Community-building with Web-Based Systems – Investigating a Hybrid Community of Students*

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Abstract. This paper examines *WiInf-Central*, the 'virtual homeplace' of a student community (on Information Systems) at the University of Hamburg, and focuses on processes of social identity and community-building. Drawing on social-identity theory and communities of practice as our theoretical basis, we illustrate that the processes of identity-building and positive in-group evaluation triggered by *WiInf-Central* serve as a means for students of Information Systems to assert themselves against faculty members and students of other disciplines. While our study reveals strong mechanisms of social exclusion, inclusion mechanisms have to be assessed in a more differentiated way. In particular, our study shows the emergence of several 'subgroups', which appear largely closed to other community members. We ascribe this to both the self-organized and the hybrid – half virtual, half real – nature of the community based on *WiInf-Central.*

Keywords: CommSy, Communities of Practice (COP), E-Community-Building, hybrid and self-organized community of students, qualitative interviews, Social Identity Theory (SIT)

1. Introduction

As people increasingly engage in online-activities and as research focuses on computer-supported cooperative work and learning, questions of virtual identity and community-building need to be addressed (Blanchard and Markus, 2002). On the one hand, the – often web-based – software systems provide a means to increase and enhance interaction in social aggregations and thus can foster processes of community-building. One the other, communication via electronic tools is often viewed as anonymous and impersonal. In virtual settings, personal characteristics such as sex, age, appearance, occupation, etc. – crucial to face-to-face processes of social categorization and community building (Turner et al., 1987) – are often blurred, indiscernible or even deliberately faked (Donath, 1998, 2001; Preece, 2000). This contradiction calls for both theoretical and empirical consideration.

In this paper, we present a case study of a community of students of Information Systems at the University of Hamburg. We investigate the usage of a web-based platform named *WiInf-Central* for self-organizing this community of students: How does *WiInf-Central* contribute to the processes of community-building? And what would the community be like without the use of *WiInf-Central*? In former studies on this community (Pape et al., 2002b) we found evidence for the building of a collective identity and the establishment of a shared practice within the process of self-organization of the community.

Processes of community-building and group identification have been investigated by social psychologists and interpreted in a number of theoretical frameworks. But can those theories also be applied to virtual communities and groups who interact and communicate via electronic media, such as e-mail and the internet? Our study examines whether the classical theory of social identity (Tajfel, 1982) and the newer approach of communities of practice (COP) (Lave and Wenger, 1991; Brown and Duguid, 1991) are useful and sufficient to describe communities based on computer-supported interactions.

Our paper is structured as follows: In section 2, we present the case study of a community of students on a platform named *WiInf-Central*. Two series of semi-structured interviews were conducted with members of the platform and then analyzed with respect to the concepts of social identity theory and communities of practice as our theoretical basis. Our theoretical approaches and research design are described in section 3. In section 4, we present our empirical findings concerning community-building with *WiInf-Central* in detail. Subsequently, we discuss our results and present our conclusions in conjunction with some remarks on the theoretical and practical implications of our findings in sections 5 and 6.

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2. The case study *WiInf-Central*

WiInf-Central is the name of a community system for students of Information Systems at the University of Hamburg. The students use this web-based community platform originally introduced by themselves to serve as a medium of communication and information-sharing. Faculty members are not allowed to use the platform and thus cannot be members of the related community. In section 2.1, we will sketch the characteristics of the course of study of Information Systems, the community of students in this course and the technical platform they use for their communication purposes. In section 2.2 we compare and contrast our findings with the literature on virtual communities and on learning communities. We characterize the *WiInf-Central* community as a hybrid community of students.

2.1 Characteristics of WiInf-Central and its context of use

Information Systems is one of the newest programs at the University of Hamburg. It was established in 1998 and is co-sponsored by the departments of Business Administration and Informatics. The first students who enrolled were confronted with a number of challenges. The formal regulations of the program had not been tested and lacked detailed interpretation. Thus students suffered from a high degree of uncertainty. There was also some struggle among the co-sponsoring faculties for domination of the curriculum, which one of our interviewees articulated as follows:

"I think they do not really understand each other. In the founding process of the course they were fighting one another instead of co-operating smoothly."

And further:

"I think there is not enough official input from the departments to establish this course of study as an intellectual home that students could identify with in a positive way."

The curriculum does not provide separate course selections for students of Information Systems, but schedules them together with students of Business Administration or Informatics. In 1998, approximately 600 first-year students were enrolled in Business Administration and 300 in Informatics, contrasting with only 50 enrollees in Information Systems. Understandably, the latter felt overwhelmed and hampered in organizing their studies.

Therefore in an introductory seminar for first-year students, called 'orientation unit', an extra emphasis was placed on community-building among the first-year students of Information Systems. The students initiated a web-based community system to foster communication. After hosting a 'handmade' website for about one year, the students decided to use an existing groupware system in order to ease active participation in communication processes. The software *CommSy* was chosen because this platform was being developed within the Department of Informatics and some of the students had close contacts with the software development team.

CommSy stands for Community System and is a web-based system to support learning communities and project groups with so-called *project rooms* (Janneck and Bleek, 2002; Pape et al., 2002a, b). The design of CommSy emphasizes collaboration and cooperative work. Each project room provides exclusive access to members of a specific group and can be nicknamed to support a common identity (in this case, the nickname is '*WiInf-Central*'). News and schedules can be announced via the system. Each participant has a small 'homepage' with his or her name, a picture and contact information. Members may also form subgroups to work together on a specific task. Literature and other study material can be interchanged via the system. Discussion forums, which may be structured according to the respective needs, are available for discourse. All users are presented with the same view of a project room. There is no hierarchical structure of users` access rights: Only the creator of an item may modify or delete it. Apart from that rule, only the administrators of a project room may modify other users' entries, but in our experience this is seldom practiced. The primary responsibility of an administrator is to create a project room and provide access to it for group members.

Figure 1 shows the home page of *WiInf-Central* and illustrates the functions of the software system CommSy as described above.

Essentially *WiInf-Central* is organized and maintained by students of Information Systems, plus a few research assistants attending the course of study. In addition to administrating the system they also actively engage in the acquisition and contribution of relevant information for their fellow students over the system.

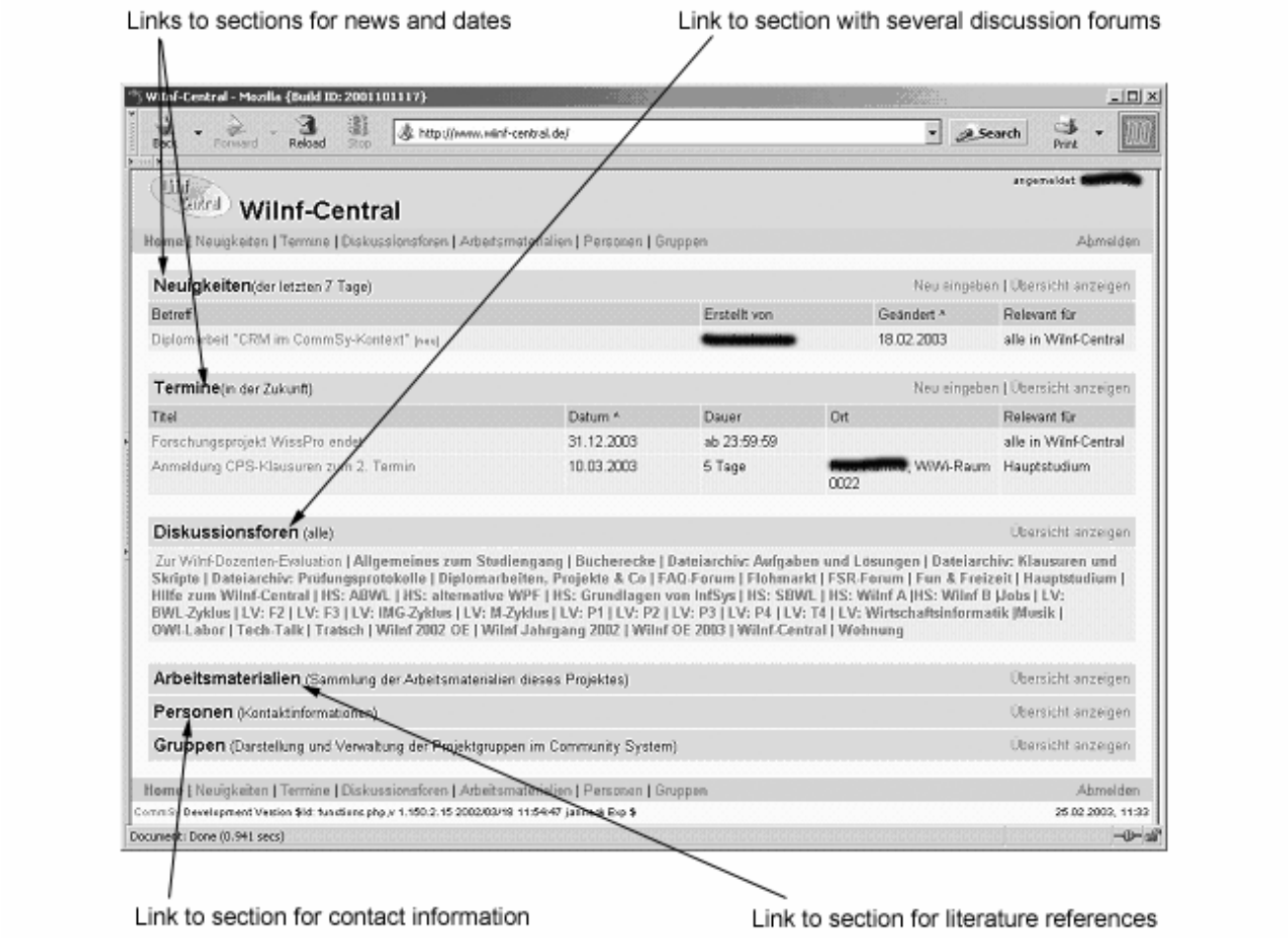

Figure 1: Home page of WiInf-Central

2.2 WiInf-Central – a Basis for a Hybrid Community of Students

We characterize the *WiInf-Central* community as a *hybrid* community because it relies on virtual as well as real-life communication. So far there has been little research on hybrid communities. The main focus in literature is on virtual communities in contrast to social groups. Therefore, existing definitions of virtual communities describe the *WiInf-Central* community insufficiently. For example, Rheingold's classical definition, which characterizes virtual communities as "[…] social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace" (Rheingold 1993, p. 5), does not fit the *WiInf-Central* community since this community did not emerge out of virtual communication. In our case an *existing* social aggregation uses technological support to establish a community.

Studies dealing with the effects of online collaboration on face-to-face interactions in a hybrid setting such as *WiInf-Central* state that virtual communication patterns correspond somewhat to real-life communication (Beard and Harper, 2002; Blanchard & Markus 2002; Blanchard, 2004; Hummel & Lechner 2002; Preece 2000; Quan-Haase and Wellman, 2004; Rohde, 2004; Wellman et al., 2001). In our view, the patterns of face-to-face communication within the course of study are matched in the use of *WiInf-Central*. Students of the emerging study course in Information Systems, which is organized by the two well-established departments of Business Administration and Informatics, initially lacked a sense of affiliation, identity and community. The use of *WiInf-Central* with its exclusive membership offered a source of identity not provided for otherwise. From this viewpoint, the efforts to build stable community limits (by controlling access to *WiInf-Central*) can

be interpreted as a means to counteract the experiences of anonymity and lack of community within the course of study. We therefore hypothesize a strong interdependency between virtual and real-life communication within a hybrid community.

Blanchard and Markus (cf. 2002) investigated the virtual sense of community in the "Multiple Sport Newsgroup" (MSN). As in real-life communities, the following dimensions are important for the virtual sense of community: mutual recognition among its members, informational and socio-emotional support and identification with the community. According to Blanchard and Markus, the main difference between real-life and virtual sense of community can be described as follows: While members of real-life communities regard their community as a whole, in virtual communities the identification and recognition of individual members seems to be more important for establishing a sense of community. Consequently, relationships among members are of high importance because they have to be built and held up actively and explicitly. Related observations in respect to *WiInf-Central* are contradictory: On one hand, communication in *WiInf-Central* seems to be factual rather than emotional. On the other, members of *WiInf-Central* are able to recognize each other without having to make any explicit efforts due to their physical collocation. In our view, this contradiction characterizes the hybrid nature of the *WiInf-Central* community: Relationships and sense of community among members are established on a face-to-face basis and then reproduced in their virtual interactions.

Our study aims at enhancing prior research on processes of community building in online communities both theoretically and empirically. Theoretically, we draw on *social identity theory (SIT)* and the approach of *communities of practice (COP)*. These theoretical approaches deal with the emergence of a collective identity and shared practices within a community. While COP has been getting more popular in the CSCL-/CSCW literature during the last years (cf. Arnold and Smith, 2003; Duguid, 2003; Eales, 2003; Haas et al., 2003; Orlikowski, 2002; Rohde, 2003, 2004), the SIT approach is largely ignored in ICT-related research. Empirically, our study highlights processes of community building in hybrid settings. We focus on the relation of community building in physical and online presence. Furthermore, our study aims at extending the body of research on learning communities.

There are different types of virtual communities in the university context (Harasim, 2003; Koch 2003; Preece; 2000; Pena-Shaff et al. 2001; Shneiderman, 2002; Swan, 2001), i.e. online courses or faculty, student or alumni communities. When comparing student communities, the level of their institutionalization needs to be taken into account. Contrary to other examples in the literature (Beard and Harper, 2002; Churchill et al., 2001; Cobb et al., 2002; Dettling and Schubert, 2002), *WiInf-Central* solely rests on student interests and is completely independent at an institutional level. Furthermore, one has to decide whether the platform is mainly used for teacher-student-communication or for communication between students. The latter is true for *WiInf-Central*. The use of *WiInf-Central* clearly exceeds the notion of self-directed learning and a non-directive role of teachers as emphasized in pedagogical literature (e.g. Rogers and Freiberg 1994): It was initiated by students and is still completely organized and maintained without substantial contributions of teachers. The comparison of the *WiInf-Central* community with (virtual) learning communities somewhat resembles its comparison with social groups and virtual communities: Since *WiInf-Central* was not set up according to didactical principles, participation in the community, the community development and its institutionalization constitute an implicit, yet significant learning process.

Our study differs from most analyses of distributed or virtual learning environments, which are merely focused on online learning and teaching (e.g., Harasim, 2003; Palloff and Pratt, 2001; Swan, 2001; Tu and McIsaac, 2002) or on technical platforms for collaborative learning (e.g., Churchill et al. 2001; Cobb et al., 2002; Daradoumis and Marques, 2002; Klamma et al., 2002; Pena-Shaff et al., 2001). Unlike most of these studies, we investigate a partly physically collocated, partly spatially distributed community of students using a technical platform more for the *coordination* and *organization* of their studies, courses and projects rather than for learning purposes themselves. Indeed, like in most of the mentioned studies on online-communities and virtual classrooms, "distance matters" (Olson and Olson, 2001), but in our case it is a matter only *besides* physical face-to-face interaction. Thus, in our study we have to deal with new forms of coordination and cooperation in online learning communities.

3. Theoretical Approaches and Research Design

In this paper, we represent the second step of interpreting our empirical investigation of the use of *WiInf-Central*. In our earlier work we identified central characteristics of the *WiInf-Central* community as a hybrid community of students, describing the main *purposes* of the community, its *limitations and boundaries* and the *interaction* between the *software design* and *software use* (Pape et al., 2002b). Our findings on the social structures of the community, the community boundaries and their reification in the adoption and use of the software hinted at strong mechanisms of social exclusion which served as a source of collective identity for students, even though the level of actual activity within the community was perceived as low and rated quite ambiguously by its members. This led us to focus more closely on two aspects of

community-building in web-based cooperation systems: the *conceptualization of collective identity* in a group of users and the *common practices* within this group.

Processes of collective or group identity and outgroup discrimination are described by the well-known social psychological approaches of *Social Identity Theory*, SIT (Tajfel, 1978, 1982) and *Social Categorization* (Turner et al., 1987). The establishment of social practices within a group is the main concern of the approach of *Communities of Practice* (Brown and Duguid, 1991; Lave and Wenger, 1991; Wenger, 1998). Drawing on these theoretical concepts, which are described in detail in the next two sections, our research examined whether and how members of the *WiInf-Central* online community developed a collective identity as a pivotal condition for establishing a community of practice. Our research questions and design are described in sections 3.3 and 3.4.

3.1 Social Identity Theory (SIT)

Social identity and *social categorization* are social psychological concepts that locate identities (even collective ones) within the individual rather than within social groups (like sociological approaches are prone to do). Self-categorization theory deals with the individual self as a repertoire of cognitive representations, which is the basis for self-definitions and self-interpretations of a person (Turner et al., 1987). These cognitive representations are considered as self-categorizations of an individual compared to other individuals or groups. Each individual positions him- or herself in social situations and contexts with respect to intra-class similarities and inter-class differences.

According to the social categorization approach, individuals tend to reduce complexity of social reality by categorizing themselves and others as members of social groups, i.e. in terms of in-group members and out-group members. Social identity of a person therefore represents the aspects of an individual self-concept that are derived from membership in social groups (Tajfel, 1978, 1982).

Drawing on Leon Festinger's view on social comparisons (Festinger, 1954, 1957), SIT postulates that individuals tend to evaluate a social group to which they belong – the so-called *in-group* – more positively in comparison to *out-groups*. Henri Tajfel names the development and maintenance of a positive self-esteem as the main motivation of individuals to join social groups (Tajfel, 1978, 1982). Individuals identify with the positive in-group by differentiating themselves from dissimilar (and negative) out-groups. These processes of social categorization and social identifications are needed to position the personal and social self in a highly differentiated social context. In order to build a positive self-esteem it is important that this social identification is always linked to evaluations and emotions concerning in- and out-groups. Social identity is a vehicle to bring individuals to their 'place in the world' (Simon 1999).

Accordingly, social identification and social categorization are not so much processes of social comparisons between individual persons but more between social groups. If comparisons between persons take place, they focus on the individual's membership in in-groups or out-groups (Tajfel 1982). Membership in a social group can include three dimensions: cognition (to know about one's own or others' group membership), evaluation (a positive/negative evaluation of group membership), and emotion (a good/bad feeling resulting from being a group member or being confronted with out-group members).

Experiments by Henri Tajfel, using the 'minimal group paradigm', showed that the random segmentation of test persons in two experimental groups can already initiate processes of social identification and categorization (e.g. Klee and Kandinski fans). He succeeded in eliciting group effects with the described intergroup discrimination (Tajfel, 1982). Besides this empirical evidence for the relevance of social categorization in social contexts, SIT forms the hypothesis that processes of social identification and intergroup discrimination depend on the so-called *salience* of self-categorizations in social situations. The concept of salience deals with the conditions influencing the relevance of in-group/out-group categorizations for self-perception and behavior (Turner et al., 1987; Oakes et al., 1994).

Social identity is not stable over time and independent from the situation. Yet, it is situated in a social context. Social identification is dependent on the cognitive, evaluative, and emotional quality of the fit between personal perception of group membership and situative conditions. Thus, a social category is salient if its relative accessibility is high and if a fit between stimuli (person and situation) and category (social group) is given.

According to this last assumption, the process of social categorization of 'us' as members of an in-group and 'others' as members of an out-group becomes more probable as more stimuli (attributes of persons and situations) lead to this differentiation. To illustrate this concept of salience, we present an example: Usually in everyday situations a person might not be very aware of his/her sex/gender as a social category. But if a heterosexual couple tries to enter a public swimming pool on Tuesday evening and realizes that this is the day for 'women only', the category of sex/gender (the self-categorization of 'being a male/a female') will probably become salient. The male partner is not allowed to enter the pool

while the female is. The next day they might enter a restaurant together and not be allowed to sit in the 'no-smoking' area or to order a specific meal because it is on the children's menu. In this situation, they might forget about their membership in different sex-/gender categories while their common membership in the social categories of 'smokers' and 'adults' will be salient.

SIT and social categorization theory postulate that people tend to categorize themselves as a 'group' if the salience of differences among them is minor relative to the differences that they perceive in respect to other individuals not belonging to that group. Thus, perceived similarities between different persons concerning attitudes, beliefs, norms and values, a common task or a shared history, a shared perception of threats or common enemies etc. are significant conditions for social identification and group cohesion. The salience of a certain self-categorization in situations of social comparisons leads to an accentuation of (perceived) inter-class differences and to a reduction of (perceived) intra-class differences (Turner et al., 1987). Therefore, according to a given social situation, these tendencies of *accentuation* of inter-class differences and *generalization* of intra-class similarities lead to perceived differences in comparison to out-group members and perceived similarities with in-group members if group membership is salient for the individual. The overestimation of inter-group differences and underestimation of intra-group differences is called 'social stereotyping' and often connected with prejudices and devaluation of out-groups (Stallybrass, 1977).

3.2 Communities of Practice (COP)

The theoretical approach of *Communities of Practice* (COP) integrates identity theory, theories of practice and theories of social structure and situated experience (Wenger, 1998). In their research on situated learning in working groups, Jean Lave and Etienne Wenger focus on common daily practice of group members, active membership, and in-group awareness (Lave and Wenger, 1991). The most important inclusion mechanisms concerning these communities are processes of collective learning and the production of shared meaning and collective identity. Many authors found the approach COP helpful for the understanding and support of cooperation, knowledge management and collaborative learning (Allatta, 2003; Brown and Duguid, 1991; Osterlund and Carlile, 2003; Wenger et al., 2002). Several case studies conclude that this is also true for virtual or distributed online-communities (Orlikowski, 2002; Haas et al., 2003; Eales, 2003; Arnold and Smith, 2003, Rohde, 2003).

The authors analyzed processes of learning in organizational units. They developed their approach of COP, which became very influential during the last years, through various field studies in American corporations. Their findings characterize processes of learning as engagement in the social practice of groups and networks. The concept of 'community of practice' does not comprise organizations or enterprises as a whole, but (mostly informal) working and cooperation units: "These practices are thus the property of a kind of community created over time by the sustained pursuit of a shared enterprise" (Wenger, 1998, p. 45). In this approach, the social practice refers to explicit and tacit knowledge and competencies. It integrates language, tools, documents, symbols, and roles as well as conventions, norms, rules, perceptions, and assumptions.

In COP, an individual's learning is inherent in the processes of social participation in a COP. Knowledge and learning in a COP are not abstract models but relations "between a person and the world" (Duguid, 2003, p. 8) or "among people engaged in an activity" (Osterlund and Carlile, 2003, p. 3). Individual learning in a COP is mainly based on *legitimate peripheral participation* (Lave and Wenger, 1991): Individual participation must be perceived as *legitimate* by the community members (e.g. through a common task or shared enterprise). During the participation process, an individual might enter the community as a beginner at the periphery and then gain a more centered position over time by acquisition of *cognitive apprenticeship*. Cognitive apprenticeship has to be acquired through participatory observation of experts in the COP, the processing of simple (and more and more central and sophisticated) tasks and a recessive coaching and feedback by the experts. This acquisition process leads to an intensified inclusion in the social practice of the community. Learning is based on this process of inclusion of outsiders, becoming more and more insiders in the common practice. The communities of practice themselves can be seen as "shared histories of learning" (Wenger, 1998, p. 86).

The development of a common practice defining the community includes the *negotiation of meaning* among the participating members, *mutual engagement* in joint enterprises and a *shared repertoire* of activities, symbols, and artifacts. This community practice is inseparable from issues of (individual and social) 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 (Wenger, 1998, pp. 145ff.). The mechanism of (social) identification of individual persons in the social context of the community plays a key role for the formation of a community of practice. We can see that the COP 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. COP theorists focus both on levels of communality and individuality.

Furthermore, not only collective and individual processes are analyzed but also *productive* and *reproductive* practices (cf. Osterlund and Carlile, 2003). While productive practices of a community are directed towards finding solutions for problems, fulfilling common tasks, and reaching a shared goal, the reproductive practices are directed at constituting and reconstituting the community itself. Processes of learning by legitimate participation and identification can be found on productive as well as on reproductive levels of community practice. This differentiation in productive and reproductive practice is crucial for another theoretical distinction which has been introduced by some recent COP publications: To distinguish between communities that do not only share a common practice, but actually coordinate this practice in a direct and systematic way on the one hand, and groups with looser links and weaker coordination on the other hand, the concept of "network of practice" (NOP) was introduced (Brown and Duguid, 2001; Duguid, 2003). Contrary to COP, NOP can be characterized by fewer coordinative rules and less restricted membership. They are more extensive and can include several COP. "The major distinction between the COP and the NOP turns on the control and coordination of the reproduction of a group and its practice" (Duguid, 2003, p. 12). In comparison with COP, NOP can be looked upon as social aggregations with a higher degree of openness that allow higher dynamics. Furthermore, an advantage of the NOP concept is that it makes sense for larger, more amorphous and looser-tied groups than those that the COP approach would define as a community.

3.3 Research Questions

It should be noted that our study differs from most of the previously mentioned SIT and COP research in one specific aspect: Although all members of *WiInf-Central* are students of Information Systems at the University of Hamburg they might not know each other by interacting or cooperating in a physical environment. Members of this group represent different semester levels. Most of them are likely to know each other only by name, and only through interaction via *WiInf-Central*. Some community members meet face-to-face frequently, others do not. Thus the community is neither purely physical, nor purely virtual. Therefore, in contrast to the research subjects of the presented theories, we are analyzing a 'hybrid community' that exists in the 'real', physical world as well as in a virtual one. The theoretical models described above nevertheless provide some intriguing research questions for our study of the use of *WiInf-Central*.

According to the assumptions and findings of SIT, we expected that the membership of students in the *WiInf-Central* community would generate processes of social identification. Furthermore, the minimal group paradigm suggests that the very perception of membership would provoke processes of intergroup discrimination by the accentuation of inter-class differences and de-emphasis of intra-class differences. Hence, our research focuses on:

- Finding indicators of social identity building within *WiInf-Central*; and
- Identifying situations in which the self-categorization of "*WiInf-Central* membership" is sufficiently salient to generate inter-group discrimination among the members.

The COP approach leads us to focus on more extensive processes of community building. Besides the processes of social identification described above, we are looking for negotiation of meaning, common rules and norms, shared enterprises and learning histories. Therefore, we will determine whether there are

- Common rules, conventions and norms;
- Shared enterprises and goals, mutual engagement;
- A shared repertoire of activities and artifacts within *WiInf-Central;*
- Productive and reproductive practices.

Combining the two theoretical approaches of COP and SIT, we expect to obtain a differentiated view on the group dynamics and enculturation processes within the *WiInf-Central* community. We expect SIT findings to help us gain a better understanding of social identification, which is crucial to the establishment of COP. Furthermore, unlike the main studies of COP theorists which merely focus on quite homogeneous communities and stress the positive and productive aspects of community-building (cf. Brown and Duguid, 2001; Lave and Wenger, 1991; Wenger, 1998; Wenger et al., 2002), we expect to find evidence on more heterogeneous phenomena like differences within the community, 'subcultures', or 'micro-communities'. Furthermore, we assume that processes of community-building and social identification always go along with processes of demarcation: Identification (and therefore creation of similarities) always means accentuation (the perception of differences), social inclusion always implies exclusion at the same time (cf. Oakes et al., 1994; Tajfel, 1978, 1982; Turner et al., 1987; Stallybrass, 1977). In cases of intended introduction and managerial support of COP, these processes of demarcation, accentuation, and exclusion might have unintended consequences or even negative or destructive side effects.

We understand this potential 'dark side' of social identification as an indicator for ambivalence in community-building processes that is often underestimated.

We therefore combine the two approaches of COP and SIT in order to understand whether and how processes of community building might imply heterogeneous and ambivalent side-effects, namely risks of intra-group subcultures and demarcation/devaluation of out-groups. When interpreting our findings, we will bear in mind the distinct hybrid character of our *WiInf-Central* community and reflect on it in the discussion.

Most of the characteristics of virtual communities fit the criteria of social groups or categories identified by SIT, as well as those of the COP approach, i.e. informal (no fixed organizational and hierarchical) structures. Other characteristics such as personnel fluidity and temporal instability over time do not contradict the theoretical assumptions. Nevertheless, the spatial distribution, the non-simultaneity and especially the use of software support might represent some unique characteristics in our study, distinguishing them from the research subjects of SIT and most COP studies. Both theoretical approaches have not been applied very systematically to this special phenomenon of hybrid or virtual communities.

3.4 Research Design

In our research design we aimed at adopting the view of the community members since their commitment is essential for establishing, promoting and maintaining *WiInf-Central*. We therefore chose *semi-structured interviews* as an appropriate method to grasp the subjective views of the interviewees. Notwithstanding, this approach allows for addressing specific topics and comparability between interviews (Kvale, 1996). Interview guide and conduct were designed following the criteria proposed by Merton and Kendall (1946): Non-directivity (no manipulation of the interviewee), elaboration of the interviewee's perspectives and emotions in respect to the interview topics, and grasping of a wide range of facets concerning the interview topics.

Data was derived from two interview series. In a first interview series we interrogated four randomly selected members about their use of *WiInf-Central*. The interviews focused on the influence of the system's design and contents on its usage, information management, the communicative customs among students and the role of community (Raudzus, 2001). According to the concept of theoretical sampling (Glaser and Strauss, 1967) we subsequently conducted a second interview series interrogating four members of *WiInf-Central* who use the system extensively and are seen as particularly active by other participants. We hypothesized that these active members perceive the usage of the system differently and might influence it in a decisive way. In addition to the questions guiding our first interview series, interviewees were asked to describe the history of *WiInf-Central* from their viewpoint, the development of CommSy as technical platform, and technology-use mediation.

Although the number of interviews was relatively small we were nevertheless provided with a profound and detailed data basis. All interviews were very lively and rich in detail. Within each of the interview series, the interviewees reported very similar views and observations. Combining the experiences of 'normal' *WiInf-Central* members on the one hand and especially active members on the other, we were able to gain comprehensive insights into the structures of *WiInf-Central*. Applying the concept of *theoretical saturation* (Glaser and Strauss, 1967), we consequently decided that no more interviews were necessary. Each of the eight interviews took more than 60 minutes and was audio-taped with the interviewee`s permission. All interviews were subsequently transcribed verbatim, resulting in over 130 pages of interview-transcripts.

For an earlier paper on the use of *WiInf-Central* (Pape et al., 2002b), data evaluation was conducted according to the Grounded Theory method (Glaser and Strauss, 1967) which aims at developing hypotheses and theoretical structures from within the raw data: the data material was grouped according to similarity of content (*concepts*) and summarized to generic terms in a second step (*categories*). Finally, relations (*propositions*) between categories were developed and grouped hierarchically (Pandit 1996).

Since our original analysis strongly indicated that the process of community-building mutually interacted with the use of *WiInf-Central*, we reinterpreted our original data in the context of the concepts of SIT and COP as theoretical basis, thus adopting a top-down approach in data analysis contrary to the bottom-up Grounded Theory approach in our earlier work. Three independent raters analyzed and categorized our raw data based on the research questions and hypotheses outlined in section 3.3, explicitly looking for evidence of social identity building and common practices within the *WiInf-Central* community. Only concurrent ratings were included in the final interpretation. We present our findings in section 4.

4. Empirical Implications

In the following sections we will describe our findings concerning the community-platform *WiInf-Central* in terms of SIT and in terms of the COP approach.

4.1 Social Identity in WiInf-Central

Our data revealed several phenomena that relate to social identity theory. First of all we identified salient situations for identification with the community and its members:

Obviously members of *WiInf-Central* gain their membership by their status as students of Information Systems. Thus, encounters with students from other departments constitute a salient situation in which members of the community differentiate themselves from the out-group members. The students of Information Systems are very well aware of the fact that not all departments have community platforms like *WiInf-Central*.

"*Other students envy our opportunity to easily exchange information and our archive of older material"* (interview statement).

The exclusiveness of the system appears to be a very important factor for identification with community membership. Correspondingly our interviewees expressed their satisfaction that *WiInf-Central* is a restricted community platform, which grants access only to students of Information Systems. One interviewee remarked that

"*the WiInf community is defined outwardly by delimitation from other student groups. (This delimitation) increases the group cohesion.*"

An example of intergroup discrimination is given by one interviewee who states that

"*it is very good that access to the system is limited and restricted by a password. Thus, not every 'madcap' can enter the community.*"

To ensure that the system is only accessible to students of Information Systems, several practices have been developed to control access. In the early days of the community, novices were presented with catch questions that only students of Information Systems could answer before they were allowed to participate.

On the other hand, some members reflected critically on these mechanisms for the exclusion of 'outsiders':

"*The system increases the delimitation between different disciplines. This is elitist and foolish*", one of the interviewees stated.

Today older students try to introduce first-year students to the system at the beginning of every term. During the so-called 'orientation unit', a special introductory seminar, an account is set up for every student. Thus, access to the system is passed from one generation of students to the next, ensuring that all students gain access and that the whole community of students is represented on the platform.

Another means to protect the community from unwanted intrusion is the exclusion of faculty members. The fact that only a small minority of our interviewees could imagine opening the community to students from other departments or teachers shows how important the exclusiveness of their community is for its members. Some of the interviewees state very openly:

"*It is good for the identity within the system that it is a 'closed space' where no professor is allowed to enter.*"

In addition to group identification based on the differentiation from out-group members, there are also sources for identification within the group. Most importantly all members of *WiInf-Central* are in a similar situation. As students of Information Systems they are all trying to graduate successfully. Thus they share the same problems and questions concerning the curriculum and university life in general. This common interest shared by all members is an important factor of identification. In this respect, the platform *WiInf-Central* serves as a highly supportive media for asking questions, getting answers and offering information to other students.

Furthermore, identification with the *WiInf-Central* community seems to be supported by the unique situation of the study program in Information Systems at the University of Hamburg, which was not founded until 1998. Therefore, the number of students studying Information Systems is quite small and the program participants share a process of self-assertion, which is aided by a community system like *WiInf-Central*.

"*There is a rather strong cohesion because we are simply a relatively small group of students compared to the 600 students of Economics or the 300 students of Informatics*", one of our interviewees reflected.

After taking a look at how identity is built through salient situations for group membership, we will focus on how students perceive their membership in the community.

Although the degree of identification with the community differs greatly among its members and they hold a variety of views concerning the function *WiInf-Central* fulfills, all of our interviewees valued the mere existence of *WiInf-Central* very highly. It has become an important part of student life which no one would want to miss.

"*WiInf-Central has been present since the very beginning of my student life.*" (interview statement)

The majority of our interviewees regard the exchange of information as the specific purpose of the platform. Thus, the character of the community is perceived by most of its members as factual rather than emotional.

"*For me, the main motivation to visit WiInf-Central is to stay informed about formal study concerns.*" (interview statement)

Accordingly, most members do not see *WiInf-Central* as a substitute for real life communication, but rather as a very convenient source of information and a way to reach a great number of fellow students at the same time. Intimate communication rarely takes place in *WiInf-Central* because all postings are visible to all members of the community. Nevertheless, gossip from the department is occasionally spread, which indicates that the *WiInf-Central* community is more than a mere partnership of convenience.

Finally, lots of members complained about the anonymity of the platform because of the large number of members. In fact, the technical platform of *WiInf-Central* was originally designed for groups of up to 30 or 40 people. With its over 300 members, *WiInf-Central* presents a real challenge to the capacity of the system, because the functions to display and organize data are geared to a smaller number of users. In addition, many members feel that too little personal interaction takes place within the community and that the personal homepage of every member presented on the platform is necessary but not sufficient for personal contacts.

Nevertheless, most people agree that the system represents a big advantage for the community of students. One of the students concluded:

"*WiInf-Central had a positive influence on the community of students of Information Systems. We have become a stronger community than we were before.*"

And another one adds:

"*A positive group cohesion is valuable, because it helps you find an intellectual and academic home.*"

Taking this as a final comment, we will now focus on the Communities of Practice approach to investigate the shared practice and collective learning of *WiInf-Central* users.

4.2 WiInf-Central as COP

In this section, we interpret our empirical findings in relation to concepts of COP and point out indicators for a shared enterprise, shared artifacts, shared activities, mutual engagement, and common norms and rules among the members of *WiInf-Central*.

While references to the *WiInf-Central* community as a partnership of convenience and its use for information retrieval (section 4.1) are clear signs of the productive practice within the community, we also identified efforts and activities directed towards reproductive practice.

On the one hand, our interviewees doubted that a program of study can be seen as a shared enterprise because of the large number of people with different interests involved: The only common goal among students is the successful completion of their studies. On the other, our interviewees expressed that in order to achieve their academic goals they rely on mutual help within the community of students. This assistance relates to factual issues as well as organizational questions concerning the course of study. As a consequence, the students want to prevent their community from declining, as one of our interviewees describes it:

"*We must see to it that our community does not dwindle. There are not as many of us as at the beginning of the year.*"

In summary, students of Information Systems seem to pursue their course of study as a shared enterprise, even if they do so on a limited basis. The community system *WiInf-Central* serves this shared enterprise as an easy-to-access source of information concerning topical and organizational aspects of their course of study. This argument is emphasized by the use of *WiInf-Central* as a shared artifact and the shared practices of system usage.

Interviewees assessed the design of *WiInf-Central* somewhat ambiguously. Most of them describe it as easy to use and providing the functionality necessary for a community system. Nevertheless, the design of the user interface is described as outdated and even somewhat confusing. The users feel that the structure of the system also guides its usage – or partly even forces certain ways of usage on them – while still offering enough freedom for different use purposes. In addition, our interviewees agreed that some problems in *WiInf-Central* exist because of the huge number of users that the technical platform was originally not designed for.

Despite this ambiguous assessment of the design of *WiInf-Central* platform, its members established a common understanding of purposes and types of usage, which we consider to be of great importance for successful computer-mediated communication and the emergence of a sense of community. In the following paragraphs, we describe shared practices of *WiInf-Central* use that also address common rules and norms and the level of mutual engagement in *WiInf-Central*. These practices are the choice of *WiInf-Central* as a means of communication, the frequency and kind of regular use, usage regulations, and the emergence of subgroups.

All interviewees view *WiInf-Central* as an additional means of communication, along with phone, E-mail, or personal contact, rather than a substitute. The choice of medium depends on the extent to which contents are open to the public or subject to competition and rivalry. *WiInf-Central* is seen as 'pull-media' – in contrast to 'push media' such as mailing lists – which prevents data overflow in a large group. Individuals are not flooded with information but have to make an active choice of information retrieval from the system. Still the possibility of reaching a large number of people without much expenditure is commonly viewed as an advantage.

Although the intensity of communication within the system is generally considered low and all interviewees wished for a more active and intense use, there seems to be a shared understanding of how to use the platform. One of our interviewees describes this understanding as follows:

"*I use the system in a rather passive way, just like most of the others do. I log on from time to time and look what's new. [...] If I have interesting input, I post it. But I think not all users do that. It happens more often that they post questions over the system.*"

The users post specific topical or organizational questions to receive relevant answers. Their questions are often answered by more experienced students or by one of the few research assistants who are allowed on the platform. While mutual engagement for raising questions and giving answers takes place on a regular basis, there is no exchange of working papers or answers to practice tasks. The latter is inhibited by the members' perception that there is an imbalance between giving and receiving help.

Our interviewees report similar ways of scrolling through the system during a use session. One of our interview partners describes this common usage as follows:

"*When I enter the system, I first scan the homepage for interesting news and dates. [...] Then I scroll down and look up relevant forums.*"

Aside from this regular scan through the system our interviewees pointed out that they search the sections containing contact information and literature references on a sporadic basis.

One shared understanding of the community members is that the system content should primarily consist of topical and organizational issues concerning the course of study in Information Systems. Private affairs and gossip should be marginal. None of our interviewees reported any instances of quarrels, flaming or of severe political incorrectness occurring within the platform. They expected that such cases would be reported to the system administrators who would delete the respective contents and exclude the misbehaving persons. Up to now, however, the administrators never had to intervene in such a way.

As indicated above, the regular practices within *WiInf-Central* are associated with the emergence of several subgroups within the community of students. A group of experienced students helps new students regularly. The administrators control access to the system and give hints where to post certain information. For this purpose they not only offer support via e-mail, but also have posted information on how to use the different forums. They also maintain a forum for questions concerning the use and design of *WiInf-Central*. Finally, the administrators keep in touch with the CommSy software development team in order to stay informed about latest software updates. Another relevant subgroup is the team of volunteer students who organize the 'orientation unit' each year and thus introduce new students to the *WiInf-Central* community.

The emergence of subgroups within the community illustrates the process of legitimate peripheral participation in *WiInf-Central*. New students are not familiar with the system. When it is introduced to them and they get access to the platform, they begin to identify with the community. The process of learning by integration into the community can be illustrated by participation in the system: Most first-year students use the system passively, looking for relevant information without posting their own contributions. The more experienced users get, the more they take on an active role, e.g. answering questions and posting information. Moreover, these active members create subgroups within the system. Processes of individual learning in this COP can be analyzed by observing the integration of new (and only peripherally participating) members into such subgroups and the process of taking over a more active role in the center of the community. To illustrate these processes, we draw on the experiences of *WiInf-Central* members who show an extraordinarily high degree of activity

and form a subgroup of 'super-users'. However, a longitudinal study investigating users as newcomers to the system and later as more and more experienced users would be needed to describe these processes in further detail.

Members of the subgroup of expert users as well as common users assume that members who show higher activity tend to identify more with the community than others. Active members are aware of their exposed position within the community. They criticize that many other members only use the system for their own benefits without participating productively, which violates the rules of reciprocity. They also reflect on how to foster participation.

"*I wish there was more participation. But I am not sure how to foster it.*" (member of the subgroup)

On the other hand, some of these expert users see a risk in the emergence of subgroups. The subgroup members are worried that other community members might feel intimidated by their high level of activity, which keeps them from developing and shaping their own activities.

"*I guess many [new users] may get the impression that this platform belongs to some few people. And that the others – themselves – have nothing to say. Maybe they just don't dare to contribute anything on their own.*"

Another interviewee observes that the subgroup of 'super users'

"*might seem pretty much as 'closed shop' to outsiders. Others may feel discouraged to get involved, even if this involvement is desired [by the subgroup].*"

Nevertheless, regular users view their more experienced and active fellows as somewhat building the 'core' of a community that they can benefit from:

"*Very significant: the oldest [users] create the most discussion forums, [and you always see] their names at the questions and answers.*"

And:

"*[They] stand out in terms of the level of help they provide for others and because they are the oldest members and hold the most comprehensive knowledge.*"

To sum up our findings, we characterize the *WiInf-Central* community rather as *NOP* than as *COP*, because we found some evidence for a common understanding of the system's usage, but only limited evidence for a shared enterprise. Regarding the participation in *WiInf-Central*, we found evidence for individual learning processes as new members are progressively integrated into the community. At the same time, there is also evidence for processes of intragroup differentiation in several subgroups.

5. Discussion

Since September 2000, approximately 300 students of Information Systems at the University of Hamburg have been using the community system *WiInf-Central.* Within the system, the students discuss discipline-related and organizational topics. Our empirical analysis of this community of students was based on semi-structured interviews and showed evidence for processes of community-building, identification, and the establishment of a shared practice among the users. Therefore, the social psychological theories of social identity and social categorization (SIT) and the approach of communities of practice (COP) were consulted for a better understanding of the processes observed.

Although neither SIT nor COP deal with virtual, distributed, and technically supported groups, we found empirical evidence of processes within the community that support central assumptions of the presented theories.

Consistent with SIT findings users of *WiInf-Central* pointed out that membership in the community system implies affiliation to a social group which differs from other groups of non-members (professors/teachers and students of other disciplines). This group membership leads to processes of

- Identification with the group of users;
- Delineation from other groups with accentuation of differences; and
- Devaluation of 'outsiders' (at least in some cases).

Beyond that, access to the community system (and therefore the group membership) is evaluated very positively, especially in comparison to the situation of other students of Informatics or Business Administration who do not have access. Despite their ambiguous assessment of several details of *WiInf-Central* all of our interviewees expressed the view that they would not want to do without the system. The existence of *WiInf-Central* has become seemingly natural and is taken for granted as one

characteristic feature of the course of study in Information Systems. In this way, *WiInf-Central* increases the social identity of the community of students that would otherwise be related only to symbols like common meeting points etc.

In contrast, mechanisms of exclusion of outsiders are criticized as "elitist and foolish" by one interviewee, and some members wish for more intimate and private communication on the platform. These statements indicate that the students do not relate their social identity only to *WiInf-Central*, but also – or even primarily – to social one-on-one encounters. Nevertheless, it is obvious that the pure existence of *WiInf-Central* causes students to explicitly reflect their social identity.

In terms of SIT, the restricted access to the platform creates a salient situation for group membership and thus group identity and community-building: Students become aware of their membership and start developing pride in the system which is exclusively theirs. Typical situations in which *WiInf-Central* membership becomes salient are the application of a system account, logging on to the platform, encounters with students from other departments who do not have access to the system, or confrontations with teachers who are suspicious of the platform. On the other hand, the absence of outgroup members *within* the platform leads to processes of intra-group differentiation and frictions between especially active and less active users or lurkers (Nonnecke and Preece, 2000): The display of activities on the part of the expert users creates a salient situation for intra-group differentiation.

Concerning the presumptions of the COP approach, our interviews showed that:

- There is a shared enterprise of *WiInf-Central* users regarding their common goal of a successful graduation in the study of Information Systems. The usage of the community system serves as an easy-to-access source of information for this enterprise;
- A common practice of system usage has been established within the community with consensus on norms for adequate behavior and mechanisms of regulation;
- Mutual help and engagement is one of the central aspects of the *WiInf-Central* community;
- Peripheral participation is shown by new users in the system, while more experienced users and older students take over the role of experts.

Beyond that, users complained

- About a very low rate of activities among most users in general; and
- About the establishment of 'subgroups', which appear rather closed to other community members.

Especially these last findings lead to some further questions and hypotheses. With respect to the process of community-building by social practice, we have to ask why several different subgroups or sub-communities seem to be emerging within the *WiInf-Central* community. This might be due to the large number of system users or to a lack of shared everyday practice, especially if we take the low rate of interaction into consideration. This may be the case because the COP concept is limited to smaller groups with a higher amount of cooperation and collaborative activities.

Another reason for this limited evidence of community-building effects could be the partly virtual character of our *WiInf-Central* community. Lave and Wenger deal with working groups and departments of companies that are characterized by well-defined common tasks and daily calls for cooperation. The students of Information Systems have pointed out that they share a common goal (to achieve a successful graduation) but beyond that they have no clearly defined common tasks and everyday practice. As users of *WiInf-Central* they interact in a virtual cooperation environment and communicate sporadically, often without face-to-face contacts for long periods of time. We ascribe this to the self-organized character of the community. Nevertheless, we were able to show that the usage of *WiInf-Central* mutually interacts with community-building effects. Due to the hybrid – half virtual, half real – nature of the community, *WiInf-Central* seems to intensify trends that arise in direct encounters in the physical world. Active members of the student community become even more active or explicitly active within the community system *WiInf-Central*, and rather passive members stay passive in regard to the system.

According to the concept of Brown and Duguid (2001) and Duguid (2003), the *WiInf-Central* community can rather be characterized as Network of Practice (NOP) with looser ties and weaker mechanisms of coordination even though access to the community is closely controlled and restricted, as we pointed out above. Concerning productive and reproductive practices within the community, we observed an interesting contradiction: While members explicitly point to the productive functions of *WiInf-Central* such as information retrieval as the main purpose of the community, the reproductive practices are expressed rather implicitly by most of our interviewees, for example when showing concern about the low participation and a possible decline in numbers. However, as students view *WiInf-Central* as a vital part of their studies and as a virtual home not provided for otherwise, engaging in reproductive practices to sustain the community is a crucial task.

6. Conclusion

Our investigation of the hybrid student community *WiInf-Central* shows that theories of social identity and social categorization may also be applied to the new phenomenon of virtual communities. Furthermore, there is evidence that – in analogy to the 'minimal group paradigm' (Tajfel, 1982) – the mere existence of an electronic platform with restricted access may also elicit positive in-group and negative out-group evaluations, even if the actual activities within the platform are rated ambiguously. Research concerning virtual communities and especially learning communities have to take this into account, for example when evaluating students' satisfaction with cooperative e-learning platforms.

In contrast to the studies on online communities and learning communities described in section 2.2, our case study does not investigate genuine learning processes but processes of self-organization and community building in a hybrid – half physical, half virtual – environment. Furthermore we do not focus on the evaluation of the technical platform *WiInf-Central* but on social mechanisms, which might support or hinder community building. We found evidence that the use of a technical platform (e.g., a community system) can affect and maybe reinforce these social mechanisms.

Our data on *WiInf-Central* supports the assumption that the processes of identity-building and positive in-group evaluation triggered by the system serve as a means for students of Information Systems to assert themselves against the more powerful departments for Business Administration and Informatics. *WiInf-Central* serves as a symbolic 'home' for the course of study that lacks its own infrastructure, and social identity-building seems to play a major role in this respect. These findings are especially relevant for software-supported learning or study groups in general and might also be of interest to special interest groups or volunteer organizations that also increasingly need to cooperate worldwide and require a common identity as a basis for their work (cf. Rohde, 2003, 2004).

Our study revealed strong mechanisms of social exclusion, but inclusion mechanisms and processes of community-building as described by the COP approach have to be assessed in a more differentiated way. There is the suggestion that in virtual communities – where members rarely meet in person – common goals, tasks and enterprises need to be negotiated carefully by all members of the community. Otherwise subgroups of individuals, sharing similar interests and activities or simply formed by coincidence, tend to emerge and threaten to afffect the participation of other community members, as can be observed in *WiInf-Central*. This is especially important since in the case of *WiInf-Central* subgroups are made up of especially active and expert users who – according to the COP approach – should take the role of coaching novices to achieving cognitive apprenticeship. Possibly in a virtual community experts are in danger of intimidating rather than encouraging novice members when displaying their 'normal' rate of activity. That would imply the need for special training of moderators in a virtual environment.

Analyzing productive and reproductive practices within the community, we conclude that productive practices are much easier to define and establish for its members than reproductive practices, especially in self-organized communities with weaker ties and ambiguous structures. Since reproductive practices are crucial for sustaining the community, support measures for virtual communities should take this into account. Analyzing communities that are successful in terms of reproductive practice could yield further insights here.

Nevertheless *WiInf-Central* is a distinctive feature of the course of study that the students of Information Systems established and maintain without official and organizational support. Our impression is that without this platform the course of study would lack an important means of communication. Also, we suspect that in *WiInf-Central* there is a higher rate of activity and communication than can be observed in most other university departments.

Promising prospects for further research are the processes of intragroup differentiation we observed in *WiInf-Central*. We showed that by rigidly controlling access to the in-group, community members create a salient situation leading to positive in-group evaluation. At the same time, exclusive access to *WiInf-Central* and the absence of relevant out-group members seem to induce a non-salient situation in which processes of social categorization and comparison with out-groups do not take place. Instead of social comparisons with out-group members, salient conditions for categorizations within the community can be found, which encourage processes of subgroup building and tendencies of devaluation of other community members belonging to these subgroups. Investigating these processes should lead to interesting theoretical and practical insights into community-building in virtual groups.

Contrary to studies on purely virtual or online communities, the presented case study shows that interaction in the physical world and the organizational context have an impact on the use of a technical system. Social processes of identification and establishing a common practice are underlying activities in cooperation platforms. A next logical step in the research of hybrid communities such as *WiInf-Central* could be the systematical comparison of face-to-face and computer-mediated activities of the community-members.

As our study is based only on qualitative data, the empirical bases of our findings will have to be strengthened with future work. While our case study is solely based on qualitative data, further research should be supported by quantitative data such as log-file analyses and questionnaires.

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