

## **Networked eLearning and Collaborative Knowledge Building: Design and Facilitation**

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### **Abstract**

This paper addresses the core goals for educators to stimulate participation across diversity (including life trajectories and culture) and motivate learners to engage in negotiation of meaning and knowledge building dialogue in the processes of networked learning. The paper reports on a Danish masters online course on networked learning for educators that attempted to realize these goals. The participating teacher learned important methods, including moderation, through experience, guided by a teacher educator whose instructional design was based on communities of practice for participants with different backgrounds, cultures, age, and prerequisites in a shared learning endeavor on the Web. The experience supports a twofold foundation for instructional design: the learning theoretical concept of Etienne Wenger (1998) and an orientation toward participant cultures in terms of experiences and competencies, in order to facilitate collaborative knowledge building online.

Design of distributed collaborative learning processes online seems a complex challenge (Bates, 1999; Collis, 1997; Harasim, 1999). Designing collaborative processes that truly integrate and draw upon individual cultures, competencies, and interests of adult learners appears an even more challenging activity (Sorensen, 2000), which calls for alternative pedagogical thinking in the education of teachers, producing new and pedagogically innovative instructional designs. For years, in particular within the area of continuing education, it has been part of the underlying set of pedagogical intentions to design online courses utilizing the individual student perspectives and knowledge and engaging students in interactive collaboration and shared knowledge building. This ambition has not been realized.

The reason for this lack of realization is ambiguous. On the one hand, it may be rooted in a lack of awareness of the specific asynchronous virtual conditions for the unfolding of human interaction (Sorensen, 1997a). On the other hand, the lack of encouraging results is related to a weak foundation in learning theoretical frameworks. While the problem of designing for quality in networked knowledge building dialogues is of a general nature, the need for stimulating motivation, engagement, and interactive processes seems especially outspoken in the context of continuing education (Sorensen, 2000). In this context, there is a need for pedagogical designs that in innovative ways attempt to match the communicative virtues of the online environment with alternative, theoretically based, pedagogical implementations incorporating and stretching across learner experiences and cultures. In this context, the concept of “culture” should be understood as a system of meaning of which language is primary.

Among the motivating factors pertinent for improving intercultural communication, Brown and Davis (2004) emphasized the personal motivation that “comes with our inquisitive and explorative nature as human beings developing self-awareness” (p. 235). In other words, there is a strong need for such to become operationalized in instructional designs. Thus, it becomes essential, from a design perspective of collaborative learning, to incorporate this criterion in the interactions among learners with different backgrounds in the virtual environment in such ways that they inspire and stimulate mutual learning through collaborative knowledge building (CKB) processes in what has been called “online communities of practice” (Wenger, 1998). This paper addresses such challenge of instructional design as part of an innovative teacher education curriculum.

### **Distributed Collaborative Knowledge Building Online: The Problem**

Any pedagogical design, including designs of networked distributed collaborative learning, implies a latent – and sometimes unconscious – theoretical perspective on what learning is and what it ought to be. Such perspectives always form the context for the choice of pedagogical elements characterizing the learning process (Fjuk & Sorensen, 1997; Sorensen, 1997b). Therefore, it seems essential not only to become conscious of these underlying perspectives, but also to base designs on clear and conscious theoretical understandings, in order to be able to choose corresponding pedagogical-didactic features that are likely to promote the learning perspective and goals in question. This is an important realization for teachers and teacher educators.

One of the most prevailing problems encountered in networked distributed collaborative learning concerns the widespread lack of clarity of pedagogical design and practice in terms of stimulating a qualified interaction and CKB dialogue. This situation includes the familiar experience of virtual learning spaces marked by silence and lack of “social presence,” and it includes the lack of motivation and commitment between learners to collaborate. In particular, the problems of identification and distribution of teacher-learner roles in virtual learning processes seem to form the key factors in this complex set of problems.

Quite a few learning designs of networked distributed collaborative learning mirror a rationalistic and authoritarian perception of learning as something “delivered from above” by experts down to the “empty” students. In such cases it is not surprising that CKB processes are absent. More thought provoking, however, seems the fact that in many cases where CKB has actually been a main part of the design perspective, it often does not materialize (Sorensen, 2000; Stahl, 1999, 2000). A clear understanding of why student collaboration is often absent remains to be identified. Unfortunately, the technology used often gets the blame for this lack of student collaboration, and this blame may be misleading (Sorensen, 2000).

The experiences gained with implementation of distributed networked processes evidently has had mixed success. From a perspective on learning as a collaborative phenomenon, the significant problem of establishing an effective collaborative learning dialogue working for knowledge building seems to be the most complex challenge and is a serious problem to address and resolve.

### **Collaborative Learning Through Online Communities of Practice**

The problem of establishing a motivated, qualified interaction working for CKB in a continuing educational context may be addressed through the theoretical framework presented by Wenger (1998). The two aspects of interaction and motivation are among the central concepts treated in his learning theory, in which learning is viewed as processes taking place in what he calls “communities of practice.”

### **Participation and Mutual Engagement in Negotiation of Meaning**

To establish a CKB dialogue (to ensure a knowledge building process online) corresponds to Wenger’s notion of creating “participation” in a community of practice. To ensure student initiative to participate in a CKB dialogue points to Wenger’s notion of creating “mutual engagement.”

The theory emphasizes the role of experiences and practices of the individual students as means to support the development of group identity. About this complexity in relation to the learning process, Wenger stated,

Learning takes place through our engagement in actions and interactions, but it embeds this engagement in culture and history. Through these local actions and interactions, learning reproduces and transforms the social structure in which it takes place. Learning is the vehicle for the evolution of practices and the inclusion of newcomers while also (and through the same process) the vehicle for the development and transformation of identities. (p. 13)

Wenger’s theory incorporates “participation” and “mutual engagement” as central concepts in the learning process. About the concept, “participation,” Wenger stated,

Participation refers to a process of taking part and also to the relations with others that reflects this process. It suggests both action and connection. Participation in this sense is both personal and social. But when we engage in a conversation, we somehow recognize in each other something of ourselves which we address. What we recognize has to do with our mutual ability to negotiate meaning. In this experience of mutuality, participation is a source of identity. (pp. 55-56)

He characterized mutual engagement as involving not only individual, but also collaborative competencies (p. 76).

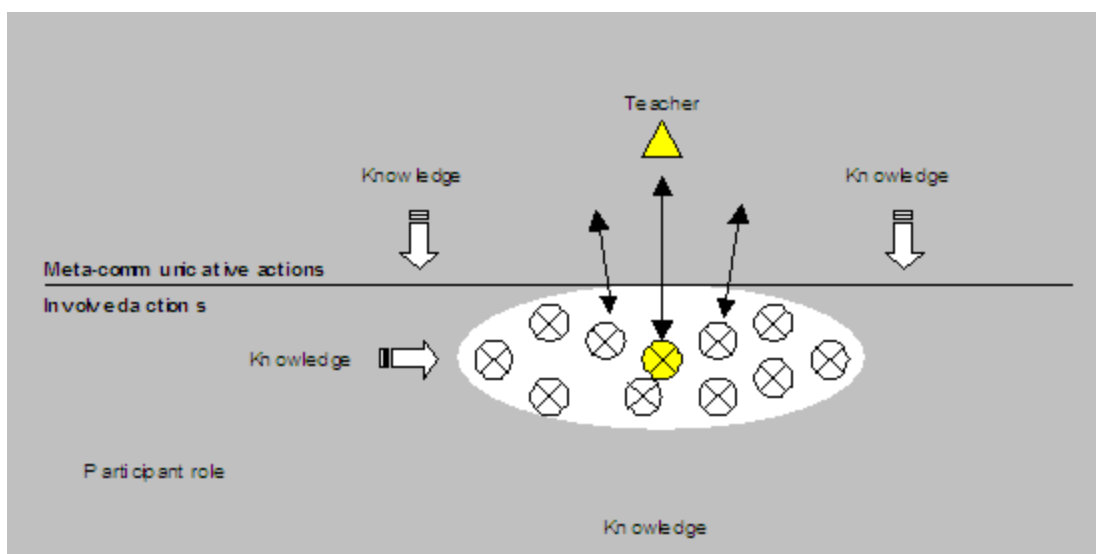
Social presence online, the fundamental element for creation of a CKB process through what Wenger called “negotiation of meaning” is threatened by lack of both “participation” (interaction) and “engagement” (Gunawardena, 1995; Rourke, Anderson, Garrison, & Archer, 1999). Creation of an online presence in networked distributed collaborative learning processes based on participation and mutual engagement in order to ensure the negotiation of meaning is a complex pedagogical challenge (Cornell & Martin, 1997; Sorensen, 1997b).

### A Design Model for Instructional Design (PANEL)

Brown and Davis (2004) argued that a shared culture of an online community begins to develop as interaction starts evolving. In other words, we may say that the challenge we face as instructional designers and teachers when creating models for designs that rest on the personal motivation among learners, born ontologically by our inquisitive and explorative nature as human beings, is the creation and establishment of what could be called “online communities of practice.” Brown and Davis (2004) said the phenomenon of “culture shock” was an essential resource and ingredient for enhancing learning and suggested that it should be utilized directly in the establishment of online communities of practice:

It is our belief that we may use culture shock to enhance learning, because we recognize that the shock of new culture often stimulates cognitive and emotional dissonance, which in turn brings us to a better understanding of others and ourselves. When managed appropriately, the individual can be enabled to reflect on personal behavior and perceptions that had become routine and thus invisible. (p. 239)

On this basis, PANEL (a model for instructional design of collaborative knowledge building processes on the net) was developed. PANEL denotes a learning process centered on CKB and qualified and resourced by the diversity of participants in terms of their individual contributions spawned by their different backgrounds and cultures. Figure 1 is intended to illustrate the main ideas of PANEL.



**Figure 1.** “PANEL”: Pedagogical Approach for Net-Based Distributed Collaborative Learning

It shows a student-centered, open process in which knowledge resources enter dynamically from all sides via the participants, as well as the teacher(s), in a process driven and motivated by participants. It illustrates the dynamic interchange between teacher and learner roles. It also provides a rough indication of how much of the teacher contribution evolves at a metacommunicative level. In sum, the PANEL model possesses the following characteristics:

- It stimulates “participation” and “engagement.”
- It is process oriented.
- It invites assessment of process.
- It denotes an open concept.
- It is participant oriented.
- It draws on student experiences.
- It is, in principle, a lifelong model.
- It operationalizes student experiences.
- It creates participant “ownership.”
- It equals out teacher and learner roles.

### **Research Design and Implementation**

At Aalborg University, Denmark, POPP (Problem-Oriented Project Pedagogy Approach) is the fundamental pedagogical approach used in design of distributed netbased education (Fjuk & Dirckinck-Holmfeld, 1997). POPP is a student-centered approach to learning and instruction, which in principle, rests on collaborative group work and truly integrates the perspectives of the individual students and allows them to take “ownership” in relation to all aspects of the learning process.

POPP is also the fundamental pedagogical approach in the design of our Danish cross-institutional educational initiative, the Master of Science in Information and Communication Technologies (ICT) and Learning (MIL). MIL provides continuing education for people engaged in educational planning and integration of ICT in learning processes at schools and all types of educational institutions, as well as employees with educational responsibilities in different types of organizations. The administration of MIL takes place at Aalborg University, but the curriculum is developed and offered in joint collaboration between five Danish universities (Aalborg University, Aarhus University, Copenhagen Business School, the Danish Pedagogical University, and Roskilde University). The majority of the 40 MIL students are highly qualified teachers at the high school level with extensive university education and high competence within their individual work areas. The cross-institutional approach introduces a cross-cultural approach to pedagogy.

### **Assumptions and Hypothesis**

In this paper the basic assumption is made that online participation and engagement in CKB activities among students (as I have defined them) produce learning. Based on this assumption the following hypothesis was made and tested: An online learning environment that is built on the learning theoretical concepts of Etienne Wenger (1998) and provides mechanisms for students to fully use their diverse cultures, experiences, and competencies, will enhance learning.

### **Method and Model**

With the goal of creating online presence, an experiment was conducted in the context of the first course of this masters program. To address the two problems of insufficient interaction and motivation, the course was designed according to the principles of PANEL.

The course module lasted 5 weeks. It was divided into a period of reading and preparation (2 weeks) and a succeeding period of debate (3 weeks). According to the assignment

given, the students in the 2-week preparation period were required to read the literature individually. The literature was distributed in three themes within the course content: Design of net-based learning processes. These themes corresponded to the names of the three discussion forums in the succeeding period of discussion. The students were asked to distribute a set of roles among the members of their online group, consisting of an average of four students per group. The roles were designed to support group formation and later discussion, so some students were presenters, others were moderators, etc. The description of the roles was clarified in the assignment.

Over the 3 weeks of debate both teacher and students agreed on attending the virtual learning space for a minimum of five times a week. In the debate period the groups each presented a commonly agreed upon problem related to the literature and initiated, conducted, and wrapped up an online discussion with all the peers. In parallel with the discussions, the students and the teacher engaged in metareflections and metacommunication in a specially created metaforum to reflect and discuss the experiences and processes of the students as they evolved. The students were graded on the basis of a mixture of minimum requirements in terms of both quantity and quality that the course designers viewed to be essential to enhance a CKB process (Sorensen & Takle, 2002; Sorensen, Takle, Taber, & Fils, 2002; Stahl, 1999).

## Results

The 3-week debate period generated an enormous amount of engaged participation in CKB (532 contributions, some of which were of the size of half a Web page). Assuming that online participation and engagement in CKB activities among students produces learning, it is fair to say that the experiment has proved itself to be relevant. It was an exciting and interesting activity to follow and participate in the CKB process of the students. Viewed from a teacher perspective, the discussions turned out to be of very good quality (for a set of criteria, see Sorensen & Takle, 2002). The teacher occupied a role in the discussions equal to the students, only in the metaforum the teacher shifted between the role of participant and the role of “the one who knows better.” This pedagogical model, however, did not reduce the amount of work for the teacher. On the contrary, while it was interesting to participate and follow the discussions, it was quite a demanding job to read, relate to, and comment on so many reflective and, often, long comments. The discussions were truly student-centered and student-governed in that they produced an enormous amount of relevant collaboratively developed student initiatives, student perspectives, and student experiences. The course evaluation was generally good and produced the following *positive* comments. Many of these comments align with the characteristics of the PANEL model listed earlier. The comments at the end of the following list also illustrate students’ perceptions of the value of intercultural learning:

- PANEL: It stimulated participation and engagement
  - “It has certainly moved me forward. I have gained insight in and experience and have overcome my feeling of inferiority.”
- PANEL: It is process oriented
  - “A positive process, well structured with respect to roles as a means of establishing interaction.”
  - “The whole process has been a positive experience.”
  - “Exiting to use the medium [web] on its own premises.”
- PANEL: It invites assessment of processes
  - “The use of roles was good; it provided more clarity.”

- PANEL: It denotes an open concept
  - “The content and the organization in roles (moderator, presenter, opponent, etc.) have been positive.”
  - “Good that the roles were not too tight.”
  - “Exiting to try out different possibilities.”
  - “Possibility for improvisation a big strength.”
- PANEL: It equalizes out teacher and learner roles
  - “Good that the discussions were not too guided.”
- PANEL: It operationalizes student experiences
  - “It was a quality that many of the aspects/resources of the participants were operationalized.”
  - “One was able to use one’s own resources.”
- PANEL: It creates participant ownership
  - “Beyond comparison, I have gained the largest professional and personal benefit.”
  - “I have become ready to take on tasks that I would never have dared to accept before.”
  - “Good comradeships.”
- PANEL: It is participant orientated (intercultural, too)
  - “The cross-institutional structure means (contrary to other educations) that one gets ‘hands-on’ experience with educational cultures.”
  - “Fellow students with different experiences make the shared ‘database’ big and increases the value of discussions, group work etc.”
- PANEL: It is, in principle, a lifelong model
  - “Our ability to argue and formulate ourselves in writing improved.”

There were also a few *critical* voices toward the pedagogical model. The following comments show how some participants found it hard to adapt to work according to a model in which the students and their initiative are in focus and the teacher is stepping back to the periphery. A few students clearly found it difficult to leave the old delivery paradigm:

- “Provoking comments could be at the cost of true content.”
- “One student wants more teacher profile in the discussion.”
- “Difficult to sum up.”
- “Tight versus loose guiding?”
- “Number of contributions and reactions could cause stress.”
- “Qualified contributions demands overview.”

Overall, the personal motivation of the students was high and demonstrated a mutual engagement in the discussions far beyond the minimum requirements in terms of both quantity and quality. Only 4 of 42 students did not exceed the required amount of comments in the course interaction.

## Conclusions

This paper has dealt with the overall question of how teachers and instructional designers – in particular within the area of continuing education – should approach the challenge

of design of intercultural, personally motivated collaborative learning processes online. Assuming that participation and engagement in online CKB activities produces learning and that online learning designs are enhanced through teachers and designers consciously basing their instructional designs on learning theory (through the use of PANEL) and intercultural perspectives, the results from this experiment are overall positive. A high amount of inquisitive and explorative communicative behaviour among participants – a factor identified by Brown and Davis (2004) as vital for improving intercultural communication – was a clear characteristic of the course.

Some of the evaluation comments from students after the course strongly support the mutual, intercultural, bottom-up learning value of the instructional design model. Note that some of these students have already adopted the teaching and learning methods that they experienced in the course:

- "Learning about online learning online has been an overall good experience, and I believe that no papers or lectures could have provided the same level of understanding, and I feel actually able to identify with the student's situation as well as the teacher's."
- "The Master course has given inspiration and lots of new knowledge to add to my virtual work. It has been a privilege to have the opportunity to learn again and to do it in professional surroundings."
- "I will never forget my enthusiasm for the methods explored in this course, and I have applied some of them myself with success. And I will never forget the role and importance of the moderator/facilitator of the course."

It provides strong indication that by basing design on the learning theoretical concepts (participation and engagement) of Etienne Wenger (1998) and personal motivation, as suggested by Brown and Davis (2004), and by operationalizing student diversities, experiences, and competencies, CKB online (participation) increases measurably – through the stimulation of student ownership, relevance, and motivation (engagement). The two main intentions to create participation (interaction and online presence) and engagement (motivation through the operationalization of the participants' experiences) seem to have been fulfilled, and learning has been enhanced.

### **Future Perspectives**

When aiming at enhancing quality in Internet based distributed collaborative learning, it is necessary for learners as well as teachers to navigate within a different pedagogical paradigm than in a traditional face-to-face setting.

The changes in design necessary to enhance quality may be radical. Instead of navigating in a predictable pedagogical virtual universe where teacher roles, teacher guidance, and fixed resources are decided upon in advance, teacher educators are moving toward a virtual pedagogical paradigm marked by an instructional need to act, interact, and collaborate on a more equal basis. We are facing a new stage of learning on which fixed entities become dynamic and unpredictable, and in which new instructional competencies are essential, including the ability to improvise in a chaotic environment. The new paradigm needs a broader pedagogical perspective of the teacher, including a wider context accompanied by awareness of the intercultural potential. Even though the core competence is of pedagogical nature, it is necessary for both teacher and designer to obtain and utilize a wider and more holistic set of qualifications on which to base pedagogical considerations, actions, and design decisions. This paper illustrates an effective way for educators to learn important strategies, such as moderation and



facilitation, while guided by an expert colearner as well as teacher. As one student commented, "Exciting to use the medium on its own premises."

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