New Approaches to Media-Supported Project Work at the University Level

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Abstract
We present experiences made with a course in applied computer science which was based on the concept of communities of practice. Within the scope of the course “Entrepreneurship and New Media” we offered a project lab which was accompanied by a set of lectures given by internal and external lecturers. In the project groups, the students worked in close cooperation with start-up companies. The students were connected through a community system to each other and to their supervisors in academia and practice. As the communities of practice emerged we discuss the role they may play in teaching.

1. Introduction

Digital media use in university level teaching is an important research area [4]. The major challenges are to develop adequate technical functionalities to support individual and group learning processes as well as to embed these functionalities in innovative didactical concepts. Recent fallacies, like many endeavours of tele lectures, support our claim that digital media are as useful as their relation to innovative didactical concepts. Another major challenge is the combination of practice oriented education at universities with concepts of lifelong learning.

We want to present the main results of our analysis of an innovative computer-supported course in applied computer science. Traditionally university teaching is based on an “instructionist” understanding of learning. The learner is seen as receptive system, which stores, recalls and transfers knowledge. Recent scientific approaches favour constructionist and socio-cultural concepts of learning. According to Vygotsky [5] learning is seen as an active, constructive and social process. Learning means not just transferring knowledge. Learning is rather the permanent construction of knowledge, based on former experiences [2]. In the following, we will explore the role of socio-cultural theories of learning. They take learning as a collective process linked to specific contexts of action. Knowledge emerges in communities of practice (CoP) [6] by discursive assignment of sense. CoP are characterized by common conventions, language, tool usage, values and standards. The development of a common practice which defines the community integrates the negotiation of meaning among the participating members as well as the mutual engagement in joint enterprises and a shared repertoire of activities, symbols, and artefacts. This community practice is inseparable from issues of identity which is mainly determined by negotiated experience of one's self in terms of participation in a community and the learning process concerning one's membership in a CoP [6, pp. 145]. The approach combines the “two sides of the medal” of community participation: the social practice of the community as a collective phenomenon and the identity of its members as an individual one.

2. Description and Evaluation of the Course

Successful start up of companies acquires a lot of professional, practical and social skills. Thus, entrepreneurship courses typically cover issues such as: economic and legal basic knowledge, mediation of role models through invitation of entrepreneurs, practice oriented teaching, networking between entrepreneurship oriented students and mediation within social networks. An example for a comprehensive approach for entrepreneurship teaching is the curriculum developed by the MIT Entrepreneurship Center, Sloan School of Management [3], which was studied by the authors while staying at the Center in 2001.

At German top technical universities a vivid entrepreneurial scene has emerged, partly based on successful entrepreneurial courses like “team oriented development of marketable computer science products”.

The practical course “Entrepreneurship and new media” which dedicated itself to the use of new media in the context of enterprise establishments was offered in the winter term 2001/2002 at RWTH. We conceptualised the course as shown in figure 1. A major part of learning was supposed to happen by legitimate peripheral participation in the community of practice of the start up companies. Students should acquire practical knowledge while solving complex and authentic tasks. Group oriented learning processes, especially among the student teams...
and between them and their academic advisors, should be facilitated by a community system. Additionally, instructors were available for consultancy and supervision. The weekly lecture series supported the reflective processes of the students. While initiating learning processes among the students, the design supported the knowledge construction in industry, as well. Discussions between students and practitioners were thought to be the starting point of learning processes in practice.

![Figure 1: Design of the digital media supported course “Entrepreneurship and New Media”](image)

The community system “CommSy” is a web-based cooperation platform that provides different working areas in which libraries with literature, black boards for announcements and discussion forums can be used [1].

Partly-structured interviews with five students, one teacher and one supervisor from the Start-Ups have been made after the term. From a result-oriented perspective, the lecture as a whole can be rated as successful. In both of the project groups, technical solutions for the questions posed were developed. In the first project group, an internet page was successfully developed which includes presentation of a research, discussion forums, a small authoring system and graduated access. Lab group 2 realised a functioning prototype of an internet access with a database for antique furniture as the basis which allowed navigation and specialized search for various criteria.

3. Discussion

In the following, we are going to investigate to what extent the establishment of communities of practice and social networks had been successful and which factors had influenced its success or failure, respectively.

- **CoP emerged between students and industry**
  - But: economic stability of start-ups and lacking of computer science competences by the industry partners were true barriers.

- **CoP emerged in both lab groups**

- **Instructors were moderators, not teachers**
  - But: Dichotomous role as reviewer was sometimes not encouraging students to discuss problems openly.

- **Community system supported CoP**
  - But: Group size, rival media, good meeting possibilities, and missing encouragement by moderators caused insufficient system usage.

Socio-cultural learning theories stimulate the design of practical courses in applied computer science. We have discussed a digital media supported lab course accompanied by a lecture series. It is different from classical industrial internships because students are not supported by university teachers in that extent, and it is different from university based group work because student are in contact with company CoP. Both, networking on a technical and on a social level offer new opportunities for university level learning.

The concept discussed was evaluated in the course. Results showed that the learning mechanism of legitimate participation was basically fulfilled. In the core of both groups high intensity learning CoP emerged. Design flaws, cultural as well as professional diversities, and imponderableness of reality limited the success without discrediting the overall approach.

The implementation of such concepts depends deeply on the changing role of university level teachers. They are challenged by the intensity of temporal and emotional engagement as well as by the needed professional qualification. The selection of suitable community systems is crucial for the establishment, maintenance, and development of CoP. These are very new duties and need developed social competencies in fostering trust and team spirit. Further development of university structures is needed, however new potentials for universities are offered by networking with local industry and life long learning activities within continuing education.

4. References


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