

Brief Paper

Addressed Topic: 3. New Roles of the Instructor & Learner - Improving Classroom Teaching

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Intelligent Online-Knowledge-Resources for Intentional Learning

Computer supported and instructional design of online knowledge resources

This paper presents a project that was designed to meet an instructional need rather than to exploit the capabilities of technology. We will present the instructional needs, a solution that exactly matched the requirements and an evaluation. The project is theory-based rather than technology-driven.

The Project

ifu - the International Women's University "Technology and Culture"- is the first and, so far, only gender-specific university project of its kind in Europe. ifu is an international university project; interdisciplinary in scope and methodology of academic work, and intercultural. Between 15 July and 15 October 2000 the International Women's University (ifu) offered 900 female students from all over the world the opportunity to participate in a postgraduate research and study program. ifu's first semester offered interdisciplinary academic work in six project areas: BODY, CITY, INFORMATION, MIGRATION, WATER, and WORK.

In a more long-range perspective, and supported by modern information technologies, the establishment of the modified "virtual" university served this purpose systematically and with various forms of institutional support. The virtual ifu (vifu) supported and extended the ifu on the internet. (<http://www.vifu.de>)

The Institute of Computer Engineering – Knowledge Based Systems (KBS), University of Hanover supported the project area WORK. We developed technical infrastructure, support and training. The Institute of Psychology and the Institute of Pedagogy made up the curriculum, provided content for this project area, and organized lectures. Lecturers from Western, Middle and Eastern Europe were invited. The idea was to facilitate this project area by a virtual part: the vifu. The KBS provided a special server: <http://www.work.uni-hannover.de> and constructed online-knowledge-resources. In order to evaluate the requirements and to face the needs we strongly collaborated with the Institute of Psychology and the Institute of Pedagogy. Such an interdisciplinary collaboration is very unusual to universities up to now. The social scientists had no specific idea on how the virtual part could enhance their teaching. We collaborated in figuring this out.

The Process

Guiding question

How can the virtual university part of ifu enhance the classroom teaching and learning during ifu?

Koshmann et al. (1) argue that computer supported projects should progress through several steps:

“(a) making explicit the instructional requirements that serve as design goals for the project”

First of all our interdisciplinary project group of sociologists, educationalists (providers of content) and computer scientists (providers of technical infrastructure, training and support) made explicit the instructional requirements. We faced the concept of the ifu which comprises five guiding principles:

The INTERDEPENDENCE and INTERACTION of science and society
INTERDISCIPLINARITY

The INTEGRATION of science and other social practices including the arts

The IMPLEMENTATION of women's studies and gender studies as well as

An INTERNATIONAL and INTERCULTURAL scope.

90 students from all over the world were going to study in the project area WORK: Postgraduated students from Nepal, India, Sudan, Germany, Australia, Brazil, Turkey, Austria, Kirgisistan, Ukraina, China, Tanzania, Estonia,

Latvia, Bangladesh, Russia, Hungary, Korea, UK, Sri Lanka, Sierra Leone, Argentina, Sweden, Burkina Faso etc. – students primarily not from western countries. Most of them researchers, lecturers, assistant professors at universities and NGOs in their home countries. Their fields of study were Business Administration, Women Studies, Human Resource Management e.g.. We did not want the students from Africa, America, and Asia to simply “learn from Europe”. Even if this was a huge number of students we did not only want to lecture them as they come with a strong cultural, educational, and also working background. But we still wanted to present lectures by experts in the domain of Sociology and Psychology. The social science is an ill-structured domain – there is nothing like a unique ontology. Neither did we want to present given systematics nor taxonomies out of context. Lectures wanted to afford an opportunity for fluent discussions on theories, on methodologies, on interdependence and interrelationships of factors e.g.. Information should be embedded in (cultural) context, by lecturers as well as by students.

The students should be enabled to realize interdisciplinary projects, to acquire knowledge presented by experts and practitioners, to share knowledge, to develop communities, to organize their own learning. Presenting knowledge as well as student’s project work was supposed to be supported by technical infrastructure, which facilitates networking and integration.

“(b) performing a detailed study of current educational practice with regard to these goals,”

There was no comparable project of international and intercultural scope to evaluate and to draw experience from.

“(c) developing a specification based on the identified requirements/limitations of the instructional setting and the known capabilities of the technology”

The project „Intelligent Online-Knowledge-Resources for Intentional Learning“ focussed on the following three aspects using concept maps to visualize context and topics:

- (1) The coordinator Margot Poppenhusen and the local dean Regina Becker-Schmidt of the project area WORK used concept maps to specify and structure the curriculum.
- (2) Online knowledge resources were organized in form of concept maps. Access was also provided in form of concept maps.
- (3) Lecturers visualized their talks in form of concept maps and presented them on the web. These concept maps guided lectures: they were shown during lectures on touch sensitive screens.

“(d) producing an implementation that allows for local adaptation to instructional practice”

Most of the lecturers had no experience using computers and Internet. Therefore we asked them to hand in drawings, notes and whatever they were working with and implemented the concept map visualization. This led to a set of concept maps, many of them having different characteristics and features based on the different needs and ideas of each lecturer. You may have a look at <http://www.work.uni-hannover.de> - *published talks*.

On the other hand we offered computer training for all of the students based on their prior knowledge. Some of them used concept maps afterwards to present their own work in the lecture hall as well as on the web.

Two main virtual projects were developed, prepared and provided:

- (1) The term ‚gender‘ and the concept of gender studies was presented against the background of division of labour and diverse cultural realities.
- (2) The effect of information technology and its impact on women’s work was presented against the background of basic shifts and fundamental transformation of work and work context.

Online resources for these projects were organized as concept maps. We helped lecturers, who often spent only little time in Germany, as well as students to organize resources this way. Step by step several projects became available on the web. Students had access to these resources in order to rework lectures and to use resources for their own project-work.

Evaluation

We evaluated the project along the instructional goals. Did the concept map approach face the needs of the participants? We had many interviews with students taped by a video camera.

As is seen in the evaluation, the concept maps actually changed the role of teachers and students. Teachers were facilitators, students brought up their own experience. Concept maps supported discussion on structure, terminology, and content. This was seen as relevant in teaching postgraduate students with strong intercultural, educational, and working background. It brought up very detailed discussions on interrelationship and interdependence of factors, and on diverse organization of society in different countries and cultures. It made explicit different situational realities and specific problems not experienced in Western countries. Making explicit structure and organization of knowledge enabled students to discuss, define, and mark the differences seen from different perspectives depending on culture. It even brought up discussions whether to structure things totally differently: students and lecturers shared different contexts and perspectives. During discussions they restructured subjects collaboratively.

In interviews we asked students

- (1) whether the concept maps helped to understand the talks
- (2) what they thought about the difference between concept maps and linear visualization of concepts in a lecture
- (3) whether the visualization supported discussion
- (4) whether they knew concept maps before
- (5) whether they had ideas to structure things differently
- (6) whether they would use concept maps in their own work and in their project to be presented

The following paragraphs include representative answers to the second and third question:

Linear texts do not stimulate participants to bring up their own experiences, to reflect their work experience within their context, within their working context and environment. If you present a concept map they can understand. A lecturer and trainer can also learn herself because it is not only a one-man show, you do not lecture but also you interact with the participants. I myself as a trainer accumulate experience through the exchange with my participants. If you give them the concept maps you can get new information which you don't have. A text instead is fixed. Sometimes I learn from my student more than they learn from me.

In my institute and in the whole of Sudan there is coming up the role of not trainers or lecturers but facilitators to facilitate the exchange between participants. And this is how you as a trainer learn from their experience. Because you learn from there experience in different parts of the country and environment. It's a facilitating business. We use role-plays, case studies, and exercises.

The context helps presenting the ideas. It is easy to see and to connect all the ideas with each other. It visualizes the dialectical relationship between any ideas. If subjects are presented one by one in a linear structure it is not easy to connect them.

Katalin Koncz presented her idea and we added some idea from our point of view. If I have a chance to present or to structure any subject I can also restructure the subject. Anyone has specific ideas about the subject and topics and a different approach to present and analyse the subject itself. It differs from one to one. And from background to background.

When concept maps are presented first you know what you are getting ahead of into. When it is just a linear text you must keep waiting what is next. But when you already know the relationship and when you already know the context it always becomes easier and the whole lecture becomes more interesting when you know what you are getting into. Another thing was: Sometimes I felt that in my mind there was a different context or a different relationship developing about the same map while the teacher was explaining it in a different way. Finally I arrived at a very different perspective, which I could share with the lecturer.

This is a great advantage because you have to see different dimensions and can share different perspectives on a certain thing. It is explaining so many things by just one map. Without having to say anything you explain so many things. Everyone has his own way of looking at it. Everyone has his own way of relating everything in a concept map. And usually there are different perspectives. The lectures which had concept maps and which started with concept maps were some of the most interesting lectures. We went back to them again and again.

It is a very interesting tool to make others to understand even if you want to go deep. I used concept maps within the methodology, which I used to address the gender issues. The concept map was very helpful to tell others about my methodology which I used in my field study. To explain what I do and how I do it. If other people (whether they like it or do not like it) would like to improve my methodology or want to put their own tradition on how to improve it. It is very fruitful in making people to understand. So there is a big scope for discussion in concept maps. It also helps you as a lecturer because you put in you own concept and understanding and when people start discussing it broadens your own understanding.

They do really support discussion. Definitely it sometimes goes into a wrong direction because you start concentrating more on the map rather than the idea behind it. But it does support discussion. It does support bringing out very very constructive arguments sometimes.

In these interviews students pointed out advantage over linear resources. Concept maps supported discussion. They changed the role of teacher and students inside the classroom.

We also asked students about a special software tool creating concept maps (Mind Manager), as we realized they wanted to create other kinds of structure than hierarchies. We did not intend to evaluate Mind Manager, but to ask whether hierarchical structures faced their needs. Some of the students told us: from their point of view, concepts in social contexts are structured not only in hierarchies, whereas computer supported databases often are. They were not able to realize dimensions, interdependence, dependency, transformation.

Not every topic and every idea has hierarchies like the ones Mind Manager represents. For example if you don't want to show branches but dimensions. It does not really fit into the concept a person has. A thing might have dimensions merging into each other and that is were I got stuck into Mind Manager. If you want to show that there is a common area but there are areas which are uncommon to two dimensions or two factors, that is were I had problems with Mind Manager. One thing is an intersection between two circles, which you can show through different concept maps but not through Mind Manager. Complex relations and interrelationship is another thing. I don't know how right I am, but I think, Mind Manager is something of the kind of thing that must tell about science and arts: sciences has clear answers of yes and no, but arts does not. So Mind Manager has been made by somebody who knows more of science. Mind Manager has clear answers. When you have clear answers you can really use this tool very well. But when you don't have very clear answers it becomes slightly difficult because you would be contradicting yourself by using this tool. Because you are showing something else and you are talking of something else. In most disciplines at high levels, especially the disciplines we have been studying here at ifu, everything is not black and white. There you might get stuck with Mind Manager. But if you have clear divisions then Mind Manager is a really good thing.

Almost all of the students attended the computer training in order to gain computer literacy. Some of them used concept maps to present their own project work.

We also intended the students to form groups and realize projects to be integrated into the online knowledge resources. However, students very often planned to finish research work which they started to work on before. Therefore they worked on their projects individually and just published them on the web. They did not really integrate them into online knowledge resources.

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