Facilitating Social Creativity through Collaborative Designing

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Abstract. The present study introduces the "Facilitating Social Creativity through Collaborative Designing" project, an undertaking aimed at developing and testing Virtual Design Studios (VDS) in education and professional communities. VDS is a pedagogical approach supported by collaborative technologies, focused on engaging learners in the co-design of various artefacts. The present poster provides a synthesis of results concerning multiple design experiments regarding VDS at the elementary, higher educational and professional levels. The reviewed data generally support the usefulness and benefits of VDS, and indicate the areas where improvements are desirable.

Introduction

Virtual and networked working practices, which allow sharing of expertise and competencies, are becoming more and more common, both in workplaces and in education. The increased need to rely on information networks and virtual design studios (VDS) is likely to radically transform the work of designers and students. '*VDS*' refers to a computer-supported environment or www-based resource that allows communities separated by time and space to work with shared design objects (Maher et al., 2000). The purpose of the project "Facilitating Social Creativity through Collaborative Designing" was to develop pedagogical practices and models that promote collaborative designing in education and in the practices of professional design, and to gather data on their fruitfulness and efficacy, as well as participants' experiences in the design process in this new medium (Lahti et al., 2004). The project examined how social creativity can be integrated by means of probe collaboration models and tools supporting distributed work. More generally, the present investigators developed virtual design studios in education according to the following objectives; 1) to develop and implement authentic and meaningful design contexts in VDS, 2) facilitate creation of shared design ideas in design teams, 3) support participation of end users in VDS, 4) provide expert-support for the virtual design process, 5) create scaffolds for design thinking based on a progressive inquiry model, and 6) carry out empirical case studies at the elementary, higher educational and professional levels, to gather data on the effects and effectiveness of the VDS's and document their process.

Longitudinal studies at the elementary level

The first longitudinal school project at elementary level was organized in close collaboration between the class teacher and the researchers. The aim of the "Artifact project" (Seitamaa-Hakkarainen et al., 2004) was to create a collaborative knowledge-building culture in an elementary education setting and to develop knowledge-building practices by using a progressive-inquiry model. The aim of the second school project, the "Architecture project", was to continue to use the knowledge building practices in students' collaborative design process. In the second project the students participated in architects' professional working practices and engage in solving an authentic and challenging design task. In the school projects, both the material and the conceptual aspects of artifacts were productively involved. The parallel pursuit of these two aspects of artifacts was greatly facilitated by Knowledge Forum (KF), a computer-supported environment that helped to put students' ideas into the center of discussion (Scardamalia, 1999).

Design experiments at higher education

The first VDS experiment in higher education focused on examining how the progressive inquiry model of collaborative designing (see Seitamaa-Hakkarainen et al. 2001) bears fruit in these settings. Collaborative computer use, working to produce shared artefacts, characterizes advancement of designing in VDS (Seitamaa-Hakkarainen et al., in press). In addition, the researchers were interested in how members of design teams develop shared design ideas and organize their collaborative activity within VDS. The second VDS experiment focused on examining the role of participatory design in design education. The researchers looked at what roles users come to have in design process. In the third experiment, researchers looked for means of integrating support of domain experts as a part of

VDS. The aim was to analyze how the virtual design studio supports multi-professional design teams in order to achieve mutual understanding and transform design ideas into desired products.

Professional designing

In professional level collaborative design, we carried out studies through the "Intelligent Clothing Design Project", which was divided into three main phases: design, prototyping and evaluation of the concept. The project provided an opportunity to explore an authentic collaborative design process in which the end-users of the product also participated. In the concept-design phase, the objective was to examine how end-users and experts could participate in the concept-design process in VDS. The researchers were interested in what role the VDS would play in the communication with the design-team members and the kinds of collaborative processes taking place between the team members. Another goal was to use the VDS to experiment with ways of representing the concept so as to get feedback from team members. In the prototyping phase, the study examined how the VDS would facilitate the prototyping process and communication between members of the prototyping team, design team, and project personnel. In the concept evaluation phase, the intent was to inquire how the visual prototype and representation would succeed in taking the evaluation process forward and in how informative the visual prototype was in terms of the concept's functional, expressive and aesthetic properties. In addition, the research studied how usable the actual visual representation was, as seen from the end-users' and the researchers' points of view. We summarize the findings in the next section.

Summary of Results; Conclusions

The students and professionals involved in team-related activities during the processes of design undertake complex multifaceted activities. As design projects become more complex, relationships and roles become more varied. The extent and character of virtual design can be affected a number of variables, including the distance between members, the length of time the virtual team has functioned together, and the experience with technical skills of the team members. The research findings revealed that the mode of collaboration can vary from constant to intermittent collaboration. Further, the results showed that there are various ways to implement user-centered or participatory design in VDS. The design experiments provided evidence that it is important for the design process that students and participants construct a coherent design context and specify design constraints by structuring the process iteratively, together. The collaborative design process is not just designing the products, but also jointly designing the process itself. In all, the findings of the various design experiments provide a clearer understanding of the implications for working collaboratively in the VDS and evidence regarding desired outcomes. The collaborative virtual design process is different from traditional team-work. The differences between traditional team-work and virtual design team are encapsulated in collaboration between participants when creating a new artefact, creating sharable externalizations and organizing the process. Our evidence shows areas where further improvements are desirable. In further studies, we need to analyze participants' situational awareness, styles and strategies in order to improve virtual design. Further, we will need to deepen our understanding of how to motivate the end-users and experts to actively participate in the participatory design processes, and how to get end-users' and other experts' implicit knowledge into an explicit form using the VDS.

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