

Strand 2: Innovative Delivery: Methods and Approaches

Paper 12:

A Collaborative, Networked University: Organisational and pedagogical challenges

Harald Haugen

Harald Haugen, Stord/Haugesund
College, N-5400 Stord, Norway

Telephone/fax/e-mail: +47-53 49 13
76 / +47 53 49 14 01 /
Harald.Haugen@hsh.no

Bodil Ask, Agder Research Foundation
(SENTEK), N-4890 Grimstad, Norway

Telephone/fax/e-mail:
+47-37 25 31 31
+47 37 25 30 01
Bodil.Ask@hia.no

Abstract

- Information- and communication-technology (ICT) as a basis for open and distributed learning (ODL) is rapidly gaining importance as means of providing lifelong learning. Internet and WWW challenge higher education to re-think traditional, academic ways of organising universities and colleges, as well as requiring new pedagogical approaches to the provision of knowledge. Some institutions have found it worth while to join forces in a networked university, sharing responsibilities and supporting one another. Through different projects several links have been established for collaborative actions that are now taking place. This paper will present organisational and pedagogical arrangements that are necessary when four Norwegian institutions decided to establish a national, networked university - open also for other institutions to join in.

Among the organisational aspects, attention is drawn to institutional characteristics, commitment and objectives related to national and international goals and joint activities within education and research. Resources allocated for objectives like eco-

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nomical, technical, professional and pedagogical re-organisation, are specified in a partner contract - signed at the highest level of authority for each partner institution.

Concerning pedagogical aspects, discussions have focused on professional collaboration between university researchers and teaching staff for the development of ICT based learning environments. Different pedagogical models like traditional distance education, ICT supported, problem based learning, professional exchange and sharing of results and collaborative learning where students share responsibility for support and learning activities, have been tested.

Experiences with these models and combinations of them will be discussed in relation to the function of an ICT based, networked university - or a virtual learning institute (VLI).

Background

- Reports from the OECD, contacts with leaders of industry and public services show a lack of faith in the traditional, higher educational system to meet new challenges. This is, according to industrial leaders, the case for both initial, professional education and training, and to an even higher extent for in-service and continued education. They tend to look for other solutions and resource centres, outside the existing academic system, in order to develop and offer up-to-date courses and studies that fill their needs. New, private enterprises are more flexible to adjustments and tailor-made training programmes and packages, than are the large, public universities, which are bound by traditions and regulations.

National and international white papers and reports define the needs and sketch different models and solutions to the present situation and future requirements. The growing demand for life-long learning and increasing requests for new com-

petence can only be met by developing open and flexible learning programmes. Companies can not be expected to release their workers, technical and administrative staff for lengthy periods of time in order to upgrade their competence in specific areas or to raise their formal, professional level. Such education and training should be available at their desk, as a complementary activity in their daily routines. This requires flexibility and availability.

Typical for the situation in Norway is a very strict labour market, with an extreme lack of qualified personnel in several fields, and particularly in areas related to new information and communication technology (ICT). Politicians and governmental agencies do not see any immediate solution to the problem, and can only recommend import of skilled staff from abroad. In the long run, however, this is far from a desirable situation.

Experience from different ODL projects, both nationally and as part of international programmes (DELTA, Socrates etc.) has during the past 4 - 6 years created a basis for further development in the area of ODL. It is believed that this is a possibility of both offering industry and public services the learning facilities they are asking for, and for making higher education more attractive to potential students at all ages and stages of life.

Collaboration on the net

- To meet the national challenge 4 Norwegian institutions, that had previously (1992-94) participated in a European DELTA project, JITOL¹, started in 1994 to prepare for a joint, national offer of higher education, based on ICT and ODL. This project is known under the acronym NITOL², and has proved very successful with reference to popularity among students around the country. The diagram below illustrates the impressive growth of an activity that was mainly initiated for R&D purposes,

1. JITOL = Just In Time Open Learning, aimed at upgrading of professionals in different fields through electronic networks
2. NITOL = Norway-net with IT for Open Learning, where Norway-net refers to the national network of higher education

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and not for economic reasons or mass attendance. Marketing was close to nil at the start, and has continued at very low cost.

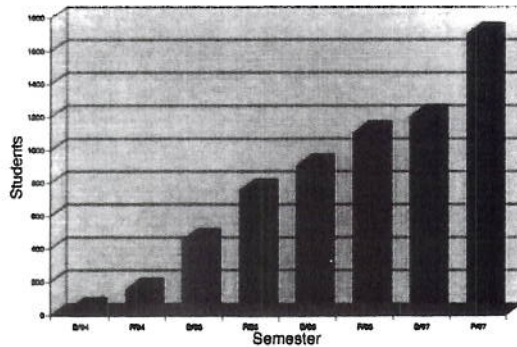


Fig 1. Students registered for NITOL courses

The rapidly growing number of learners attending the program clearly indicates a market and demand for courses and training. Since this is outside the regular, publicly funded university activities, students have to pay fees to cover the costs of delivery and tutoring. Nevertheless, lots of people see the advantages of availability of higher education when and where it suits them, so important that they will rather pay for it than attending regular study systems free of charge.

Observing these preferences in the population, the project group of NITOL has concluded that it is necessary to improve and extend the services of ICT-based ODL. The restriction of limited resources also makes it necessary to look for rational and efficient ways of providing these services. Collaboration between institutions with complementary competencies and specialities, exchange of products and knowledge, openness in research and development work, all seem to be possible strategies to obtain the set goals. The limited project initiated by a few persons within four geographically separated professional environments, would therefore have to be raised to an institutional level in order to expand further. This is the background for now embarking on an intentional agreement between the four institutions to establish a networked university (NU), or a virtual learning institute (VLI).

Organisational aspects

Institutions

- The 4 institutions involved are all part of the same national network, Norway-net. This expression was introduced through a governmental white paper in the late 80's, describing a professional network of higher educational institutions in Norway, in order to share responsibilities for the different academic fields and subjects. The 'net' did not necessarily imply electronic or digital connections, but did rather denote professional and human relations between academic societies in the country. Now, since the mid-90's, Internet and modern IT have gained such popularity that it is quite natural to include ICT as an important infrastructure to facilitate the Norway-net. This is also a natural link to previous experience from the JITOL project, where new ICT was a strong feature. (Haugen & Ask, 1996)

Characteristics and specialities of each of the four NITOL institutions are basically complementary,



Fig. 2 4 institutions in Norway-net

- a large university (20 000 students) with a wide spectre of subjects and professional study programmes, from undergraduate up to Ph.D. level, well known for their specialities within technology and science, represented in NITOL by their Department of computer technology and information science

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- two fairly big regional colleges (4-5000 students), both with strong departments of engineering and computer science, a wide spectrum of other professions and subject areas, and represented in NITOL respectively by their departments of telematics and computer science
- one smaller college (2000 students) with a more narrow spectrum of professions, a strong department of teacher education, and represented in NITOL by the division of educational information science

The strong representation of ICT personnel in the project was partly a heritage from JITOL, but also intentional to choose subjects and courses involving students and tutors that would not back away at first encounter with technical difficulties. When the project started in 1994, ICT was not as customised and user-friendly as it is now in 1998, and represented a major challenge in itself.

After taking the initiative for establishing the NU, the original four partners have invited other universities/colleges to join the organisation in the next phase. Rules for this expansion are discussed between leaders of the new organisation.

Objectives

The intentional agreement specifies three groups of objectives,

- international goals, including positioning our country in the global society of education, research and development, and contributing to international exchange and understanding as a basis for lifelong learning
- national goals, like improving access to education, filling gaps of knowledge in industry and society, raising the general level of competence, and developing new courses and lines of study that are asked for by industrial and political leaders and employees

institutional advancement in pedagogical and professional activities, renewing the study programmes, researching new ways of learning - and defining a common policy of academic and educational service development.

The objectives concern both research, development and creation of fruitful learning environments, stressing contacts with professionals from all walks of life, exchange of products and knowledge, and networked open learning offers to those who want, when and where they want it.

Economy and technical solutions

A common misunderstanding, particularly among politicians and administrators, is that networked open learning (NOL), - or 'distance education' - will be a less expensive way of providing education. Experiences so far indicates quite strongly that in order provide equivalent quality of learning, NOL, requires a lot of effort for initial development and maintenance of learning material, and that tutoring on the network takes more time than simply performing a lecture in a classroom or an auditorium. Students on the net -whether they are local, on campus, or at a distance - have a strong urge to ask for individual guidance e.g. through e-mail instead of running a discussion on a conference.

On the other hand, the total cost for society, including costs of transportation, student housing, costs of living etc., will be lower for NOL provided to the individuals at their home or workplace, compared to the cost if they would have to attend regular day-studies at a university. So the possible extra costs of providing higher education in the form of ODL, is more than compensated by the savings for the individual learners. In addition they are likely to have a better opportunity to meet other obligations in their lives, with respect to family, work and geographical location.

Technical solutions for providing ODL should be kept at a balanced level, not the most advanced and expensive, and not too old and out-dated for professional use. Both for NITOL and for the planned networked university, the intention is to apply the present standard of ICT at any time. In 1998 this means Internet connections through LAN or modems at no lower than 28,800 b/s, and PCs

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with possibilities of using standard WWW browsers and Windows-/Office software of at least 1997 standards.

etc. Where can we find funding for such activities? Should this be left to each institution, or shall NU take responsibility for R&D in its own field?

Formal organisation

The new NU will start as a joint project, based on a preliminary agreement between the four partner institutions. The intentional agreement suggests some lines of structure in the new organisation, and some ideas on how to share rights and responsibilities between the partners, a board and a secretarial function. Details are supposed to be settled in a partnership agreement, a signed contract at the highest level of authority at each institution.

The contract shall specify the organisational structure of the collaborative activity, how a board is appointed, what secretarial functions to have in common, what each institution has as its own responsibility, and how the net-organisation is meeting the outside world. After the organisation is formed, it is to be opened for other institutions with similar and complementary study programmes, e.g. other universities to join in or associate. Among the issues that will have to be specified in the contract, we find the following areas:

Managing of the project, i.e. with a representative board, a project leader, what power to delegate and what to keep at the hands of each institution

Practical administration, i.e. student registration, invoicing, accounting, general information, marketing, a course catalogue, updating of web-pages, applying for external funding

Economy; who is responsible at what level, what freedom and restrictions for the project leader, the secretariat, for the board etc.

Personnel; will there be a full-time leader? a secretary? tutors? designers? How to settle salaries and compensation for work and products? External funding and external workers?

R & D activities; a successful running of the NU requires continuous R & D activities related to the fields of ODL, technology, pedagogy, new methods

Pedagogical aspects

- A networked university depends upon inter-institutional collaboration on organisational issues, but it is also a challenge for collaboration between professionals on pedagogical issues.

Collaboration between professionals

Inter-institutional collaboration between professionals can be looked upon from different angles; from collaboration in distribution of learning material to collaboration in creating a total learning environment.

Collaboration in distribution of learning material is relatively easy to implement in a networked university. This might be as simple as just putting courses together in a common course pool, making a common catalogue of offers etc. If the teaching staff has access to colleagues' teaching materials and their way of dealing with pedagogical problems, they will have a well from which they can draw insight, experience and inspiration. On the other hand, it can be a bit tough for the person who 'owns' the material. Normally this way of collaboration is a win-win situation and brings synergy effects. (Ask & Haugen, 1996)

Another way of dealing with learning material is to join forces in development of course material. An example here can be when professionals from two or more institutions - even across borders - join forces in creating a course where no single person or environment has the necessary knowledge or resources to develop it. A NU can really profit from this way of sharing workloads. (Retalis, Skordalakis, Haugen, Ask 1997)

A third option is to develop single modules that can be bricks in several combinations of courses or studies within the collaboration. We can look upon single modules as building blocks to compose a course, or we can look upon different courses as fragments in a puzzle of a degree programme, inde-

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pendent of which institution the building blocks or fragments originates from. This kind of arrangements requires strong co-operation for recognition of credits and academic level.

The many different ways of collaboration between professionals seems to be a strength for a networked university, and is also a main idea and reason for establishing this kind of virtual institution.

Models of learning environment 'inside' a networked university.

It might be a contradiction in terms to talk about a learning environment inside an open, virtual organisation. Nevertheless, it is important to create a learning environment, especially when students are more or less 'off-campus' as most of the students attending the NU possibly will be. Normally we think that students attending a NU are adult people, people in a work situation, people looking for up-grading in their spare time etc. We also think about adult learners as mature persons taking responsibility for their own learning. Even if this is true, we as professional academic teachers, have a responsibility for making the learning environment for our students as rich as possible. The question is then : how can we create the best learning environment for net-learners?

If we look upon a NU as one institution, even though it is virtual, we also may think that the learning environment we create belongs to this institution and is a part of the pedagogical work going on inside the institution. We can of course differentiate between one learning environment for on-campus students, and a second one for off-campus students. But since a lot of teaching and learning activities apply the same tools and resources, it is both convenient and rational to include all students into the same learning environment. We may have difficulties if one student group has access to learning environments that are out of reach for the other group, whether it now be the classroom attendance or the network resources.

Normally a learning environment should be dynamic, adjustable to circumstances and content. It evolves and develops according to the environment and the persons involved. It is difficult

beforehand to tell how an environment is going to develop, but different models create different opportunities to the environment. We will look at a couple of models for a learning environment which have been practised within the NITOL networked university. (Haugen & Ask, 1996) The two models reflect activities where each institution acts independent of the others in the network. We will also look at the design of a more complete learning environment for a networked university, where the two models can be 'subcultures'.

The electronic, networked correspondence school

The main purpose for using this framework as a learning environment is to have a smooth and simple pattern for electronic delivery of learning material and for return of exercises from the students. The structure is well defined, with a fixed time schedule for distribution of materials and deadlines for return of exercises etc, presented in the start of the course. There are firm structure and leadership. This model gives little space for creative or spontaneous student activities or discussions of any sort.

If we add e-mail and electronic conferences to this model, it opens up for a learning environment that supports discussion groups, sharing of experience etc. It brings 'interactive' characteristics from the classroom into the virtual environment. Students are allowed to ask questions 'directly' to the teacher or tutor through e-mail. Responses will normally come either as soon as the tutor reads the mail, or at pre-defined times.

An example of this net-correspondence model using e-mail and conference facilities may be found at <http://www.idb.hist.no/fag/LO303D-GrunnkursEDB-NITOL/index.html>

Experiences from the use of this model as a learning environment have been amazingly positive. Amazingly because we thought that this way of using the network could be a bit boring for adult students and that they would not care about using these added facilities. On the contrary, it turns out, they like to stay in touch with the professional tutor - and with each other. The teachers' experiences from using this technique vary from one

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group of students to another. Even if you use the same framework, you are not able to tell how the environment will evolve. It takes time for students to develop effective use of e.g. conferences. Even tutors spend some time before they feel they are efficient.

The interactive learning environment model

In this model we use more of the services and facilities that the Internet offers. An example here can be the problem based learning (PBL) environment where students attending the same course are 'forced' to work together in order to bring forward interesting literature and articles on how to meet a defined problem, e.g. by using electronic hyperlinks to relevant material, which in turn becomes part of the study material or curriculum. This model has moved the learning situation from a classroom or group discussion and reference list to a workplace on the net where all the students' activities are visible for every other student in the group. In this environment students discuss, contribute in the learning process, submit their own thoughts and ideas of how to solve a problem, analyse each others' solutions and so on. The net is not only a 'transfer medium' for learning material, but it is also the place where the learning activities occur.

(<http://hugin.hsh.no/home/lv/mfag97/home2.htm>)

The networked learning environment

This model can contain the two previously mentioned models and all combinations of them, which more or less represent the specific way a tutor and the students create an environment for the actual course. When institutions establish an inter-institutional collaboration, a virtual university, it is important to agree on a common platform or learning environment for the students attending this university. One way is to establish a common home page for this virtual institution, where students get all the information they need e.g.: how to register, costs, equipment needed, exams, courses available, names of teachers, etc. Further more, it is important to make paths from this common arena to the specific course environments. If a specific course is developed by joint efforts from two or more institutions, it is natural that the actors

involved in the development also take part in running the course. At least they should have access to a common learning environment where all of them contribute together with the students. An example of a jointly developed environment model can be found at

<http://hugin.hsh.no/nitol/DoODL/classroom98/PiOL/>. And an example of the virtual institution learning environment you can find at <http://www.idb.hist.no/nitol>

Other models of learning environments

The European Socrates project MECPOL (Models of European Collaboration and Pedagogy in Open Learning) has surveyed and developed several models of interest in this area. They may be studied through the printed publications of the project outcomes (deliverables), or may simply be downloaded from the Internet, where they are listed on the MECPOL homepage, <http://www.idb.hist.no/mecpol/>. Of particular interest should be the Guidelines for networked open learning in a virtual learning institute (Product 3), and the shorter version of Guidelines to ODL - a Virtual Learning Institute (VLI).

More extensive training in this field is available as the on-line course in Pedagogy in Open Learning mentioned above

(<http://hugin.hsh.no/nitol/DoODL/classroom98/PiOL/>), and described in a paper, Learning by doing - an Internet course on methods for ICT based ODL (Ask & Haugen) at the BITE conference (Maastricht, March '98).

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MECPOL deliverables: <http://www.idb.hist.no/mecpol/>

Product 1: Models of collaboration

Product 2: Models of pedagogy in open learning

Product 3: Guidelines to networked open learning