

CHALLENGES IN THE WELFARE SECTOR – SOME EDUCATIONAL PERSPECTIVES

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ABSTRACT

The demographic trend in Europe shows a significant increase of the elderly population. A promising approach to alleviate challenges accompanied by this trend is welfare technology which aims, among others, to extend the time when elderly can live autonomously in their preferred environment and in this way delay the time when they need support from public institutions. However, welfare technology *per se* is enough to face the challenges for supporting elderly in their daily living. A broad approach considering social, economic and ecological dimensions is needed to maximize the success of future developments. Moreover, knowledge generation in the welfare sector is required to meet a variety of interdisciplinary topics - from engineering to aesthetics and social issues, sustainability aspects, stakeholder requirements and user involvement. Following the introduction, the second section of the following paper presents an overview on the Experts in Teamwork (EiT) courses which are mandatory for all Master Students at the Norwegian University of Science and Technology (NTNU). Section three discusses benefits and challenges of the EiT course “Welfare technology” while section four analyses the course as starting point for integrating welfare technology in the Master studies at the Department of Product Design (IPD) at NTNU and discuss impacts of such a course for industrial design students.

Keywords: Welfare technology, experts in teams, Master curricula, group work and cooperation

1 INTRODUCTION

Aiming to enhance professional competence in the social sector among design students, this paper analyses the existing potential to develop an interdisciplinary Master course on welfare technology at the Department of Product Design (IPD), NTNU. The topic of welfare technology and different forms of student collaboration have been explored by the authors within the ‘Experts in Teamwork’ (EiT) framework. EiT is a unique project in Norwegian academia consists of a selection of different mandatory courses offered by NTNU departments for all 4th year students. The main aim of the EiT courses is that the students, through interdisciplinary project work and team-based reflection develop cooperation pattern that lead to positive results. Another objective of EiT is to sharpen recognition of the distinctive characteristics of other academic disciplines and their ways of working. At the same time, the courses are intended to strengthen the students’ own academic identity, through the interaction in the team and the way in which their individual academic competence contributes to the project. The objective of the EiT course on welfare technology is to identify, analyze and discuss key technological, sociological and socio-economic factors that influence the acceptability of future welfare technology developments in a sustainable manner. The results of this course should provide different responsible, acceptable and comprehensive welfare technology solutions and, simultaneously, alter the attitude of students towards interdisciplinary collaboration. For the teachers, the course was also meant to indicate thematic and educational paths of innovation for designing products, services and structures for a sustainable welfare society. The following section presents a brief overview of how the Experts in Teamwork courses at NTNU are build up and how a focus on welfare technology is integrated and combined with the courses aims and organization. Section three discusses the modalities of the 2013 EiT spring course: “Welfare technology” and analyses advantages and challenges for the teachers and candidates. Section four analyses EiT impacts as a starting point for integrating welfare technology in the Master study programme at IPD. The final section reflects about impacts such a course may have on students and other stakeholders. The article is meant as a contribution to the ongoing discussion on how to integrate welfare technology in design curricula.

2 EXPERTS IN TEAMWORK AND WELFARE TECHNOLOGY

EiT is a syllabus where the students develop cooperation skills and gain experience in using their individual academic competence in interdisciplinary project activities. The major objective of EiT is to prepare the candidates for professional practice. On this background NTNU has decided that EiT is to be included in all study programmes at second degree level. The learning method in EiT is experience-based, students work in teams on different projects and the major focus is on cooperation in the team. Students are divided into 'villages' of up to 30 participants and each village is divided into interdisciplinary teams of five to six students. In 2013 we have 74 villages. The village language is either English or Norwegian. Each village is headed by a professor, called the village supervisor. In addition, two learning assistants in each village facilitate the student teams. Each village has a broad overall academic theme related to societal issues or challenges from working life. This theme forms the basis for the student team's project work. The village may have external partners that represent the theme, and that may be advisers and recipients of the students' work. The village themes are presented on the EiT website, and the desired combination of academic competencies in the villages is specified as a guide to help students choose a village. Students submit their preferences for five villages in order of priority. Students are allocated to the villages on the basis of their preferences, the village's need for competence in various disciplines, and the number of places in the village [1]. Figure 1 shows EiT goals [2]:



Photo EiT, Sven Veine

The starting point in EiT is the project work in the student team, from various disciplines. You use your knowledge and experience in cooperation on a joint project. Applying the knowledge that you as a student already have acquired is a focus area in EiT. The intention is that you will gain a new and broader perspective on your own knowledge and how it can be used in cooperation with others.

EiT helps to create a more nuanced understanding of entrepreneurship in education. It is necessary for the student teams to work together with external partners. Specific and relevant tasks increase motivation, at the same time external partners' focus on the results of the student team's project work. External partners and projects relevant for the society may stimulate creativity and innovation in the teams.

EiT provides a unique opportunity for links between external organizations and students pursuing their education. By drawing experience from your knowledge and experience, you should also ask questions about the problem formulations. Such cooperation between student teams and stakeholders in the community has proved fruitful for both parties.

Figure 1. Objectives of Experts in Teams

The main difference of EiT compared to conventional courses is that learning should improve both professional *and* cooperative skills. This is achieved through team-based reflection. To focus on students' attitudes and skills are not usually part of the syllabus in higher education. To release the potential offered by an interdisciplinary team, however, it is essential that the cooperation is functioning properly. EiT aims at the practice of a profession, with the attitudes and skills needed there, while the development of professional and cooperation skills informs each other as fig. 2 illustrates [3].

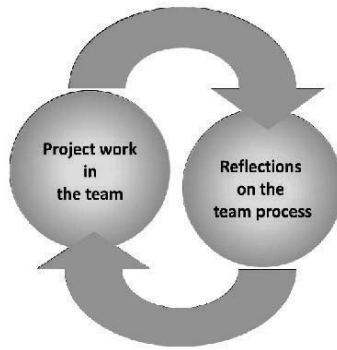


Figure 2. The project work and the reflection on the team process influence each other

Before discussing the particular EiT course at IPD “Welfare technology” in section 3, the following paragraph explicates why interdisciplinary cooperation is important for complex questions such as future welfare and sustainability.

The ‘World Population ageing report 1950-2050’ from the United Nations [4] highlighted with the support of several detailed statistics, that the global demographic situation is expected to change significantly in the next 50 years.

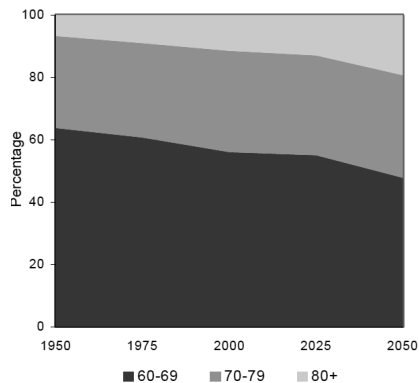


Figure 3. Distribution of population aged 60 or over by age groups, world: 1950-2050

The increase of life expectation will bring new challenges regarding a satisfactory provision of adequate services for public health, social inclusion, etc. One example of this challenging situation refers to the possibility of senior citizens to be fully integrated into society which is often diminished due to the need of constant support and health-care provision. This need strongly limits their freedom, frustrating their natural demand for independence and privacy. Even if, in some cases, there is no real necessity for continuous support, periodical assistance for accomplishing very specific tasks during the day or overcoming sporadic episodes of distress is still required. Very often, the need for support is present only occasionally. However, it may still affect the elder person to live a normal and independent live and to achieve satisfactory social integration. One of the most promising alternatives to meet the challenges of supporting this new elderly population and their need of living longer in an independent manner is envisioned through the support of welfare technology in form of services or ICT solutions. In particular, recent research and development on welfare technology aim to extend the time during which elderly people can live autonomously in their preferred environment. The possibility of living in an independent way is one of the main factors that impact in the perception of wellbeing by people. In particular, elderly people have a high interest in living in their familiar environment (and in many cases totally independently) as long as possible [5].

Welfare technology presents a mean through which elders may extend the time they are able to live by their own in an autonomous way. In this context, the introduction of welfare technologies and the maximization of their adoption among the population will contribute facing the challenge of providing sustainable support for elders to live in their preferred environment. Research has however also shown that the great emphasis on developing technological solutions tend to blur the need for both user approval and –involvement and societal acceptability. Different projects have also demonstrated that e.g. low technology solutions can be as effective and acceptable as high-tech ICT approaches [6]. One step towards understanding the values and needs of the users of welfare technology solutions (elders, relatives, caretakers, service providers, etc) is through open discussions and cross-fertilization of ideas and by placing together stakeholders with different perspectives. The key aspect of this stakeholder-involvement strategy is the ability to facilitate the development of ideas in a group setting. Methods connected with this strategy are e.g. participatory design dialogue and focus groups. Focus groups have been shown to be successful in drawing upon older persons' attitudes, feelings, beliefs, experiences and reaction in a way that would not have been feasible using other methods. Both approaches are occasionally used in IPD curricula yet, have so far not been applied in a systematic and sequential way in a course. A further method, ethnographic interviews can be used to present a set of welfare technology scenarios to the stakeholders, which then will be discussed and analyzed. To study the expectations from the different stakeholders involved in welfare technology solutions means also to focus on the willingness of users to interact with devices situated in the environment, the interaction style (system initiated versus user initiated), the trade-off between system intrusiveness vs. user directed interaction and the different usability issues that rise specifically for users with the particular characteristics of elders. Finally, seniors today are more mobile, better qualified and have a bigger purchase potential as any generation before them. However, to understand the needs of older adults as a business opportunity, one has to know their interests and use patterns of products and services. The illustrations have one denominator in common, which in our opinion most relevant for successful welfare technology - the focus on the user. Designers (and engineers) tend to develop products and services for themselves, mainly because they see the user as abstract entity mediated mainly through statistics and market analyses. And many design curricula are rather lame in their attempts to alter this view.

The EiT program recognizes both the individual student and his or her professional competence and the different disciplinary competences required for holistic solutions. This recognition coupled with the ambition to build a bridge between different fields makes EiT valuable for design courses. The EiT participants do not use only information from each other but their cooperation produces some kind of *synergy*, which in turn can support individual development. The team determines a single focal topic, and shares explanatory goals, theories, methods and strategies specific for solution. As a result all team members can (ideally) be sure the details of the problem formulation and the solution elaborated are well covered. The following section makes an attempt to explain how this works in practice.

3 THE EIT VILLAGE: WELFARE TECHNOLOGY

This following discussion is based on two years of experience with the experts in teams course conducted at the Department of Product design (IPD). In 2011 IPD chose to participate in the program for two reasons. First, NTNU, as a multidisciplinary university, has the unique capacity to turn into a prominent actor for research-based development in 'design for society' including health-, care- and welfare technology. Second, because of its political and economic characteristics, Norway has the potential to be an international pioneer in the development and production of health-, care- and welfare goods and services but this will only be possible through interfacultative cooperation. Thus, we see EiT as a preparation for innovative design and businesses of the future.

3.1 The recruitment of students

On the administrative side, EiT is organized in thematic 'villages' and students make their priorities when selecting an EiT village: Even if the EiT administration wants to compose multidisciplinary groups, they are reluctant to place students outside the prioritized villages. This in turn counteracts the intentions of multidisciplinary cooperation as the students tend to select EiT villages with familiar topics. As an example, most Civil Engineering students end up in Civil Engineering based villages. Welfare technology and Innovation in home-care is a complex topic which makes the initial presentation of the village challenging. In 2013 IPD flagged cooperation with the municipality of

Trondheim, which is a pioneer in innovation and integration in the welfare sector [7]. Additionally, the teachers provided a list of possible projects like: Home automation, Training and Physical well-being, Social networks for elderly, Tracking and GPS technology, Home medication and ICT in the care sector [8]. In retrospective, all these examples emphasize ICT-technology with little focus on the social and economic issues of the welfare challenge. The IPD village recruited 19 students, which is below the normal capacity of 30 students in a village. Twelve of the nineteen students have ICT background, and four students come from the Industrial economics and technology management.

3.2 Development of assignment

The first 4 weeks are allocated to establishing student teams and development of a project brief. It is emphasized that the teams have the responsibility for coming up with a relevant project brief, but the teachers act of course as facilitators and discussion partners in this phase. The current 19 students work in 4 teams. To illustrate the ongoing project development processes, the initial problem statements of the team 1-4 and a justification of their motives for selecting these problems are listed below.

1. We will explore how we can help people with sudden cognitive impairment (such as consequences of a stroke) back to a functional life. We plan to look at both the process of rehabilitation, and the challenge to get back to work.
2. Employees in nursing homes and home care have a challenging work situation, partly caused by ineffective reporting systems. Much of the reports will never be read and with the limited time available, the reports are often incomplete. How can these challenges be handled to ensure a better quality of the reporting and less resource use?
3. We want explore how welfare technology can make life easier for the deaf. In particular we will look at the challenges the deaf meet when pronouncing Norwegian-English words and phrases (where not only the word or phrase is adopted from English, but also the pronunciation).
4. Given the problems deconditioning causes among the elderly, how can we create a motivating form of exercise at home?

The first day of the EiT course was focused entirely on establishing the groups, and presenting the EiT framework. On day two general welfare challenges were presented by an expert. On day three Trondheim Municipality presented their efforts for developing new systems and solutions for homecare and nursing homes in form of two lectures [8]. In spite of the initial focus on the elder generation, three of teams decided not focus specifically on the elderly. The problem statements are focused on a specific user (patient) group except group two which addresses the situation of personnel in a nursing home. This is quite a task, but when the groups were challenged to present their problem statements as a role play, group 2 chose to present a situation with a dement person receiving medication several times because the record keeping did not work. Keeping track of medication is clearly a more manageable task than developing a general system for reporting in a nursing home. Two of the groups have adapted their problem statement to an initial solution concept or a first idea. Group 4 uses the KINECT technology [9] to develop a training application. Group 3 also develops an i-pad application for training pronunciation. According to the students [10] the main benefit of the EiT approach lies in the combination of individual professional competence and interdisciplinary challenges. This combination is particularly beneficial when working with complex topics such as welfare technology, where interactions between technological sciences, design, humanities, health and social sciences throughout interdisciplinary R&D initiatives are vital. From our point of view, EiT didactics facilitate interdisciplinary skills to a higher degree than any other existing curriculum at NTNU.

3.3 Product development and project results

Experience with EiT from earlier years indicates that one should not expect a product development process within the timeframe of EiT. The results are normally an investigation or a study of the problem at hand and a proposal for a solution. Welfare technology is a new topic to most NTNU students and a topic which facilitates new understanding of their own knowledge. Not only as theoretical knowledge but even more important how to put this knowledge into practice. From a teacher's point of view, it has been stated that going from being a theoretical expert to become an open-minded facilitator is a challenge [10]. This is not necessarily the case in a design department, where students and staff are trained to tackle open ended assignments and focus on needs of the user.

4 INTEGRATING WELFARE TECHNOLOGY IN THE IPD MASTER CURRICULUM

The students in our village reported that the course enabled them to communicate their own expertise to other fields, however what was likewise important was that they increased their awareness of how their actions influenced the entire groups' progress or delay. Gained experience in communicating across of disciplines was another important outcome of the village. There are however practical problems related to the accomplishment of the village. The students are mixed together occasional. This means that the different disciplinary skills of the students sometimes do not match the needs that the project issues demand and sometimes the teams as such have not multidisciplinary capacity to solve the problem [11, 12].

Learning from EiT means for the Department of Product Design to seek cooperation with other disciplines and establish study projects involving interdisciplinary teams. The following aspects are key elements from the EiT course that are relevant for the design curriculum in general:

Conceptual and communicative relevance: Seeking how special disciplinary terms can be used to verbalize a common terminology.

Methodological relevance: Analyzing disciplinary methods and tools for certain technologies to match quantitative considerations like technical implementations, economic efficiency, profits and competitiveness with qualitative, ethical and value based considerations.

Normative relevance: Mapping and relating culture and life-styles, values to design solutions.

Operative relevance: Combining design theories with matter-of-fact aspects to create synergies.

Conclusively, design as a driver for product and service innovation in the welfare sector is underestimated. Technology, service development and innovation may gain from having a design perspective. Design contributes significantly with models and methods to innovation processes by involving stakeholders. One aim of this involvement is to analyze and apply actors' interests as premises for product and service solutions. An actor-oriented approach thereby creates a potential for realizing cultural and social values. What is needed, however, is conceptual knowledge, theories and methods to be developed within the interdisciplinary field between design, health sector and welfare research. Disciplines such as ergonomics, sociology, and health- and social care can contribute greatly to fill these gaps and, in turn, learn from design related to different forms of user and actor involvement. For these reasons, a common course for design and health care and welfare technology (e.g. ICT) students can progress cross-disciplinary collaboration instead of serving mere disciplinary interests.

REFERENCES

- [1,3] Sortland, B. *Guide for EiT Students*, Experts in Teamwork 2013, pp.5-6, pp.3, 14
<http://www.ntnu.edu/eit/guide-compendium-lecture>.
- [2] *ibid.* and *EiT Refleksjonsbok*, NTNU 2013, p.3 <http://www.ntnu.no/eit/emnebeskrivelse-vurd.-kriterier-og-retningslinjer>.
- [4] World Population Ageing 1950-2050, Population Division, DESA, United Nations, p.23
<http://www.un.org/esa/population/publications/worldageing19502050/>.
- [5] Næss, S., Moum, T., Eriksen, J. (ed.) *Forskning om det gode liv*. Fagbokforlaget, Oslo, 2011.
- [6] Der unsichtbare Pfleger, *Die Zeit*, 3 January 2013, <http://www.zeit.de/2013/02/Pflege-Technologie-Ambient-Assisted-Living>.
- [7] Health and welfare services in the Trondheim Municipality
<http://www.trondheim.kommune.no/content/1117630749/Health-and-Welfare>.
- [8] Presentation of the EiT-village Development of welfare services and technology.
<https://sites.google.com/site/eit2013velferdstjenester/>.
- [9] <http://www.microsoft.com/en-us/kinectforwindows/>.
- [10] Summary of students' EiT evaluation 2012
<http://www.ntnu.no/documents/306199/15634283-4508-4035-8bce-fc95a1fd2e12>.
- [11] Sjøvold, E., Sortland, B., *Interdisciplinary Team Work. I: Engineering Education and Active Students*. Uppsala, Sverige: Uppsala Universitet 2006 ISBN 9789163183874.
- [12] Jaccheri, L., Sortland, B., *IT and art meet in a multi disciplinary University course*. Association for Teacher Education in Europe (ATEE) 29th Annual Conference; 2004-10-27 - 2004-10-29.