STRATEGIES FOR TEACHING UNIVERSAL DESIGN

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ABSTRACT
This paper presents a framework for teaching the complexity of Universal design (UD). At the Institute of Design at Oslo school of Architecture and Design (AHO) the theme Universal design is introduced in the second year in a five week module within the course User oriented design. The philosophy behind the module is based on an inclusive design process focusing on involving people with reduced capabilities. The paper describes a holistic model of teaching Universal design and presents essential elements in an inclusive design process. Examples from students' work are shown that aim at designing products that are appealing and offer a desired identity. Conclusively, the discussion part of the paper reflects on the needs for universal design curricula in general and on challenges and improvements for the user oriented design course at AHO in particular.

Keywords: Inclusive design processes, social sustainability, appealing product

1 INTRODUCTION

Universal or inclusive design is a philosophy and characterized by the Institute for Human Centred Design as: …"a framework that accepts *diversity* of ability and age as the most ordinary reality of being human" and it revitalizes "design as intrinsic to *social sustainability*" [1]. According to Eikhaug inclusive design "…aims to design mainstream products, services and environments that are accessible and *attractive* to the largest possible number of people" [2].

Although UD has become a major premise in many design projects, teaching this social and inclusive approach in design courses is relatively rare and is only to be seen in a few curriculums of the universities around the world [3].

Challenges are here to set goals for Universal design, to develop models, methods and pedagogic strategies to approach these goals and to meditate this rather complex area to design students.

This paper presents experiences from a course which explored a new proposal for teaching Universal design. It discusses a holistic model of approaching the essential elements in an inclusive design process and illustrates examples of students work in an experimental course module. The two student's projects shown are dealing with the design of walking sticks that have the intention to give positive connotations and to be attractive to use. Reflections on how and what to teach in UD curriculum will conclude the presentation.

2 TEACHING UNIVERSAL DESIGN AT AHO

The mission of the Institute of Design at the Oslo School of Architecture and Design (AHO) is to do teaching, research and dissemination within the disciplines of product design, interaction and service design and design management. The institute is aiming at being commercial, responsible, experimental and discursive.

To become a professional designer one has to have theoretical knowledge, practical skills and professional experience. The students are taught that to gain theoretical knowledge, they must know the vocabulary, terms and concepts of the actual field, how these concepts are related to each other and a method telling the steps and tools in the actual design process. To be useful for the students this more or less abstract, theoretical knowledge must be applied and concretized into practice. The project work in the courses is intended to take care of this practical part.

2.1 The course user oriented design

Teaching the philosophy and strategy of Universal design is a 5 weeks module in the 18 weeks third semester course called User Oriented Design, valued 18 ECTS credits. The course as a whole is an

introduction to the discipline of ergonomics, a discipline where theories and practicality of Universal design have been a crucial part of the curriculum the last 10-12 years.

In the actual 5 week module of the course the student's task is to apply the theory, methods and tools of Universal design in a practical project. The main goal of this module is, besides giving the students the philosophy and principles of UD, also bringing them the attitudes and the way of thinking and acting in this field of design.

The overall pedagogical aim of the teaching in this module was to give the students tools and attitudes to find inclusive, innovative, *appealing solutions* to the user's needs, wishes and requirements. Essential in the student's project was to build in aesthetic values of symbolism and affiliation in their solutions.

2.2 A holistic model of user oriented design

Based on the author's experiences of teaching design students for about 30 years, there seems to be a tendency that most students in their first years of studying like to place their work in a moral and ethic context. To motivate and challenge them and to give an overview and understanding of where their work can fit in to a broader picture, a holistic model showing relations between value driven traditions, methods and characteristics of the resulting product is introduced. The following hierarchical model was developed by the author to explain the internal relations between the concepts:
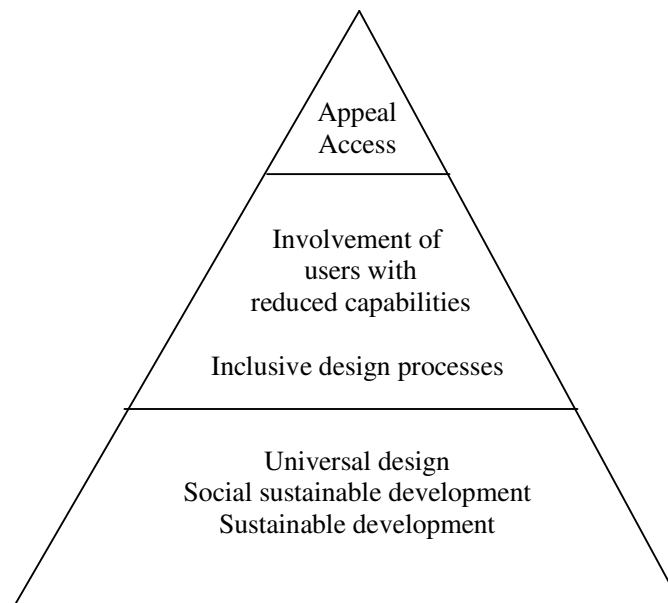

Figure 1. A holistic model of teaching Universal design, showing value driven traditions (base), methods (middle) and characteristics of the resulting products (top)

Before turning to the course description and discussion, a short summary of the elements in an inclusive design process is given in the following section.

3 ELEMENTS IN AN INCLUSIVE DESIGN PROCESS

Universal design is claimed to have common goals like inclusion, access (to education and information) and participation. To reach these goals students are taught the philosophy of an inclusive design process that *allows for iterations* and *involve end users and stakeholders* [4]. Based on the model from John Clarkson's et al. [5] and ISO 13407: 1999 Human-centred design processes for interactive systems, the following steps were identified by the author as the key elements in such an inclusive design process:

Table 1. Elements in an inclusive design process

Stage	What	Why	How
1	Specify the context of use	To identify the setting for user requirements and the evaluation of usability	Describe who will use the product, to what and/or how they will use it and where
2	Discover, understand and translate the wants and needs of the users and stakeholders	The understanding of the real physical and emotional needs is crucial for profitability and desirability	Use tools and techniques like interview, observation, questionnaire, research kit and workshops
3	Identify, adapt and apply standards, guidelines and checklists into requirements	There is a jungle of official and other laws and recommendations in the field of Universal design	Ask qualified persons in the actual area. Search in relevant standards and on internet.
4	Evaluate conceptual designs against requirements and test with real users	An iterative design process is based on testing prototypes and modifying the solutions again and again	Set up and plan for test with users. Perform user trails and evaluate with end users and stakeholders

4   DESCRIBING THE COURSE

The 23 students in this particular course were introduced to theory, methods and tools in the field of UD (see above). Their initial task in the first week was to read and give a two pages summary of relevant literature and to identify, describe and argue for three universally designed products. Then they were given the following task description of the project:

Design a simple, innovative handheld product where the power of the arms is used for support and propulsion. The product shall be inclusive. As end user you have to choose user with reduced capabilities like elderly, people with arthritis, people with reduced vision ability, wheelchair users or others. A crucial element in the project is to build in and describe symbolic values like affiliation and identity.

In the second week their first task was to choose their end users, establish contact and identify their needs, wishes and demands to handheld simple products for support and propulsion. The students were told to make agreements with their users for meetings and other involvements in their projects.

At the end of this second week the students should individually present and argue for their choice of user group, their user's needs and wishes and display three conceptual ideas for products. The last three weeks they worked out their concepts in mock ups and models and made presentations.
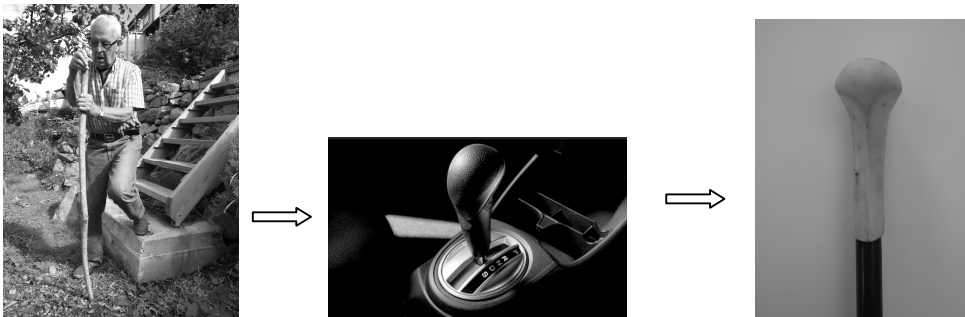
5   EXAMPLES OF STUDENTS' WORK

The two chosen students' works with walking sticks below show one important intention of the course module: to focus on how to design appealing products. The resulting products express the importance of these values of symbolism and affiliation for the users with reduced capabilities. The solutions are aiming at products that enhance the social status for this user group.

Below are shown some parts of two 2nd year students' work: Mikkel Brandt Bugge, example 1 and Alexander Ruud Kondrup, example 2. The resulting models of sticks are seen to the right in both series.

EXAMPLE 1

EXAMPLE 2

Figure 2. Examples from students work with product identity and affiliation in walking sticks.
From left to right: User studies, aesthetic inspirations, sketch and models of the products

Example 1 covers the design of a walking stick that draws on cultural traditions of form in the Norwegian society. The stick has a fresh, natural and living expression, are suggested made of wood and recycled rubber wheel material for a better grip and can be folded to put into a sack or bag for transportation.

Example 2 draws on more contemporary automobile inspired forms. The resulting model is searching to be appealing, symbolizing quality and safety. Its length can be regulated for different sizes of people and context of use.

6   REFLECTIONS

Any sciences and field of knowledge has its system of concepts, so also Universal design. Concerning strategies for educators the model in Figure 1 provides a good starting point for a holistic view into this philosophy of design. The model gave the students a possibility to understand how different elements are or could be related and was a starting point for questions and discussions. It links main concepts like sustainability and universal design to methods like user centred design and user involvement. The top of the pyramid reflects two important characteristics of products that claim to be inclusive; they must be physical and mental accessible and have positive aesthetic connotations appealing to the user.

How to design, the design process itself, has lately been emphasizes in design education and are indeed deciding for the result. The specified elements in the inclusive design process that was given, in Table 1 secured a systematic way of working, focusing on involving the end user in the development of the product.

The decision that every student has to take contact with and bring a person with reduced capability into their project proved to be successful. For some students it was a challenge to take such a contact

since they did not know any with reduced capabilities, but after some efforts they all managed to find and bring such a person into their project. There were also students who shared a common user. Bringing in a real end user during the whole project period seems to be stimulating and motivating and in some projects it was a source for creativity and innovative solutions. The user involvement forced the students to design for the needs and requirements of others and gave them a valuable and different perspective than when designing a product for themselves and their own user group. The intention was to develop the student's empathic sensibilities and user insights through this exercise.

Another positive experience from the course module was the open form of task description of the project that was given to the students, see earlier in this paper. It widens the possible concepts and seems to be a good a way of stimulating innovative solutions.

However, the most challenging aspect of this experimental course module was the aesthetic one. Some writers have emphasized the importance of the aesthetic expression, creating positive connotation and attractive symbolic values of products that claim to be inclusive [6, 7].

The main question to answer may therefore be: What is an appealing aesthetic expression and how to create positive symbolic values and connotations in these types of products?

To translate positive symbolic values into products was, seen in retrospect, a difficult task to handle for the students, and it surely is an advanced and crucial task - also for professional designers. The illustrations given above are indicative of this. In Example 1 the student was inspired of classic historical forms and forms from the nature trying to achieve a fresh, natural and living expression in his stick. He may be successful in searching for these positive connotations, but for whom and in what context of use will the stick reflect positive symbolic values? Will the old lady he brought into his project identify herself with and feel affiliation to the stick? It depends on the context of use. Being a mountain wanderer or on a pilgrimage the stick will reflect positive values, but not necessary if used in an urban or more formal situation. The context of use is therefore more crucial of how the product is perceived than the aesthetic expression of the product itself.

In Example 2 the student was inspired by contemporary automobile forms. The idea that the resulting handle of the stick is symbolizing quality and safety may be good. However, it got a clear masculine expression. Trying to reach the goal of an inclusive and design for all solution, a more feminine or neutral version is needed.

This paper presented a background and student cases for a Universal design curriculum approach at AHO. If the course module is run again the following suggestions for improvements could be done:

- A new name of the course module: Design for diversity - about contextual sensitivity and empathic user insights.
- Bringing in more concrete examples when explaining an abstract theory model.
- Take away the element in the task description of the project module that the resulting product shall be inclusive, since we are dealing with assistive products.

Just as Universal design requires attention to the needs and hopes of a wide range of users, so also its design pedagogy demands a range of strategies and support.

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