

Situated action in a distributed, technology supported community of practice

The realms of computer supported cooperative work (CSCW) and computer supported cooperative learning (CSCL) have specifically tackled the research issues of understanding the nature of interaction and collaboration in order to design work situations and software to support them, and furthermore to investigate how cooperative practices are shaped by technology. These issues are also dealt with in the project described in this paper. In the project, computer mediated interaction will be researched in order to learn more about the possibilities and constraints of technology in relation to distance collaboration. This paper thus presents a research project¹ within the field of technology supported environments for collaboration, aiming at developing a theoretically and empirically founded notion of computer mediated communication and collaboration. The research is focused on the relation between *construction and maintenance of virtual spaces* for collaboration and the *resources for communication* available in a given context (where “context” is comprised by the elements *technology, participants* and *surroundings*).

Understanding interaction in virtual environments

A communication approach is suggested to grasp the nature of technologically mediated interaction as the setting for collaboration in geographically dispersed groups. Through Herbert Clark’s contribution to discourse theory (Clark & Schaefer 1989; Clark 1996) and especially his ideas about *communication as collaboration*, collaboration within a group of researchers is studied. The participants are seen as members of a community of practice (Wenger 1998), and in particular Wenger’s reflections on *modes of belonging* (Wenger 1998: 183ff) to a community of practice serves as inspiration, as does the duality of *participation and reification*. The concept of belonging and the work related to sustaining one’s engagement in a community I find is closely related to the concept of *articulation work* (Schmidt & Bannon 1992; Fjuk & Dirckinck-Holmfeld 1997) and this relation, among other things, will be explored in the theoretical part of the project.

The main components in the theoretical foundation of this project are Etienne Wenger’s theory of learning in communities of practice, and cognitive psychologist Herbert Clark’s theory on language use as a collaborative activity. They are compatible in the sense that they both build on a *social constructivist* understanding of learning and communication. Further more, the two theories are complementary to each other in the levels of analysis they orient themselves towards. Clark focuses on the micro level in analysis, and for that purpose he applies a conversation analytic approach, whereas Wenger’s notion of community of practice as an analytical tool is “a midlevel category” (Wenger 1998: 125).

¹ The project described here is my ongoing Ph.D.-project at *Centre for the Interdisciplinary Study of Learning* and *Department of Communication*, both at Aalborg University, Denmark.

The overall aim of the project is to contribute to critical and reflective use of information and communication technology for support of human interaction. A deeper understanding of the resources for communication in relation to computer mediated interaction is relevant in relation to a number of areas, e.g. educational settings, professional collaboration, and various other forms of networking.

An empirical study of practice in a community

The data for this study was collected in connection with a 3-year research and development project, Multimedia And Network In CoOperative Research And Learning, MANICORAL². The project aimed at designing, testing, implementing and evaluating a computer based collaboration and communication tool within the setting of a network of researchers in geodesy and geophysics. Three groups participated in the project; a *user group* (geophysical researchers in five different European countries), a group of *technology providers* responsible for providing and developing the collaborative tool set, and a *human cognition, collaboration and communication group*, consisting of researchers from the humanities and social sciences. The research focused on communication and collaboration within the user group, and furthermore there was an interest in the long term-effects of the technology on the *knowledge production, learning and organisational culture within the user group*.

A number of technology supported meetings was arranged in the user group, and systematic video observation was carried out at these meetings. The observations were combined with follow up-interviews with participants. Ethnographic field studies, together with collected documents and group interviews, made up base line data. These base line data serve as the background for the interpretation of the detailed video data. The meetings were primarily *presentation meetings*, where members of the scientific community presented research results or issues for discussion in the group.

At the centre of analysis stands the situated actions of the participants; their handling of the task at hand; their use of resources; the participation roles and structures unfolding, etc. Herbert Clark's theory on contribution to discourse is used to describe the individual participant's use of the resources available in the situation. Especially Clark's notion of *grounding* (Clark 1996) plays a central role in the analyses. Clark & Schaefer (1989) defines a grounding criterion as an essential factor in successful collaboration: "*Grounding criterion*: the contributor and the partners mutually believe that the partners have understood what the contributor meant to a criterion sufficient for current purposes" (Clark & Schaefer 1989: 262). A number of grounding techniques are described, and in analyses to come these grounding techniques will be in focus, mainly in order to explore which techniques are used in distributed technology supported settings, and to see if the mediated setting gives rise to new forms of grounding.

² The project was funded by the EU Telematics Programme and researchers and users from six different nations and 11 research institutions took part. The project started in 1995, and ran all through the years 1996 and 1997.

The focus of analysis

As described above, this is a study of *interpersonal communication*. In the study, participants are located at different physical locations. At some sites more than one person is present, meaning that communication needs no mediation by technology³. To enable communication across sites, a computer based desktop video conferencing system has been installed. Both in mediated and non-mediated settings interpersonal communication take place; one important difference being the communicative resources available to the participants. In relation to face-to-face interaction and collaboration, experience shows that participant roles⁴ in computer supported environments by no means are self-evident.

In order to understand how participant roles are constituted in technologically mediated environments, careful empirical analysis must be carried out. The elaborate communicative situation of the case in this project has varying resources for participation and understanding and offers an interesting scenario of interaction. Basic differences between face-to-face and synchronous computer mediated communication are listed e.g. by Clark & Brennan (Clark & Brennan 1991: p.142) and the following distinctions are made:

face-to-face is copresent, visible, audible, cotemporal, simultaneous, sequential

video teleconference has visibility, audibility, cotemporality, simultaneity, sequentiality

Previous work shows that in the ongoing interaction through the multi modal system, not only does the missing copresence shape the talk and other actions; also, the “shared” factors of cotemporality and sequentiality are not unproblematic and not quite similar to those in copresent interaction. The lack of copresence means that e.g. both visibility and audibility are not self-evident, but the status of one being seen and – most importantly – heard becomes something that needs to be communicated about (Georgsen & Raudaskoski in press).

Collaborative actions in virtual environments

In summary, Clark’s theory serves as the point of departure for a discussion of collaboration in virtual spaces, or perhaps more accurately, *communication spaces*. The issue of *collaborative construction of meaning* is at the center of both Clark’s and Wenger’s theories, and detailed analyses of the situated action are expected to provide new insights into the conditions of virtual communities of practice.

In order to explore the nature of virtual communities of practice and more precisely the actions within them, we need to consider both the concepts of *action* and of *virtuality*. I shall do this briefly on the background of Wenger (1998). What makes actions in virtual environments something we need to deal

³ A more accurate way of phrasing this would be “no other mediation than by language itself”. However, in this brief account I will leave out further discussion of the concept of mediation.

⁴ The notion of participation roles is influenced by Goffman’s concept of participation structures (Goffman 1981).

with in greater detail? In my understanding, the pivotal issue is the fact that the very community of practice itself is constituted through the actions of the members, and that the possibilities for members of a community to act and interact with each other are crucial to the potential of the community. Therefore, in order to accomplish successful collaboration in virtual communities we need awareness of the scope of actions in the virtual environment.

Practice is constituted through the process of *negotiation of meaning* a continuous process involving members of the community (Wenger 1998: 52ff). As such, the very foundation of a community is embodied in the actions of the members. Practice must be understood (at least partly) as concrete, embodied actions, taking place on a manifest level. It is crucial that actions are accessible to other members of the community, in order to allow for the continuous negotiation of meaning. Wenger puts it this way: "Practice does not exist in the abstract. It exists because people are engaged in actions whose meanings they negotiate with one another" (Wenger 1998: 73). This means that even if actions do take place at different locations (as in the case of a group of geographically distributed scientists), members need the opportunity of negotiating the meaning of these actions among each other. As with practice, also actions do not exist in the abstract, but must be seen (and perhaps most importantly, also *studied*) at the level of appearance.

Although participants in distributed technologically mediated collaborations have a different and in some senses reduced set of resources available to them, this does not automatically imply that their actions will be more or less *abstract* or *concrete*. However, it does mean that the actions will be of a rather more *symbolic* character. Real-life handling of physical objects by several members of a community naturally becomes an impossibility, when collaboration takes place across time and space. As a consequence of this, actions in technologically mediated settings are generally characterized by the *manipulation of symbols*, most commonly words, figures, visualizations and images. In research to come (Georgsen forthcoming), the modes of participation described in Wenger 1998⁵ serves as inspiration for an analytic tool. This is applied on video observation data in order to explore further the range of actions, and the impact this has on the community.

⁵ In short, Wenger distinguishes between *engagement*, *imagination*, and *alignment* as modes of participation in practice, and argue that one reason for making this distinction is that the different modes "require different conditions and kinds of work" (Wenger 1998: 183).

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