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ABSTRACT

In times of financial restrictions, the demand for more efficiency and effectiveness in the higher education system is often connected to the potential of tele-supported university teaching. At the Institute of Law and Computer Sciences of the Saarland University, international online courses have been offered regularly since 1996. The didactic concept is communication-oriented and is based to a vast extent on discussions and group work via the exchange of electronic messages through the World Wide Web. Technical specialties, like an extensive media integration, were not incorporated and the programming was reduced to a necessary medium. Nonetheless, a vast investment of time during the development and the realization of such online courses had to be noticed mainly due to organizational and support activities. This paper looks at the design of an online learning environment, focusing on the collaborative aspects, both from an educator's viewpoint and from a student's viewpoint. The design is based on socially constructed needs with flexibility as a main concern. (Contains 10 references.) (AEF)

Designing Collaborative Teaching and Learning in Virtual Environments for Large Scale International Participation

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Abstract: This paper looks at the design of an Online Learning environment focusing on the collaborative aspects, both from an educator's viewpoint and from a student's viewpoint. The design is based on socially constructed needs with flexibility as main concern.

Introduction

In times of financial restrictions, the demand for more efficiency and effectiveness in the Higher Education system is often connected to the potential of tele-supported university teaching. Whereas it is becoming more popular to use the Internet as the technical platform for the distribution of on-line study offers, a lot of surveys, (self-) descriptions, reports, etc., promote the thesis of almost unlimited possibilities in education that just have to be implemented. Frequently, a positive view is held which pushes the discussion of problematic areas of (interactive) on-line offers into the background. The gain in relation to the effort for development and realisation is seldom mentioned.

At the Institute of Law and Computer Sciences (Institut für Rechtsinformatik) of the Saarland University (Universität des Saarlandes), international on-line courses on the Internet have been offered regularly since 1996 (http://seminar.jura.uni-sb.de). The didactic concept is communication-oriented and is based to a vast extent on discussions and group work via the exchange of electronic messages through the WWW. Technical specialities, like an extensive media integration (e.g. audio/video), were not incorporated and the programming was reduced to a necessary minimum. Nonetheless, a vast investment of time during the development and the realisation of such on-line courses had to be noticed mainly due to organisational and support activities.

Implementation

Submitted works and responses of the participants show that it is a valuable course. The rising acceptance hints to the fact that the people value the advantages of studying independently of time and place and they appreciate the communication-oriented approach where participants have to be actively involved and are taken care of daily. Experience also shows that it is necessary to count in the economic factor as well. If one wants to try to simulate all-important elements of conventional teaching in a virtual environment, then new requirements have to be followed:

- the development and implementation of a course with specific didactic concept is usually more work intensive than in ordinary courses. Details have to be prepared before the course, the sequence and interaction have to be planned completely.
- the teaching concept has to come with a technical realisation concept, which makes forward planning and test runs necessary.

- the organisation is extensive: processing of requests, collection of participants data, log-in and user identification distribution and updating data require much more time.
- the support of participants is done around the clock, even on weekends and cannot be seen to be an inadequate relation to that of conventional seminars. With the number of messages reading and answering them exceeds the time available for conventional courses including office hours. It is noticeable that the students have higher expectation in their support than usually, the reasons still have to be empirically researched.
- technical, didactic, and content developments require the delegation of assignments which creates new dependencies and requires a lot of co-ordination efforts. Although high international participation lifts the quality level, limitation of participant numbers has to be considered, and the question of where to find additional resources has to reconsidered. Since the course offer is not limited to students of the particular university, sharing of cost with the other has to be discussed. Whereas this is already done in other countries, the German university system does not offer the necessary legal base for such actions yet.

A reasonable conclusion of this is that there currently are a need for integrative concepts for the implementation of open and distance learning via IT in Higher Education that can demonstrate a methodology of good practice for educational needs. Problems relating to this lack of a full and encompassing concept has to be seen from different perspectives and within different contexts of education. The implementation therefore depends from pedagogical, sociological, legal, technological and organisational as well as other disciplines.

Taking these obstacles into account co-operation among institutions was needed in integrating different domains of expertise in research and demonstrating a collaborative approach for the implementation of a model for Virtual studies in Higher Education.

One advantage of online courses is the potential for communication, collaboration, and the constant exchange of knowledge between students and educators, which brings them closer to (and perhaps supersedes) "real life" teaching. The Online Seminars has opened up new possibilities for students and teachers, and permit interdisciplinary and international collaboration. Our experience also points in the direction of that online teaching with international cooperation and participation are far more time and personnel intensive than regular courses.

The design of collaborative learning

Collaboration and co-operation needs to be designed on an institutional level too. Co-operation involves determining the settings and the implementation. Collaboration is applied practice in the field.

The online seminar is a co-operative international venture. Hence, the results of the analysis faze helps guide the roles of each of the co-operating institutions dependent on the focus, resources, personnel, and disciplines of those institutions. Currently (Summer 2000) this co-operative venture involves collaboration between Higher Education institutions in Germany, Austria, Sweden and Kazakhstan. Each of these institutions may have additional collaboration from local institutions. Co-operative decisions are based on common educational and research interests, competence, persons in charge, technical resources and the cultural background. Educational interests can therefore be implemented in ways not known before IT and the Internet were available.

Collaboration

Collaboration takes place among students, between students and teams, and among team-members. Student collaboration needs to be organised and co-ordinated too. No learning environments are known in Higher Education, where students meet voluntarily in order to collaborate for performing certain certified tasks.

Taking a closer look at the role of collaboration will show considerations to be globally viewed on four levels. These are:
- on the students level within the course
- on the team level within the course
- on a local level and finally
- on an institutional level: collaboration between international universities.

The Online Seminar-environment teams consist of 30 individuals from many different countries. These team members are lecturers, agents, volunteers, former seminar participants and students doing research work. Most of today's volunteers in the moderation of group discussions are former students of the seminar. Several tightly bonded groups have been formed as a result of the seminar on varying levels. For example, "Cyber Grannies" was formed by some of the student cohort during the 1999 seminar. Learning processes are also encouraged for the team – currently we are developing training for moderators.

Learning within the environment is structured to be multi-levelled and complex. Learners are learning from the team, but also from other learners. The team is learning from learners and other team members and participating institutions are learning from learners, teams and other institutions. This complex web of different learning levels are intimately related to the collaboration taking place across all these levels. Meta-learning is built into the design. Feedback has shown that learners rate this collaboration structure highly.

The design

The issue of designing an environment for collaborative learning are complex and varied. Some of the requirements needed to attend to are motivation and affording interactivity. A vast investment of time and energy during the design, development and the realisation of such online courses are mandated to ensure organisational and support activities to ward off potential problems. One central role in the Online Seminar is moderators for group work, the moderator to a very high degree are in fact mentors. Mentors not only in the task at hand but also in handling the media itself. Online VLEs present technical, transitional and pedagogical concerns. As Harasim [4] notes, "an online mentor is a professional in a particular subject area who provides on-going feedback until the apprentice (student) masters the learning task. At that point the mentor fades away, and the apprentice engages in the exploration of expert practice." The VLE presents a new atmosphere that the student and teacher must learn how to navigate. This melding of mentorship and purpose begins to reshape the face of learning and education. Without the active help of professors and lecturers (occupied with content support, management and didactics) as well as a number of student moderators who volunteered to assist during the online course the high goals set for the course could not heave been reached.

In an online environment, you can expect mentoring to take on a new dimension. Here we are challenged to mentor in ways that Feuerstein [3] and others define as mediation. Dialogue and inquiry become a powerful medium for collaborative learning. Discussion begins to carry a flow a meaning. Threads of conversation can be woven together. Opinions and points of view become circulated as observations, assumptions and interpretations become visible. Effective guidance and mentoring can be achieved through selective intervention. A skilled moderator is a mentor who can keep the fragile balance between advocacy and inquiry. The moderator must facilitate rather than dominate the discussion. When we focus on Vygotskys [8] [9] idea of the learner's zone of proximal development, scaffolding, and dialogue, we have to turn our attention to fostering learning via virtual discussions, using strategies that include "voice", address learning and writing styles, and utilise Socratic dialogue. These ideas require us to tend to both the individual and group learning process. If we want to further online discourse, it is important not to forget that this learning process is complex, social and interactive. Research in social collaboration and negotiation in the vein of Slavin [7] and others, calls attention to the design and support of what these learning environments require. Responsibilities for discussion become shared, feedback becomes integral, and all participants, including the moderator, are equal. Both instructor and learner are challenged to grow and develop in this environment. Instructors grow to become moderators and guides and students grow as learners.

Online collaboration as well as effective moderating *must* be designed if it is to have comparable impact to face-to-face instruction. Through conscious effort and application, "virtual" moderators can bring voice and tone into an otherwise sterile and distant environment, accompanying the learner as a reflective guide or maybe even much like a personal muse. Moderators are mediators and facilitators; generative guides and conceptual facilitators. The same issues that can be a weakness in a virtual learning environment can be exploited creatively to make learning come alive.

Active learning is at the heart of the design of the Online Seminar. Designing activities that ensure active participation is part of the moderation and discussion process. Facilitating the discussion is one aspect. Another aspect is making the discussants responsible for their own learning by sharing the responsibility and leading group discussion and work. All participants in the course are provided the opportunity to experience being facilitators in

discussion, team leaders, presenters of information, observers, and all are responsible to provide feedback and input into the learning process. However, for any of this to occur, a certain amount of control needs to be relinquished and turned over to the group. Moderators must stay in the shadows allowing the learner to shine.

However, perhaps at the heart of design is the feedback, feedback that the moderator needs to provide in order to support the learning process. Feedback that promotes and encourages continued growth as a learner and encourages collaboration. Substantive feedback not only needs to be built into the course design, but also needs to be modelled by the facilitators if we are to expect quality feedback from students. Feedback needs to be constructive. Connections need to form between participants; commonalties as well as differences need to be discussed. A shared interdependence creates a collaborative environment.

Our goal was that course design and development would reflect a commitment to high quality related to state of the art research for teaching and learning. Hence, "active learning" and a focus on the "communicative process" between and among students and teachers were considered to be essential as we investigated designing "rich online learning communities". Since it is a virtual environment to be implemented based on the Internet, it was clear that quality could be enhanced if the potentials of the Internet could be exploited. Those potentials include information and communication potential; the flexibility of time and space of learning; and access for everyone without the need of additional financial investments in equipment or tele-communication.

As McGreal [6] notes that commercially available integrated distributed learning environments such as CourseInfo (http://www.blackboard.com/) are popular given: the lack of sustained yields for individual course development within curriculum, the high time investment for instructors, and the lack of a supportive technology infrastructure. Despite the administrative and implementation advantages these course management systems offer, these packages lessen the authoring power of the instructor, assume specific pedagogical approaches, confine in some ways the delivery of instruction, and limit the control of the instructor over the learning environment. Given our requirements and needs, we wanted control over the tools and delivery method to be able to be responsive and adaptive to learner and instructor needs relative to the content being presented.

We wanted the learning environment to be able to evolve and grow. We also wanted the environment to be learner centred and learner driven – hence our focus on creating community and a collaborative learning environment. Subsequently design looked to the aforementioned needs for input rather than limiting the design and development to adhere to a singular learning theory. Rather, we focused on developing a set of tools for the learners and designed how we asked that learner to engage the information to create the kind of interactivity and the level of ownership needed within the learning process. We intended to create a "rich" learning environment, which Wilson describes as a setting in which the student is "engaged in multiple activities in pursuit of multiple learning goals, with a teacher serving the role of coach or facilitator" [10].

Since the idea is the building of "learning communities" to achieve better and more active learning processes by the students a definition of constructivist learning environments given by Wilson [10] would fit best to the Online Seminar environment: "a place where learners may work together and support each other as they use a variety of tools and information resources in their guided pursuit of learning goals and problem-solving activities". However, not all tasks performed within the courses are constructivist. It is apparent within the design the influences of other learning theories and pedagogical assumptions e.g. such as cognitivism and social constructivism. Cunningham et al. [2] listed several principles for the design of a learning environment: a) provide experience with the knowledge construction process b) provide experience in and appreciation for multiple perspectives c) embed learning in realistic and relevant contexts d) encourage ownership and voice in the learning process e) embed learning in social experience f) encourage the use of multiple modes of representation g) encourage self-awareness of the knowledge construction process.

Results

Learner profile of participants in the 1999 summer term Online Seminar in short are; 224 students from 46 different universities, 19 academic specialties were represented from humanities to technology, 88 participants held some form of employment, 37 countries were represented an the ages ranged from 20 to 64. Preliminary statistics for the summer 2000 seminar is 521 participants registering, more then 30 countries from all continents are represented.

As the seminar has evolved so has our awareness of the importance of this intellectual role of the moderator. In our situation, given the nature of distance learning, the characteristics of our learners, and the number and nature of the seminar participants, it was necessary to augment the instructional support for the course to provide the feedback and guidance that is critical to participant success. That augmented instructional support is present in the seminar in the presence of volunteers who moderate, co-ordinate and mentor the discussion groups. As we have mentioned these individuals come from a variety of perspective and backgrounds. One of our current challenges is providing the support and training necessary to ensure quality moderation and mentoring of the upcoming cohort of participants. We are in the process of establishing some concrete guidelines to facilitate this process. A few aspects of these guidelines follow.

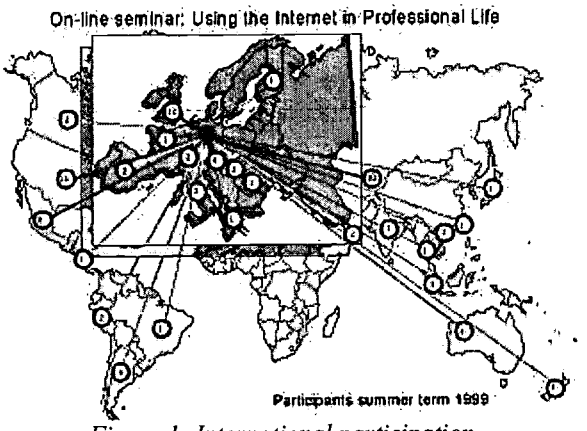

Figure 1: International participation

Facilitation of student learning needs to be a scaffolded process – especially given the obstacles of a virtual learning environment. In brief some of the obstacles that need to be considered and overcome by the moderation and mentoring process include: individuals may not be familiar or experienced with technology; learning in a virtual environment is very different from face to learning – there is the potential isolation of the student, the unfamiliarity of the electronic classroom, and the challenge of communication in an international environment in a text based medium. Our concerns for guidelines can be centred around the need to bring relative novices up to speed rather quickly – but our concerns focus on skills that will provide a quality experience for the participants.

Specific considerations for the moderators include how to scaffold this learning process in order to guide and enhance the quality of the discussion. Issues that we are currently dealing with include:

- How much moderation is called for
- Course organisation needs to define the roles and goals of moderation
- How to specifically scaffold the learning process
- How do we distribute the responsibility between moderators and learners

For example: if part of the learning objectives for the students to learn how to collaborate and engage in group collaboration part of the objectives for the course, then it is the moderators duty to explain and scaffold those activities through the course. Necessarily then the moderators participation and influence as the course progresses changes as the students become more self-sufficient.

Concluding remarks

We have investigated several aspects related to creating a socially constructed course design model. We have also reflected on, and asked if teachers and learners are flexible enough to adapt to these innovative forms of education. Active learning needs to be encouraged and facilitated through supportive design. This design needs to have structure and clearly demarcated support, the learner, especially within the current education system, cannot solely construct it. But there need to be guidance for teachers as well in order to get acquainted with and used to new methods and attitudes of learning.

The future of learning is still to be found by exploring the connection between organisation and collaboration. Organisation will be facilitated through carefully constructed collaboration. There are still questions to be answered. How are media selections for communications viewed and preferred by participants – and why? The research related to administrative functions is sparse. Collaboration needs to be organised on three levels: institutional, conceptual, and on an individual level. Investments of time, money, and effort need to be considered.

As we consider the Online Seminar, several things have become apparent to the team in the design, development and delivery of this course. Current work and research has been based on face-to-face instruction, we are only just beginning to compile information and experience for virtual learning environments. Adapting pedagogy from face to face instruction to virtual environments is first step in the emergence of a pedagogy that is rooted in VLE's. For example, research in computer-mediated discussion in quasi-synchronous environments has found that the learner assumptions and interpretations are very different in a VLE because their assumptions and interpretations are based on face-to-face interactions. Continued efforts and investigations will help refine the research process.

The courses within this collaborative learning environment demonstrate that there is no need to discuss whether there will be a future for teacher's profession competing with online courses. The concept of this environment foresees a very active role of the teacher as an organiser, mentor and/or moderator. But there are still strides to be made in the research on applying effective methods for teaching in collaborative learning environments.

What has the Online Seminar accomplished so far? It is believed that progress to date has produced a very good test bed for investigation of the following aspects: the organisational methods for this kind of activity, methods of training teachers in online teaching, and how to use available resources more effectively.

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