

- address common problems and research questions
- initiate creation and consolidation of new design theories, tools, and practices
- strengthen the links between scientists, artists, and designers in the European communicative design research area.

The proposed cooperation activity in Europe would have the objective to link researchers, designers, business and public actors through the working-titled theme ***"Communication in-through and -by product design"***. A kick-off initiative could be to establish an interactive platform for knowledge exchange and -generation. This platform would enable different actors to share scientific and practical knowledge on ongoing research- and innovation activities progressively and can also include case studies and best practices and would form the fundament for common development of PhD education in design research. In the medium to long term advancing design research creates the foundation and climate for innovation, technological and social development in all European countries and has an enormous impact on industrial and firm level competitiveness as well.
Design departments and institutions with a strong research environment tend to having better curricula and broader interaction scales with external academic as well as public stakeholders than those with less research. Research work and dissemination of insights and results, not at least at doctoral and postdoctoral levels are particularly important – these candidates are future design educators and decision-makers. Moreover, research related to European design industries can greatly enhance our understanding in which direction the industry and business are heading, what challenges design faces in terms of international competition and what types solutions design can provide for society and users. Conclusively, even if funding for research and curricula in design tends to be a national issue, there seems much to gain by joining forces and sharing resources and this article hopes to have presented an onset for a discussion on why and how to proceed with design research cooperation.

REFERENCES

[1] The Future in Design Research Team. *The Future of design, Final report*, 2004, p.28, accessed 2.2.2012: www.artun.ee/popFile.php?id=57. The terms "Scandinavian" and "Nordic" are used simultaneously in this article.

[2] Dunin-Woyseth, H., Nilsson, F. Building a culture of doctoral scholarship in architecture and design – A Belgian – Scandinavian case, *UK Council for Graduate Education and Middlesex University*, 2009, pp. 24-26.

[3] Keitsch, M. and Hjort, V. Felicities and Fallacies of Teaching Design theory, A comparative study, *International Conference of Engineering and Product Design Education*, 6&7 September 2012, Artesis University College, Antwerp Belgium.

[4] An overview of activities of the NORDCODE-network can be found on http://www.nordcode.net/?page_id=818, accessed 12 May 2012.

[5] Reports: Design communication, 3rd Nordcode Seminar & Workshop, Lyngby, Denmark April 28-30 2004, Semantic & aesthetic functions in design, 2nd Nordcode Seminar & Workshop, Helsinki/Espoo, October 1-3 2003, Conference working papers: 5th Oslo seminar (06/03) Books**:** *Design Semiotics in Use,* Edited by Susann Vihma http://www.nordcode.net/?page_id=301, accessed 15 May 2012.

[6] Rittel H.W. and Weber M.M. Dilemmas in a general theory of planning, *Policy Sciences*, 1973, vol. 4(2), pp.155-169.

[7] E.g. in: Buchanan, R., Margolin, V. (ed), *Discovering Design: Explorations in Design Studies*, 1995, Chicago: University of Chicago press. Cross, N., *Designerly Ways of Knowing,* 2006, New York: Springer. Krippendorff, K., *The Semantic Turn: A New Foundation for Design*, 2005, Boca Raton: CRC Press. Margolin, V., Buchanan, R. (ed), *The Idea of Design, A Design Issues Reader*, 1995, Cambridge: MIT Press. Stolterman, E. (2003), *The Design Way*, 2003, Englewood Cliffs, NJ.

[8] Margolin, V., Doctoral Education in Design, Problems and Prospects, *Design Issues*: Volume 39, Number 3 (Summer) 2010, pp. 70-78.

[9] Frayling, C., Research in Art and Design, *Royal College of Art Research Papers*, 1993, Vol.1,

No1, pp1-5.
[10] Findeli, A., Rethinking Design Education for the 21st Century: Theoretical, Methodological and Ethical Discussion, in: *Design Issues,* Volume 17, Number 1 Winter 2001, pp. 5-17.