A Theoretical Framework for Designing Online Master Communities of Practice

Lone Dirckinck-Holmfeld, Elsebeth K. Sorensen, Thomas Ryberg and Lillian Buus
Aalborg University
lone@hum.auc.dk, eks@hum.auc.dk,ryberg@hum.auc.dk,lillian@hum.auc.dk

INTRODUCTION

The introduction of the master (MS) format on the European market of education and the emphasis on its format as suited for international collaboration in education has spawned the birth of many master educations, founded and unfolding in virtual learning environments on the web. But not all of these master educations have proved to be equally successful in terms of continuously attracting waves of learners, thus many of them are likely to have only a short lifetime. There may be several reasons for this, one of them being related to the design of the online learning environment used as context for the networked e-learning master community.

But the term "design" is a broad one. What exactly are those design features in the implementation of such master communities, which seems essential in terms of determining the level of success of a given online master program?

Based theoretically on key notions from Etienne Wenger's learning theory (Wenger, 1998), this paper sets out, analytically and holistically, to explore and capture the pedagogic-didactic features of design of a networked e-learning master community, Master in ICT and Learning (MIL), designed from and within a Danish educational culture and context. The aim of the paper is, through an analysis of MIL, to understand and document the specific features of the design of the networked e-learning master community, which seem pertinent to the forming of well functioning networked e-learning master communities. The paper concludes, on the basis of the findings from our analysis, with a tentatively suggested framework for design of well functioning networked e-learning master communities. Our perspective as researchers is one combined by our multiple roles as managers, designers and teachers of the program.

THEORETICAL PERSPECTIVE

The theoretical perspective behind the design of MIL draws upon several sources. The overall inspiration for the design of the virtual learning environment (VLE) rests upon pragmatism, and the understanding that meaning is created through acting in the world (Dewey, 1916). In the case of MIL this is organized through the overall concept, problem oriented project pedagogy (Dirckinck-Holmfeld 2002). Moreover, we are inspired by social learning theory and the concept of communities of practice (Wenger 1998), which provides insights both in the mechanism for designing learning communities and the cultivating of these (Wenger 2000). Finally, we draw upon Brenda Laurels (Laurel, 1993) metaphor of theatre and drama, wherefrom we have derived concepts of dramaturgy, melody and rhythm of a VLE (Laurel, 1993; Fjuk & Sorensen 1997, Bygholm & Dirckinck-Holmfeld 1999 2. edition; Dirckinck-Holmfeld 2000), which also seems to be central in order to understand and support the practice of a virtual learning community.

In this paper, we are especially focused on critically to review and justify the design of the master program in the light of theoretical concepts derived from the work of Wenger.

We are especially focusing on the following concepts:

- *The development of communities* as a combination of three complementary aspects: a sense of joint enterprise. Mutual engagement and the opportunities to build relationships, trust, and personal identities, and third the evolvement of a shared repertoire of concepts, tools, language and stories, and the sensitivities that will embody the distinctive knowledge of the community and become a unique resource for further learning (Wenger, 1998)
- *The notion of multiple membership* in order to use engagement across boundaries to create learning (Wenger, 1998)

- *The notion of continuous learning trajectories and change of identities* in order to understand more deeply the relation between the learning environment and the change of the single learners identity and practice as a response to the participation in the learning environment (Wenger 1998).

Master in ICT & Learning

At Aalborg University, Denmark, POPP (Problem-Oriented Project Pedagogy)[12] is the overall pedagogical approach used in the design of distributed net-based education (Fjuk and Dirckinck-Holmfeld 1997). POPP is also the fundamental pedagogical approach in the design of the Danish cross-institutional, educational initiative, the MS in ICT and Learning (MIL) (Sorensen, 2003). MIL provides continuing education for working adults 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 selected departments of five Danish universities (Aalborg University, Aarhus University, Copenhagen Business School, the Danish Pedagogical University, and Roskilde University). The shared educational endeavour is the result a ten years of research collaboration between these departments.

MIL is a two-year (half-time) master education in ICT and Learning with 40-50 students pr. year group. It is structured in three categories of studies: four modules (each consisting of three to four courses), one project work, and one master thesis. The way these elements are structured over time is mirrored in figure 1 below:

Fig. 1: The structure of the Danish Master in ICT and Learning (Sorensen 2003)

<table>
<tr><td rowspan="2">Fall semester 1</td><td>MODULE 1:
ICT-Based Learning Processes

(required: 3 out of 4 courses)</td><td>MODULE 2:
ICT and Interaction Design

(required: 3 out of 3 courses)</td><td>15 ECTS</td></tr>
<tr><td colspan="2">Technology module 1</td><td>5 ECTS</td></tr>
<tr><td>Spring semester 1</td><td colspan="2">PROJECT WORK</td><td>10 ECTS</td></tr>
<tr><td rowspan="2">Fall semester 2</td><td>MODULE 3:
ICT and Organizational Learning Processes

(required: 3 out of 3 courses)</td><td>MODULE 4:
ICT and Didactic Design

(required: 3 out of 3 courses)</td><td>15 ECTS</td></tr>
<tr><td colspan="2">Technology module 2</td><td></td></tr>
<tr><td>Spring semester 2</td><td colspan="2">MASTER THESIS</td><td>30 ECTS</td></tr>
</table>

Research Design

As a result of our overall view on learning as a matter of change of identities through engagement in communities of practice, and our focus on maintaining continuous learning trajectories in a dynamic (dual) learning context, we form the hypothesis that:

12 POPP is a student-centered approach to learning and instruction, which, in principle, rests on problem orientation and collaborative group work. It truly integrates the perspectives of the individual participants and allows them to take "ownership" in relation to all aspects of the learning process (Sorensen 2003).

- Learning will take place as a consequence of student engagement in networked e-learning master communities, which are designed in ways that allow for:
- Dynamic (dual) participation and multiple membership, organized around joint enterprises.
- The opportunity to build mutual engagement, interdependencies and a shared repertoire

In our hypothesis we assume that:

- change of identity is a sign of "learning" (e.g. documented by the statements from the master students, who have gone through the MIL learning trajectory and finished their master studies).
- Engagement and active participation in networked e-learning activities will "produce learning"

METHODOLOGY

We are using a dual methodology. We have partly adopted an ethnographic inspired approach in order to understand the situated aspects of the VLE and the participant's point of view, and partly adopted a quantitative structural analytical approach using the documents and the system data in order to describe the manifest didactical design as well as the participation structure of the VLE.

Analysis of MIL

Learning trajectories and change of identity

An important aspect of MIL is the notion of multi-membership and the interaction between different professional identities and contexts. It is our claim that the students, who engage in MIL change on many levels:

- Change of practice
- Change of identity
- Change of membership
- Change of trajectory

MIL consists of a complex pattern of interweaved professional identities and memberships in a diversity of practices. The students are all professionals and engaged in different practices at their workplaces and at home. The students are from both the private sector (e.g. IT-companies) and from the educational sector, some of the students are former academics, others are not. Through the engagement in course discussions, project work and assignments the students are confronted with a mixture of professional identities, which urges the students to negotiate anew their current multiple practices and experiences – but also to negotiate a new shared practice within the academic practice, which for some of the participants is unknown.

Conscious effort is put into involving students in other academic activities than they encounter as 'ordinary' students e.g. students are invited to familiarise themselves with academic contexts such as conferences and international research projects. In this way students gradually become members of the academic community. Furthermore the MIL education is not disengaged and neutral in relation to the social and political reality, rather MIL seeks to strengthen critical, democratic and change oriented values and awareness in relation to ICT and learning. Some students do adopt this aspect, which result in a change of their professional practice towards more focus on collaborative pedagogies and socio-constructivist understandings of learning.

That change of identity is an inherent potential of the learning trajectories enabled by the democratic and non-hierarchical design of the MIL master education is illustrated by the majority of the evaluating comments provided by the MIL students who have finished their master studies (Table 1, Student evaluation 2003):

1.	As a whole the study must be said to have fulfilled all my expectations to the education
2.	Very large benefit… - beyond comparison that of my different educations from which I have gained the largest professional/personal benefit
3.	To me MIL has to a very large degree been a process of formation – for good and bad :-)
4.	I have benefited very much from the education that has been very relevant and close to practice
5.	It has certainly been an education that has moved me forward. I have gained insight in working methods at an academic level and thereby I have overcome my educational feeling of inferiority (in the daily life I am associated with a lot of academics). I have become ready to take on tasks that I would never before MIL have dared to accept (e.g. doing a presentation on Problem Based Learning)
6.	The study area of my thesis has meant something to my future career
7.	Beneficial
8.	Exciting assignments/projects
9.	Good comradeships
10.	Good well functioning arrangements
11.	Great planning (possibility for improvisation a big strength)
12.	Beneficial with teachers very rich on initiative and from various institutions
13.	Extremely good with seminars
14.	Good that groups were formed from the start
15.	Possibility of working in depths with the different subjects
16.	Possibility for networking
17.	Good theoretical teaching and foundation
18.	Great variety in the study
19.	Good mixture between theory and practice
20.	The structure of the subjects - the modules supplement each other well – both professionally and pedagogically
21.	The cross-institutional structure means (contrary to other educations) that one gets 'hands-on' experience with educational cultures
22.	Good possibilities for testing out theories in practice
23.	The exemplary structure of many of the courses e.g. when we work with portfolios we do so in a portfolio environment
24.	Fellow students with different experiences make the shared 'database' big and increases the value of discussions, group work etc.
25.	Freedom of choice in relation to assignments/projects ensures that everybody can select something that is relevant to them
26.	The education is based on collaboration
27.	The dynamics between process and product was – seen in large perspective – very beneficial

The changes in identity and trajectory of the students are not only due to the didactical design of MIL but rest firmly in the students level of engagement in dialogues, course discussions and project work. However, the didactical design has been designed to encourage this participation.

Engagement in interactions and change of identity

To Wenger learning takes place through engagement in actions and interactions over time, through which it forms individual learning trajectories and reproduces and transforms the social structure in which it is situated. Engagement in ongoing interactions is thought to be the carrier of the development and transformation of identities.

MIL is designed as a dual modes learning environment. Four presence seminars take place during the year, and the programme is each year finalised with a presence examination and a formal social event.[13]

13 The overall design of the virtual learning environment can be found in the article: Dirckinck-Holmfeld, L. (2002). Designing Virtual Learning Environments Based on Problem Oriented Project Pedagogy. Learning in Virtual Environments. L. Dirckinck-Holmfeld and B. Fibiger. Frederiksberg C, Samfundslitteratur Press. The presence

In order to understand change of identity as a consequence of participating in MIL both the presence activities as well as the virtual activities should be considered. In this paper, however due to practical reasons, we will only focus on selected virtual activities.

The virtual learning environment consist all together of around 250 conferences and 15 course templates. The conferences may be divided in: course activities, project activities, research socialising activities, organisational activities. In this paper, we have only focused upon the course activities (19 conferences all together), taking place during the fall semester.

As to illustrate engagement in interactions over time in the virtual course activities, we have quantified the number of messages pr. day in the following graphs (Fig. 2):

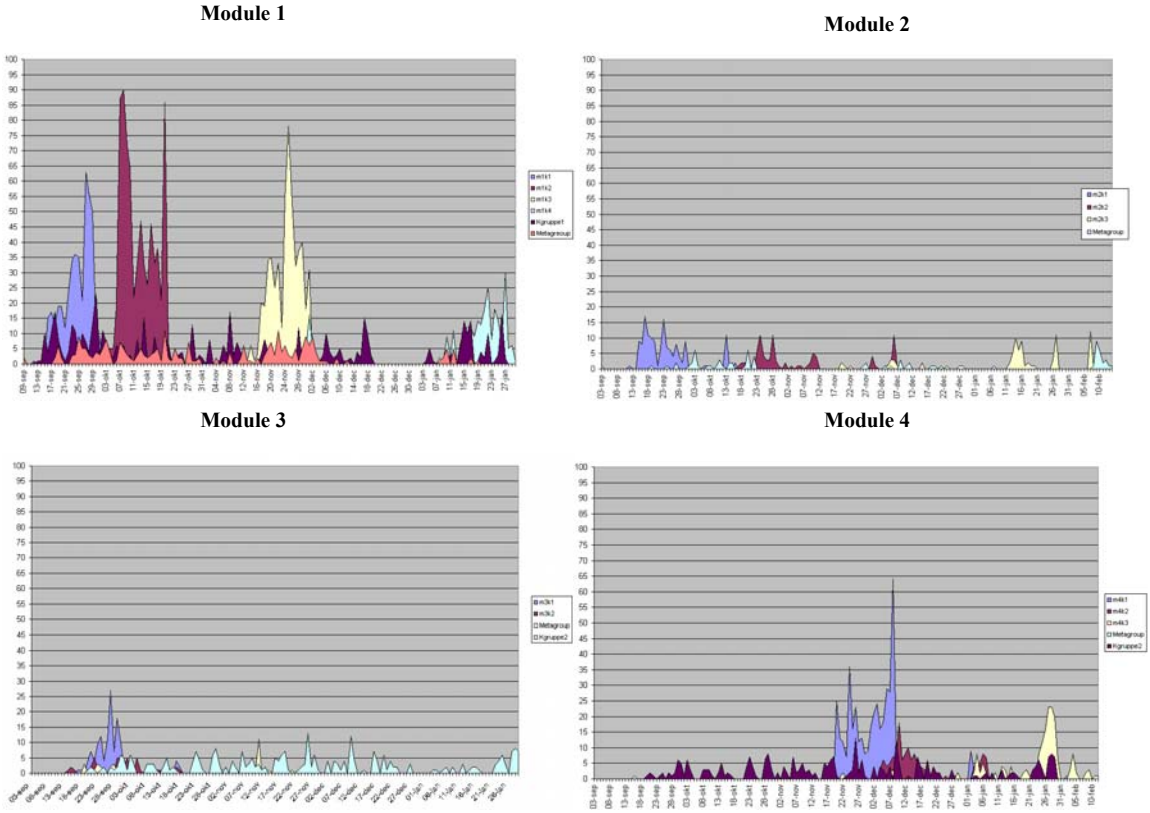

Fig. 2: Interaction over time: Module 1-4, courses 1-4 + 1 Course group and 1 Meta conference

The figures illustrate the interaction within the four modules of MIL, two modules (1 & 2) relates to the 1st year, and two modules (3 & 4) relates to the 2nd year. The figures show: The courses within each module, a course group, and a meta conference[14]. The course interactions take place within specific and pre-planned periods of time, whereas the meta conference and the course groups reflect the students interactions both during and between the courses.

The modules illustrate different patterns of interaction within the course activities. The first module (module 1), which the student meets when they start the master is based on dialogical principles (Sorensen and Takle 2003). Module 2 runs in parallel. The didactics is more traditional based on small assignments in groups. Module 3 & 4 (the second year) is based on a mixed didactics, some courses, the one with high interactivity, is based on a dialogical concept, while the other courses are based on different types of assignments in groups. The

seminar plays an important role in building up trust and mutual engagement among the participants, they allow for other modes of learning activities, and they are important milestones and highlights in order to establish remarkable events, start and finish a module etc. The seminars take place at the different partner universities, which helps the students to identify different university learning cultures.

14 Course groups are created and maintained by the students for various purposes (course work, assignments, special interests etc.). In the first year, the students established nine course groups to support module 1 and 2. The one selected in the figure is based on an average number of messages (only showed in module 1). In the second year, the students establish course groups related to each module. The one selected for each module is also based on an average number of messages. Meta conferences are conferences reserved for reflections on the courses, experiences and comments on learning online etc. It should be noted that most of course no. 4 in Module 1 was run in another virtual environment, so the graph does not reflect the actual interaction in the course.

interaction pattern in the meta conferences and course conferences illustrate continuously activity through out the module and not confined to course work, which could potentially leave an interaction gap between the courses.

The quantitative registration of the interaction doesn't tell anything about the quality of the interaction. However it gives an overview of the different course activities, the work in the course groups and the illustration of different didactics. Furthermore, the figure tells us, that there is a realistic interplay between the different modes of interaction. Starting very ambitious in the fall semester (module 1 in parallel with the less interactive module 2), and ending quite ambitious in fall semester (module 4). As so there is throughout the fall-semester a rhythm and melody for the interaction, a rhythm, which allow for participation but also more quiet periods for reflections. This rhythm is supported by the presence seminars (September 12-14, November 14-16 and January 31 – 2 of February) in the way, that during the presence seminars it's very quiet in the virtual environments, while interaction takes place in the presence-learning environment. The figures therefore illustrate, that it seems to be the requirement of the course, which influence the interaction patterns and not the presence seminars. This has also been the conclusion of (Sorensen & Ó Murchú, 2003). This is interesting in itself, because it shows that the design of the courses in it selves motivates for interactions and participation.

We believe the ongoing interaction in the virtual learning environment to be an important factor where the students mutually engage in dialogues and assignments. We encourage students to relate their course work and assignments to their own enterprises and own experiences. In the courses the students are confronted partly with their professors[15] that represent the academic community and practices, and partly with their peers. These frequents interactions between the students, and between professors and students – in the course foray as well in the small course groups - furnishes the possibility for them to reflect upon and renegotiate their understanding of the academic area of ICT and learning as well as their professional practices at the same time as they are participating in the construction of an emerging shared academic practice, in the light of their various professional backgrounds.

CONCLUDING REMARKS

For the purpose of identification of the features pertinent to a well functioning design, we establish, from our explorative methodological approach, a set of criteria of quality that arise in our analysis of the capturing of these features of the MIL master program. The descriptive analysis of the interaction patterns suggests designing for different didactics demanding different interaction activities of the students. In that the meta conferences and the course groups seems to play an important role of integrating the course elements, and to expand the work with the course elements. Another feature is the interplay and integration of interaction in the virtual environment and the presence seminars. The dialogue based, collaborative and open design of MIL learning environment seems in this Danish context to support dynamic (dual) participation and multiple memberships, organised around joint enterprises. And it seems to offer opportunities of building mutual engagement and interdependencies and a genuine "blended" learning community with multiple memberships and the opportunities for change.

Acknowledgements

We wish to thank Nina Lilholt (6.semester student at Human Centered Informatics – Department of Communication) for her help with collecting the data needed for the graphs.

References

Bygholm, A. and L. Dirckinck-Holmfeld (1999 2. edition). Pædagogik i det virtuelle læremiljø - metodiske overvejelser · (Pedagogics in the virtual learning environment - methodological reflections). Læring og Multimedier. O. Danielsen, L. Dirckinck-Holmfeld, B. H. Sørensen, J. Nielsen and B. Fibiger. Aalborg, Aalborg Universitetsforlag.

Dewey, J. (1916). Democracy and Education. New York, Free Press , Macmillan Company.

15 MIL is a research-based education. Senior professors (and to a lesser degree junior professors) conducting research are doing the teaching – both the course work and the facilitating of the project work.

Dirckinck-Holmfeld, L. (2000). Virtuelle læringsmiljøer på et projektpædagogisk grundlag (Virtual learning environments on a project pedagogical basis). Universiteter i Udvikling - IKT og Undervisning, Samfunds-litteratur. S. Heilesen. Frederiksberg, Samfundslitteratur Press.

Dirckinck-Holmfeld, L. (2002). Designing Virtual Learning Environments Based on Problem Oriented Project Pedagogy. Learning in Virtual Environments. L. Dirckinck-Holmfeld and B. Fibiger. Frederiksberg C, Samfundslitteratur Press.

Fjuk, A. and L. Dirckinck-Holmfeld (1997). "Articulation of Actions in Distributed Collaborative Learning." Scandinavian Journal of Information Systems.

Fjuk, A. & Sorensen, .E. K. (1997): Drama as a Metaphor for the Design of Situated, Collaborative, Distributed Learning. Published in European Journal of Open and Distance Learning (EURODL). http://www.eurodl.org

Laurel, B. (1993). Computers as Theatre, Addison-Wesley Publishing Company.

MIL, Master in ICT and Learning: www.hum.auc.dk/mil

Sorensen, E. K. (2003). Designing for Online Dialogue and Discussion in Collaborative Knowledge Building Networks (SOFF report No. 1). Tromsoe, Norway: SOFF – Centralorganet for fleksibel laering i Hoegre utdanning, pp. 21-34.

Sorensen, E. K. and G. S. Takle (2003). Learning through Discussion and Dialogue in Computer Supported Collaborative Networks. Society for Information Technology and Teacher Education International Conference 2003(1), [Online]. Available: http://dl.aace.org/12261 . Vol. 2003, Issue. 1, 2003. pp. 2504-2510.

Sorensen, E.K. & Ó Murchú, D. (2003). ”Online Learning Communities of Practice: The Challenge of Design across Cultures and National Borders. In the Proceedings of The Second International Conference on Multimedia and Information & Communication Technologies in Education (m-ICTE 2003), held in Badajoz, Spain, December 3-6, 2003. http://www.formatex.org/micte2003/finallist.htm

Student evaluations from MIL, 2003.

Wenger, E. (1998). Communities of Practice - Learning, Meaning, and Identity. New York, Cambridge University Press.

Wenger, E. (2000). Communities of Practice: The key to Knowledge Strategy. Knowledge and Communities. E. L. Lesser, Fontaine, Michael A., Slusher, Jason A. Boston, Butterworth Heinemann.