Studies in the Context of the E-learning Initiative: Virtual Models for European Universities (lot 1)

December 2003

Final Report to the EU Commission, DG Education & Culture, Annex G
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1. Case profile for the Canege Consortium, France

This case profile comprises a presentation and analysis of the integration of ICT at the Canege Consortium in France. The case study is one of eight carried out as part of a strategic study on virtual models for universities. The eight best practice case studies have the purpose of enabling an in-depth understanding of the various models of ICT integration in universities, and also of the trends and perspectives they provide in relation to future scenarios. Additionally, the case studies are intended to publicise the experiences and lessons learned from those institutions or partnerships which are well advanced in their integration of ICT in university education.

The case profile is based on written material on the Canege Consortium and on interviews carried out during a site visit to the Canege Consortium in April 2003.

The focus of the case study is the Canege Consortium, primarily from the perspective of two of the participating universities, the University of Paris-Dauphine and University of Nancy 2.

The profile starts out by introducing the Canege Consortium and its background. Subsequently the profile focuses on the partnership model and the educational model. The overall strengths and weaknesses and the preconditions for success are presented next. Finally, the various sources used in compiling the profile are listed.

1.1. Presentation and background

The focus of the case study is the Canege Consortium (CAMPUS NUMERIQUE ECONOMIE GESTION). The Canege consortium is one element in a French national initiative launched in 2000, the Campus Numérique. Canege was formed in 2001 by six universities whose goal was to provide university-level distance education in the fields of economics, business studies and management. L’Université Paris-Dauphine (Paris-IX) is the lead partner. The other participants are:

- L’Université Pierre Mendès-France – Grenoble 2,
- L’Université de Nancy 2,
- L’Université de Nice Sophia-Antipolis,
- L’Université de Paris-Sud (Faculté Jean Monnet),
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• L’Institut d’Administration des Entreprises de Paris (Paris I – Panthéon-Sorbonne).

The Campus Numérique initiative is based on three calls for proposals in 2000, 2001 and 2002 to encourage the development of virtual campuses. Its purpose has been:
• to strengthen and support the use of ICT in teaching in order to develop French higher education.
• to make higher education distance learning and open education accessible to new target groups, in accordance with the concept of lifelong learning.
• to make French higher education more competitive in response to increased international competition.

The French Campus Numérique initiative focuses on offering virtual and online teaching programmes by encouraging the French universities to group themselves together into consortia. At the moment 64 consortia are supported by the Campus Numérique.

The goal: joint development of e-learning courses at three university levels

The objective of the Canege consortium is to develop and offer programmes in the fields of economics, business studies and management (économie et gestion) at three higher education levels: undergraduate (DEUG), graduate (MSG), and post-graduate (CAAE).

The six universities and the CNED (le Centre National d’Enseignement à Distance) are working together to develop and offer online programmes at the three higher education levels mentioned above. These will be pure e-learning courses targeted at students who are unable or unwilling to sign up for conventional campus-based university courses.

At undergraduate level, the Consortia offers the DEUG (Diplôme d’Études Universitaires Générales). The Universities of Paris Sud, Grenoble 2 and Nice are collaborating to develop the DEUG modules and programmes.
At graduate level, the Jean Monnet Institute at the University of Paris-Sud and the Universities of Paris-Dauphine and Nancy 2 are working together on the development of an MSG programme (Maîtrise de Sciences de Gestion).

Finally, at post-graduate level IAE Nancy, IAE Nice and IAE Paris are collaborating on the DESS programme (Diplôme d’Études Supérieures Spécialisées).

1.2. Co-operation, partnership and business model

**The consortium partners – development of the consortium**

Prior to the establishment of the Canege Consortium, the six universities had been working together on a number of issues in the field of distance education for several years. They also had some basic experience regarding the development of a common learning platform, but lacked the support needed to strengthen their co-operation. The launch by the French Ministry of Education of the national Campus Numérique initiative was a natural next step in strengthening and formalising their co-operation. In this way the national initiative can be seen as a driver for ICT integration.

The Canege Consortium represents the results of the hard work and commitment of a group of people in the six universities who worked hard to get the project on track. It is not the outcome of a strategic decision made by university management. On the contrary, it was the individuals involved in e-learning who persuaded their university managements that it could be an interesting project.

**CNED**

The seventh partner in the consortium is CNED (Centre National d’Enseignement à Distance), a governmental organisation established by the Ministry of Education. CNED offers more than 3000 online courses at all levels within the French education system, and offers online teaching for the French administration and companies.
CNED is currently involved in 19 Campus Numérique projects in a variety of roles, depending on the project. In many of them CNED hosts the learning platform and contributes to the development of the courses. CNED has extensive experience regarding e-learning courses and content.

The CNED’s role in the Canege Consortium is quite extensive and involves various elements.

- First and foremost, it is their function to host and maintain the learning platform and websites in close co-operation with administrators belonging to each partner university. CNED maintains and hosts several servers, something it is very experienced in. Technically, the students register in the CNED area of the platform and are then transferred to the university’s administration area, where they sign up for the course. The CNED’s role includes acting as a call centre which students can ring to get both general and specific information.
- Communication and information. CNED has produced information material and brochures.
- Supply of training. CNED is responsible for the training and tuition concerning the technical aspects and administration of the WebCT platform. In addition CNED acts as a knowledge centre which can provide consultancy on an ad hoc basis.
- Another important role of the CNED is to participate with the universities in the co-production of learning material. CNED contributes its experience from various other projects and consortia to the project.

Originally there was some discussion as to whether other partners such as CNED or private actors should be involved. The participating universities were worried that the CNED’s approach would be too traditional and insufficiently innovative since innovation was a specific ambition of the consortium, which was not interested in a replication of CNED’s earlier products. However, CNED was eager to be a part of the consortium and willing to adopt a new approach.

After some negotiations an agreement was reached, and CNED became a consortium partner.
**Videoscop**

Videoscop is not an independent partner in the project, but is one of the consortium’s subcontractors. It is attached to the University of Nancy 2 as an independent self-administered institution. Videoscop is involved in educational design, and produces audiovisual teaching material, multimedia and other products designed to extend e-learning and distance teaching. Videoscop employs 25 people, and its activities are commercially funded. Nancy 2 and other universities are its main clients. There are similar organisations attached to other universities, but Videoscop is the largest in France in terms of the number of projects.

Videoscop’s role is to participate in the production of the e-learning modules. It provides the technical and multimedia expertise and is responsible for the technical and operational aspects of the modules.

**International partners**

Other overseas universities are involved in the consortium, as:

- Université des Antilles Guyane (Guyana)
- HEC Liège (Belgium)
- Tunisian and Moroccan Universities.

These universities are not directly involved in the consortium but are co-operation partners associated with it on a looser basis. Their role is mainly to co-ordinate facilities for students wishing to follow Canege courses from their part of the world, providing tutors and making some adaptation of the on-line material.

**Private sector partners**

The Canege consortium has co-operated with two private sector partners.

**France Télécom**

In the early phases of the consortium France Télécom was involved as a subcontractor. CNED subcontracted the hosting and maintenance of the platform to France Télécom during the first months of the project. After this phase CNED terminated the contract and took on the maintenance function itself. When working with educational institutions, the challenge is to succeed in
bining technical expertise, educational expertise and skill in communication. It is the assessment of the interviewees that France Télécom did not succeed in adapting to the world of education. Their lack of experience in working with educational institutions and their lack of understanding of university logic outweighed the advantages of having a private partner. In addition, its service level and speed of response were not satisfactory.

**La Fondation Banques CIC pour le Livre**

The Fondation Banques CIC pour le Livre had an important role in the Caneg Consortium as a supplier of scholarships during the first two years. The scholarship covered 50% of the tuition cost for the maîtrise (MSG) and DESS (CAAE) programmes. It was awarded by a commission on the basis of social, geographic and academic criteria.

**Development of the e-learning courses**

The level of co-operation and the co-operation model used varies for each of the programmes offered.

For instance, when designing a CAAE programme the Caneg consortium appoints suitable professors from the participating universities to be in charge of it, and other academic staff to develop its content. The content is developed together with CNED personnel and adapted to the e-learning medium in which it is intended to be used. Videoscop or an unit at another university then undertakes the technical production of the programme modules.

In this way the programmes and the content of the modules are closely co-ordinated. However, the programmes are offered to the students by each participating university independently. This means that the students will, for instance, sign up for and follow a programme at the University of Paris-Dauphine. In this manner the universities are free to adjust and market the programmes as they wish. This is also made necessary by French legislation, which makes each university solely responsible for its programmes and degrees. It is not possible under French legislation to delegate the power to award degrees.
The business and management model

The Canege Consortium exists as a loose structure of six partners.

The management of the Consortia consists of three strands:

- **Board of Directors:** This consists of the vice-chancellors of each of the participating universities. They are responsible overall for the programmes and funding.

- **Steering Committee:** Three representatives from each participating institution meet every month. The Steering Committee manages the co-ordination of the Consortium and among other things is responsible for:
  - The finances and the funding of the programmes and sub-contracts
  - The contracts with academic and technical staff
  - Logistics
  - The development of the course content and the pedagogical approach

- **Scientific Committee:** The Scientific Committee’s responsibility is to validate the content of the programmes.

The University of Paris-Dauphine is the lead partner, and the project manager, Michel Armatte, is based here. As project manager he is responsible for the daily co-ordination, organising management meetings, handling the press and representing the project.

The participating universities appoint a member of the academic staff to be responsible for the development and content of each of the three programmes.

**Budget and funding**

The annual Canege Consortium budget is 1,750,000 Euro. The funding is sourced as follows:

- The French Ministry of Education: 350,000 Euro
- The participating universities: 400,000 Euro
- CNED: 650,000 Euro

The remainder comes from student tuition fees.

According to the interviewees the business model is quite loosely defined. The funds are distributed among the participating universi-
ties according to the number of modules to be developed.

**Relationship to Campus Numérique**

After three years, the national Campus Numérique initiative has come to an end.

During the project years no relationship was established with the overall programme framework, and there has been no co-ordination between the various projects supported by the initiative. The interviews indicate that several problems are general in nature and are also relevant to other consortia, such as legal issues and payment models. This points to the need for more co-ordination and central support concerning such matters.

**Assessment of the partnership model – strengths and weaknesses**

The consortium is still in an early phase of its implementation, and accordingly many issues are still emerging and needing to be dealt with for the first time. This calls for a lot of flexibility and co-ordination among the partners. According to the interviewees, it is a very important precondition for the consortium’s success that the individuals involved should know and trust each other. The long-standing relationships among the participating universities are a clear advantage in this respect. It is indeed a complicated process, and according to the project manager the co-ordination is by no means perfect. The start-up phase has been quite difficult, and everyone involved has had to understand and accept that it is inherently difficult to get a consortium of six autonomous universities running effectively.

The level of ICT integration among the various universities is quite different. Some are further ahead than others, but in practice this has not been a problem.

In general, the interviewees consider that the great strength and advantage to be found in the partnership is that they are developing both courses and content together. This is regarded as quite innovative, and the results have been good. They are learning from each other, which is valuable.

The weakness is that this process is very time-consuming and
demands a lot of resources. The co-operation model makes the system somewhat rigid, since all parties have to agree their actions and must also have their agreements approved by their internal systems. Of course, this is also due to the fact that the consortium's activities and processes are still very new.

Co-operation with CNED

CNED is the consortium’s main co-operating partner, and since the establishment of the consortium their relationship has grown.

According to the interviewees and the internal evaluation report, the experiences are mainly positive. It is a great advantage to work with a partner with the kind of capacity and experience which CNED has gained from other e-learning projects and consortia. However, it is considered that the parties can learn even more from each other in terms of content. The production of the course material and modules is the key challenge, and it is here that the co-operation with CNED has been problematic. Uncertainties about the modules’ legal framework have resulted in a huge delay in the CNED element of the funding, which has put a lot financial pressure on the universities. However difficult this was for the parties, those problems are now resolved and they are agreed that CNED should be even more heavily involved in producing the modules.

Co-operation with private partners

The partnerships with private companies have brought some problems. The co-operation with France Télécom was regarded as unsuccessful due to a lack of commitment and poor administration from its side. In addition, its lack of experience with university logic and educational issues turned out to be too great a disadvantage.

Co-operation with other actors

Canega has tried to work with other virtual universities and consortia, but this has proven to be very difficult. The main problems have been due to differences in approach and having to work with different learning platforms which communicate poorly with each other. In addition, the added value from synergies has been lim-
On basis of its mixed (and generally negative) experiences with private and other actors, Canege has decided to focus on internal development and consolidation. The consortium is still quite fragile and in an early phase of development, and it does not want to risk the possible destabilisation or loss of control over its processes by involving other partners at this stage. The assessment is that in a 3-5 year perspective there will be a need for further co-operation with other partners, including overseas partners. The working language is French, and therefore any overseas partners will come from French-speaking areas of the world.

**Strengths and weaknesses of the business model**

The Canege consortium finds itself torn between a public service and a market logic, and this is reflected in several of the problems they have experienced concerning their business model. The overall strength of the Canege business model is that the partners are working together on the development of the e-learning programmes. The development phase is extremely costly and resource-hungry, and it is not possible for a single university to take on such costs by itself.

The financial models have been revised several times because of the difficulties in assessing the course development costs.

In addition, the demand side has proven very difficult to estimate. The post-graduate and graduate level courses are aimed at professionals who can either pay for them themselves or whose companies will pay for them, but the size of this target market has been hard to gauge. The system records how many students have made preliminary registrations, but the fact that a large proportion of them do not return to complete the final registration is a problem.

The management of the consortium estimates that its market position is tough compared to private suppliers of post-graduate education, because its administration is much more top-heavy. However, they believe that the quality of the courses and their quasi-monopoly of academic degrees is a valuable starting point.
consortium’s future development.

The question for the consortium management of whether other sources of funding can be uncovered remains, including the possibility of private sponsorships.

Another difficulty with the business model has been the insufficient funding for multimedia and the interactive parts of some of the modules. This is mainly because no plan for these items had been developed at the central level. This problem has been aggravated by the delay in the CNED element of the funding, and also because of disagreements with the Ministry of Education about how the course writers should be rewarded. The problems with paying the writers have been troublesome for many teachers who have not been paid for the hours they have spent developing the courses. At this stage in the consortium’s development the partners believe there is a need to develop new ways of distributing funds among the various actors.

How is Canege integrated in the participating universities?

The consortium is still in an early phase, and it emphasizes that the outcomes so far should be assessed in that perspective. The establishment of the consortium and the development of the three programmes are very much the result of a bottom-up process driven by individuals in the universities interested in working with e-learning. The consortium is still a rather fragmented aspect of the universities’ activities, and there are no structures to ensure co-operation or knowledge sharing between the teachers involved in e-learning and the rest of the academic staff. As a consequence, the spill-over effects on the general integration of ICT in teaching are still very limited. Participation in Canege is part of the universities’ ICT strategies, but the approach is more ad hoc than representing an element in a comprehensive, holistic approach to ICT integration and e-learning. However, the interviewees believe that Canege will act as a driver for the general ICT-based development of both courses and content.
1.3. The educational setting

The learning model

The focus of Canege is to develop independent learning programmes as a supplement to the regular course programmes of the participating universities.

The platform for the courses is WebCT. Students access their course through a site d’accueil after entering their password.

The learning model’s overall approach is to make available all the resources (including teachers) which are necessary for students to be able to work independently via the internet. Each course or module comprises a number of lessons which the students can access at their own pace.

Each course is composed of the following three key aspects:

- online tutoring with questions, discussions, exercises
- interactive content: links to curricula, quiz and evaluations
- access to databases.

The course developers have tried to include videoconferencing in order to develop the methodologies further and reinforce the interactive approach. An important consideration in this respect is that the stu-
Students must supply their own hardware and software. Therefore the developers cannot include elements that require multimedia or other kinds of high-speed technology or hardware.

The Canege administration is generally encouraging the teachers to track their students on the Internet in order to keep an eye on how they are progressing, when they are accessing the system, and what parts of it they are using. One of the key challenges is to make sure that the students stay focused and committed and do not drop out, and that is difficult when there is no face-to-face contact. There is some discussion among the teachers about how much responsibility they should be taking for this. Some of them argue that the students are responsible for their own learning, but most teachers do agree that they should try to monitor and support the students.

As previously mentioned, the participating universities are free to market and deliver their courses as they wish. At Paris-Dauphine the professors begin with one physical classroom session to kick off the course and one or two physical classroom sessions during the course. This is seen as necessary in order to commit the students and establish contact among students and teachers. This is not part of the Nancy 2 model.

The students come to the physical campus for their exams. However, it is possible to take an exam from abroad, for instance at an embassy, but this aspect needs to be developed further.

Target group of the Canege programs

The e-learning programmes are mainly targeted at students who for some reason require a university education which is more flexible than the traditional format. This applies, for instance, to people who do not want to spend time travelling to the campus, or professionals who are at work during the day.

Teachers involved

One of the key challenges for the management of the Canege consortium is to mobilise and motivate the professors to become involved in the project. This is particularly important because the course content and development, and hence the quality of the programmes, depends on the professors.
The teachers interviewed said that they had decided to participate in the project out of professional curiosity and an interest in new ways of learning. The teachers are recruited purely on a voluntary basis. This is important, because distance teaching and e-learning are still in an experimental phase and the teachers need to be motivated and committed in order for it to succeed. The consortium and the e-learning courses has recently become an integrated element of the university strategies. In addition, e-learning is not very prestigious and there are no specific incentives available for motivating the teachers to join. As a consequence it has proven quite hard to recruit and retain teachers for the programme. The project management and the teachers involved are trying to overcome this by promoting the project to other parts of the universities. However, there are no formal co-operation structures between the project and the rest of the teaching staff at either Paris-Dauphine or Nancy.

In addition, the universities are experiencing some disagreements concerning the teacher payment model. The universities are presently trying to work out how to make the different modes of teaching e-learning courses correspond to the regular payment model. Some universities are resisting paying teachers by the hour for non face-to-face courses.

**Development of ICT competences**

The teachers are not offered any specific ICT courses, but they are introduced to the platform and given the opportunity to attend a seminar on e-learning pedagogy.

Experience has shown that the teachers are generally having no problems so far in operating the e-learning platform. The challenge is not so much the technology as adopting a different pedagogical approach for teaching on-line.

**Quality assurance**

According to the interviewees, quality assurance of the e-learning courses is crucial for maintaining the high standard of university degrees and achieving formal recognition of the courses among both students, academics and the labour market. The participating universities all emphasize that they are working hard to ensure the quality of the programme. Accordingly, the Scientific Committee is validating
the content. In addition, it carries out student evaluations in order to be able to keep developing the courses.

Some of the interviewees emphasized that the concerns about the recognition of e-learning courses has, in their opinion, led to these courses achieving a quality which is superior to the ordinary courses.

Strengths and weaknesses concerning the educational setting

Maintaining the overall high quality of the courses is seen to be one of the key challenges for the consortium.

First of all, it should be emphasised that e-learning does not suit all groups of students. According to the teachers, it is most suitable for graduate and post-graduate students and needs to be adapted carefully to the specific target group.

Taking this into consideration, it is the opinion of several of the teachers that e-learning possesses several qualitative advantages. Tutoring in e-learning classes is generally more personal than education delivered in large classrooms on big campuses. In addition, the tutors can adapt their tutoring to the students’ specific needs.

The existence of the six-university consortium means that all Caneg students obtain access to a database which includes subscriptions to periodicals, articles and other material from all six universities. This is regarded as being a great advantage to the students.

The full impact of the on-line tuition is felt when it is combined with elements of face-to-face interaction. This should preferably occur in the beginning in order to establish contact and commitment among the participants, and also once or twice during the course itself.

However, getting accustomed to e-learning in order to make the most of its educational possibilities is a developmental process for students, teachers and management alike. At present the students are not used to this mode of studying and are not as active as had been anticipated. In general the students are still used to the teacher being in control of the learning situation, and not very accustomed to taking responsibility for their own learning. This will of course change for fu-
ture generations who will be brought up in a different school tradition, but until then this change should be supported. In addition, both students and teachers are using the e-learning facilities differently than anticipated. For instance, for some reason the teachers are reluctant to conduct online discussions.

Caneg is now evaluating how the learning structure and course design are supporting the learning which is taking place. In this stage of the consortium the partners see the need to apply extended checking procedures to the servers and content. As part of this exercise they carried out a survey among the students. The results of the survey indicated the following problems:
- The start-up phase is too slow. Better information delivery to the students and faster start-up times are necessary.
- The sign-up phase is too complicated and not transparent enough.
- The back-up available to the students should be stronger, and there is a need to monitor when students are dropping out and why. One of the reasons for dropping-out is the amount of work to be done and the lack of co-ordination between modules.

1.4. Outcomes and lessons learned

Strengths of the Caneg model

To sum up, the Caneg consortium and the close co-operation between the participating universities and the CNED in the development of the modules has proven to be both a strength and a source of distress. Joint development of content makes for a better product and initiates some interesting processes and results. But it is very time-consuming and difficult to co-ordinate.

In addition, the case study points to the following strengths in the Caneg model:
- Great expertise of the partners within the field of distance education and the development of content.
- Close ties between the six participating universities. The partners are used to working together.
• A fairly loose partnership structure to begin with. The process has shown a need for strengthening the management and the implementation structure, but flexibility during the start-up phase was seen as necessary.

• Economies of scale. The development of e-learning courses and material is extremely costly, and entering into partnerships has given the participating the opportunity of offering them.

• The partnership model whereby the universities work together in the development of content has resulted in the production of high-quality e-learning course material.

Key challenges for the Canege consortium

The key challenges for the consortium are:

• To anchor the work of the consortium and integrate it in the university. In order for the consortium to have an impact on those parts of the universities which are not involved in it, the work of the consortium needs to be integrated into an overall strategy for the universities. An important aspect of this is to ensure the support of the management in order to enhance the status of e-learning and make it more attractive for the teachers to teach e-learning courses.

• Changing attitudes. Many individuals among both teachers and management are still very sceptical towards e-learning and technology-based learning.

• Resolving the issue of how professors and teachers should be paid for the development of content.

• Resolving the issue of intellectual property rights and copyright pertaining to e-learning material.

• To develop a faster and more flexible model for funding and administration.

• To develop pedagogy and content targeted specifically at the different groups of students and strengthening the relationship between teachers and students.
Preconditions for success?

It follows from the case study that the main preconditions for the success of projects like the Canegé consortia are:

- The partners must know each other very well and stick to their commitments. They must also be willing to engage in a time-consuming process.
- They must be able to motivate the professors, since they are the key to developing the courses, and to supply them with clear information on their rights and duties concerning tutoring.
- The platform must be robust and operate continuously.
- The partners must be clear on what methodologies and pedagogies they are going to use and how the technology is going to support them.
- The students have to understand that they themselves will decide the success of the courses, and that they have to take responsibility for their own learning.
- The courses must be targeted specifically at different groups. There are huge differences in how the courses should be constructed, depending on the level at which the students are studying. Post-graduate MBA students, for instance, are much more active and are accustomed to taking responsibility for their own learning. Graduate or undergraduate students need more attention and support in order to get the most out of the e-learning courses.

Trends and scenarios

As mentioned previously, the consortium is presently focusing on the consolidation and internal development of the partnership and courses. In the future it plans to include more partners in the consortium, perhaps on a looser basis. Some of these partners may very well be located overseas, primarily in the French-speaking areas of the world. There are also plans to translate the courses and export them to east European Countries.

Areas in need for further development?

- There is a need for research into e-learning pedagogies. Existing research is limited, and there is a lack of knowledge about the risks and consequences of various approaches to e-learning.
• Improvement of the information systems, the systems for sharing experience and the mechanisms for disseminating good practice and other material.

1.5. Sources and links

**Interviewees**
The focus of the case study was the CANEGE consortium. The university of Paris-Dauphine (the lead partner), the University of Nancy 2 and Videoscop were visited. During these visits the following individuals were interviewed:

- Michel ARMATTE, project manager, Paris-Dauphine University
- Jean-Luc FAURE, CNED
- Mylène PETRYNKA, CNED
- J. F. LEMETTRE, responsible for CANEGE at University of Paris 11
- Yann BOIVIN, in charge of technology, Paris-Dauphine
- Henry ISAAC, teacher and former student, Paris-Dauphine University
- Bernard DE MONTMORILLON, vice-chancellor of University of Paris-Dauphine
- Christophe MARAND, Videoscop, Nancy 2
- Gérard CASANOVA, Head of distance teaching, Nancy 2
- CANEGE student, Nancy 2
- Olivier TAUTEAUX, CANEGE student, Paris-Dauphine
- Anne-Marie CHARLES, teacher, CANEGE, Paris-Dauphine
- Mr. BOURBONNAIS, teacher, CANEGE, Paris-Dauphine
- Mrs COLLETTE, teacher, CANEGE, Paris-Dauphine
- 3 teachers from Paris 9 and Paris 11.
- 2 professors, Nancy 2

**Contact information**

**CANEGE:**

Project manager: Michel Armatte
mailto:michel.armatte@dauphine.fr

+33 (0)1 44 05 40 16
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**Consortium website**

Campus Numérique:
http://www.formasup.education.fr/fichier_statique/campus/

Canège:
http://www.caneg.org/

**Partner websites**

For more detailed information on the different national universities involved see:
http://www.educnet.education.fr/superieur/campus.htm

CNED:
http://www.CNED.fr

**Report and other documentation**

- “Campus Numérique – enjeux et perspectives pour la formation ouverte et à distance”, Rapport de mission sous la direction de Michel Averous et Gilbert Touzot, 2002
- Videoscop, “Conseil d’administration”, décembre 2002
2. Case profile for the Finnish Virtual University, Finland

This case profile comprises the presentation and analysis of the integration of ICT at the Finnish Virtual University (FVU). The case study is one of eight which have been carried out as part of a strategic study of virtual models for universities. The eight best practice case studies have the purpose of enabling an in-depth understanding of the various models of ICT integration in universities, and also of the trends and perspectives they provide in relation to future scenarios.

The case profile is based on published material about the Finnish Virtual University and interviews conducted during a site visit in June 2003.

The profile starts out by introducing the virtual university and its background. A description of the organisational model of the university and its business model follows. Then the co-operation model is presented, as well as an account of how and why the university co-operates with private partners. After this the use of ICT in an educational setting is described. The case profile ends with an overview of the outcomes and lessons which can be drawn from the case of the Finnish Virtual University.
2.1. Presentation and background

The Finnish Virtual University (www.virtualuniversity.fi) is an organization founded by the 20 universities plus the National Defence College in Finland for the purpose of carrying out their virtual university activities. These encompass the use of ICT in education, administration, student counselling and the organizing of support services for research.

The Finnish Virtual University does not provide academic education independently, nor does it have the authority to award degrees. Together with its member universities the Finnish Virtual University:

1. Develops high-quality network-based education and study services
2. Co-ordinates online education provision, student counselling and research network activities
3. Develops records and databases of curricula, student information and study registers
4. Produces publications
5. Drafts the agreements needed to facilitate the activities
6. Establishes the necessary operational bodies
7. Collects fees in order to finance its activities.

In addition to this there are a number of co-operative networks for the educational and research use of ICT in the Finnish universities under the
In 1999 the Ministry of Education published its National Strategy for Education, Training and Research in the Information Society for 2000-2004 (http://www.minedu.fi/julkaisut/information/englishU/index.html). One of its goals was the founding of the FVU, and thereby the creation of a nationwide network to ensure more flexible study opportunities and to strengthen networking in research.

The strategy states, "By the year 2004 a high-quality, ethically and economically sustainable network based model of organising teaching and research will have been consolidated".

The Ministry of Education’s implementation plan from the Information Strategy for Education and Research 2000-2004 (http://www.minedu.fi/minedu/education/inform_strategy_implementation_plan.pdf) additionally states: "By 2004 a virtual university based on a consortium of several universities, business enterprises and research institutes will be set up. It will produce and offer internationally competitive, high-standard educational services."

The founding meeting of the FVU was held on 18 January 2001. The Finnish Virtual University was created through the co-operation of all Finnish universities and the Ministry of Education. It is developed and run by a development unit.

According to the approved 2001-2004 Finnish Virtual University operating plan, online access to services and new, network-based activities in university education, research and administration were to be developed in two main stages:

Auctioners of the Finnish Virtual University. Some of these have been established as development projects, while others are older networks subsequently integrated into the FVU’s activities. Networks are either regional, specific to academic disciplines, or service networks through which several universities share online and support services. In addition to this, a network linking Finnish university libraries has been established.
1. The pilot stage of actual activities during 2001-2003, which include:

- clarifying the desired end-state, forms of co-operation and the consortium’s focal areas
- developing and testing new procedures
- improving university teachers’ skills in information and communication technology
- organizing educational technology support to meet the requirements of online learning
- supporting universities in drawing up and implementing their information strategies
- establishing a nationwide portal
- supporting and co-ordinating the supply of online education
- offering information and support services to university students and staff
- enhancing the exchange of information and resources among universities
- determining the permanent organizational form of the virtual university
- evaluating the results of all development projects in order to identify best practices, establish systems for quality assurance, and define the services which will be maintained through university budget funding.

2. Consolidation and expansion stage, 2004 –

On the basis of the research results, service activities and pilot online teaching projects, regular university services will be developed and established. This will be done mainly during the agreement period on target outcomes beginning in 2003, the first year of which is still covered by the information strategy for education and research. By the end of 2004, the Finnish Virtual University aims to have established the structural conditions in Finnish universities for an extensive and internationally-oriented virtual university system.
Strategy of the Finnish Virtual University

According to the 2003 strategy of the Finnish Virtual University (http://www.virtuaaliyliopisto.fi/arkisto/FVU-strategy.pdf), the FVU’s general strategic objectives are to "help its members to improve their capacity to manage their current and future activities with the help of network co-operation and ICT, taking into account the ongoing changes in the university sector and the new challenges brought on by the Bologna process. The objective is to provide support services and research that:

- capitalize on the strength of each university
- enable universities to concentrate better than currently on their core tasks
- promote co-operation and division of labour among universities
- strengthen the international position of the Finnish university system
- improve its attractiveness and competitiveness among students, teachers and stakeholders and save university resources in the long term"

Status of the initiative

Under the auspices of the Finnish Virtual University a number of networks have come into existence, including regional initiatives, joint initiatives supporting online education, and subject-specific initiatives. All Finnish universities participate in different ways in projects related to the Finnish Virtual University and have been granted general funding from the Ministry of Education to enhance their use of ICT.

Regional initiatives

Regional networks are co-operative projects among different universities which exist to develop virtual university activities.

Examples of regional networks are:

- Helsinki Business Campus (Helsinki School of Economics, Swedish School of Economics and Business Administration)
- Eastern Finland Virtual University Network (University of Joensuu, University of Kuopio and Lappeenranta University of Technology)
- Learning Centre (University of Vaasa, Swedish School of Economics and Business Administration and the Ostrobothnia Unit of Åbo Akademi University).
Representatives from the Learning Centre project (http://learningcentre.tritonia.fi/) were interviewed for the case study. The project is developing new methods for teaching and studying, both in network-based teaching as well as in more traditional teaching. There are three local university units working together in the Learning Centre project, namely the University of Vaasa, the Swedish School of Economics and Business Administration, and the Ostrobothnia Unit of Åbo Akademi University.

The aim of the project is to motivate the teachers and students in these universities to take advantage of the opportunities made available via ICT in their teaching and studying.

Additionally, representatives from the Helsinki Business Campus were interviewed concerning their experiences with the development of teacher competences.

**Joint initiatives supporting online education:**
Examples of these kinds are networks are:
*IQ Form* – developing a supporting learning environment for the Finnish Virtual University (co-ordinated by the University of Helsinki)
*IT-Peda* – Network for Enhancing Knowledge Concerning Online Teaching and Learning in Finnish Universities (co-ordinated by the University of Tampere)

The IQ Form project (http://www.edu.helsinki.fi/iqform) was visited during the case study.

The Department of Education and the Department of Computer Science of the University of Helsinki started the IQ FORM project in order to develop a learning evaluation and support system. The IQ FORM system is an interactive feedback system and can be used by all Finnish universities. As such it comprises one of the joint services of the Finnish Virtual University.

The IQ FORM supplies information about the qualities of students as learners e.g. learning profiles and motivational structures as well as ‘social navigation’ during their virtual studies.
The system is based on different theories, as shown in the figure:

The system consists of a large data bank containing different kinds of instruments for mapping the needs of learning and learners on the web. The instruments are used to evaluate learning profiles, styles, motivation, strategies, skills and self-discipline. With the help of the system quantitative and qualitative feedback can be collected and analysed.

The system is suitable for tutoring when studying on the Internet; it functions as a support for the student during his/her studies and gives feedback to teachers, designers and Web material producers even as the coursework progresses. Guidance given by the IQ FORM motivates the student to develop his/her strengths and learning strategies on the basis of self-assessment tests. The system is also designed to support collaborative virtual learning.

The system can help to identify which contents and assignments suit the student best. Guidance actions can also be directed better with the assistance of the system. It also gives feedback about the functionality of the virtual learning environment.

The partners in the project are the University of Oulu, the University of Tampere and the University of Joensuu.
One of the strengths of IQ Form is that the system was developed by academics from several different disciplines, involving contributions from the fields of educational science, psychology and computer science.

According to project manager Hannele Niemi of Helsinki University, an additional strength of the system has been its focus on the students' time management skills- a very important aspect of virtual learning environments. The system can therefore be an effective tool in reducing drop-out rates.

2.2. Organisation, management and business model

The organisational structure

The Finnish Virtual University Development Unit – a unit comprising 10 employees – co-ordinates the daily work of the Finnish Virtual University. The unit maintains and develops the portal and is responsible for providing its services. The development unit reports to the steering committee and the consortium of all the Finnish Universities.

The Consortium Assembly is the Finnish Virtual University's decision-making body, with one representative from each member university plus one from the Ministry of Education.

The agendas for the Consortium Assembly's meetings are drawn up by the Steering Group, which also exercises authority between meetings. The Steering Group consists of five members nominated by the Consortium Assembly and one by the Ministry of Education, as well as the director of the Finnish Virtual University Development Unit. Additional expert members include a representative of the partner CSC, a representative of the National Union of Students in Finland, and the staff of the FVU Development Unit.

Funding

The Ministry of Education funds the FVU project with about 9 MEUR a year. The European Social Fund is providing 1.5 MEUR for the FVU portal for the years 2001-2004. Half of the money from the Ministry is spent on the general funding of universities, and the other half is expended on individual project funding.
According to the Ministry of Education, private sponsorships exist almost exclusively in connection with research projects.

**Business model**

The current business model of the Finnish Virtual University is dependent on the availability of funding from the Ministry of Education and the European Fund. The Ministry is responsible for selecting and granting funding for universities and the network projects on an annual basis.

**Lessons learned: future model of the Finnish Virtual University**

The Finnish Virtual University will be evaluated in 2004. The Ministry of Education will consider possible future models for the FVU on the basis of this evaluation. The FVU is guaranteed funding till the end of 2006. Future business models could either involve continued government funding or a more company-like structure in which the universities involved own the FVU.

According to the chairman of the steering committee of the Finnish Virtual University, Professor Matti Jakobsson, there are two possible scenarios for the future:

1. A corporate format which establishes the Finnish Virtual University as a legal entity. The universities will be the shareholders of the company.
2. A loose network. The Finnish Virtual University could for instance be a vehicle for joint action in producing courses, establishing international contacts and partners, and creating educational services for teachers.

The Finnish Virtual University's main future priorities will be the maturation of technologies, metadata standardization, single sign-on, quality assurance, and the increased availability of support to teachers and students.
2.3. Co-operation and partnerships

Co-operation
one of the
main aim of
the project

Co-operation among the universities is a key element in the structure of the Finnish Virtual University. According to the Finnish Virtual University and the interviewees networking brings very positive experiences, but it does take time to make this kind of co-operation work.

Co-operation
at international level

The Finnish Virtual University initiative is internationally well-known, but is not heavily engaged in international e-learning co-operation with other universities. While it is following international developments in this area, according to the chairman of the Steering Committee, Professor Matti Jakobsson it does not believe in a European Virtual University.

However, the Finnish Virtual University is involved in the MENU project (Model for a European Networked University for e-learning) funded by the European Commission. The major goal for the MENU project is to create a model for a European Networked (Virtual) University, offering a variety of e-learning possibilities. 11 partners in 7 European countries are joining forces to establish the model. The model will produce an organisational structure, a quality assurance system, examples of joint courses, and study programmes across institutional and national borders.

Projects with virtual mobility

A milestone agreement was concluded in Spring 2003, when all universities signed an agreement on virtual mobility affecting the students of all Finnish universities. The agreement is about mobility in general (both physical and virtual). The need for a national agreement came from the virtual environment but it was soon understood that there is actually no difference from contractual points of view what ever form of mobility is used. The agreement also covers the financial aspects. More detailed work will still need to be done in order to actually implement the agreement.

Co-operation
with private partners

According to the FVU there are some examples of public-private partnerships in the Helsinki and Vasaa regions. A concrete example of public-private partnerships is the Connet project in which students and professors are co-operating with private companies like the de-
sign company RATIA, in this instance in order to improve product design.

The development unit of the Finnish Virtual University very much co-operates with:

- CSC (the Finnish IT centre for Science, owned by the Ministry of Education). CSC provides modelling, computing, and information services for universities, research institutions and industrial companies (http://www.csc.fi/suomi/info/index.phtml.en)
- YLE is Finland's national public service broadcasting company. YLE operates five national television channels and thirteen radio stations and services. (http://www.yle.fi/)

**Assessment of extended EU and national cooperation**

According to the FVU's Development Unit, a strong body is needed at European level which is capable of setting standards in order to facilitate virtual mobility.

According to the Finnish Virtual University Development Unit, more framework programmes are required for further European co-operation.

### 2.4. The educational setting

**The educational setting is changing**

The educational setting of Finnish Universities has changed during recent years due to the integration of ICT and the emergence of the Finnish Virtual University. A reason for this is that all the universities have developed ICT strategies, which was a requirement in the early days of the Finnish Virtual University. These ICT strategies and the projects carried out under the Finnish Virtual University have, according to several interviewees, led to changes in the educational setting.

At Helsinki University, which was visited during the case study, ICT strategies are also being developed at faculty level. In each department there is both technological and pedagogical support for teachers. There is access to virtual portfolios and other services for
students. In postgraduate education, all courses include some virtual elements in their blended solutions.

**Development of ICT competences**

The development of ICT competences among the teachers has been a prime priority for the Finnish universities, as well as for several Finnish Virtual University projects.

One regional project for teacher support – the Helsinki Business Campus ([http://www.helsinkibusinesscampus.fi/entrance/](http://www.helsinkibusinesscampus.fi/entrance/)) – has been set up jointly between the Helsinki School of Economics and the Swedish School of Economics and Business Administration. The two institutions are situated close to one another in Helsinki. Their project focuses on the development of teachers' competences. The practical outcomes of the project have been:

- A media lab – an open place to work, learn and test
- An advisor – a support person for teachers, located on campus
- Workshops and courses for teachers on campus
- Co-operation of support personnel on campus

Both institutions are technologically well equipped, and ICT is integrated into the daily teaching of many teachers. The purpose of the project has been to develop their competences even further. Still, it is difficult to integrate ICT. As one of the teachers said during the interviews, "This is something that only crazy teachers would do".

The Learning Centre regional project’s focus ([http://learningcentre.tritonia.fi/](http://learningcentre.tritonia.fi/)) is also on the development of competences among teachers.

The Learning Centre’s eduCLINIC supports teachers and personnel in taking advantage of information and communication technology for teaching purposes. EduCLINIC helps e.g. in designing net-based courses or learning about the creation of study media (CD, DVD). It is also possible simply to come along and try out the new technology.
The Learning Centre also supports students in absorbing studying innovations. A virtual study adviser is based in the Learning Centre for this purpose.

The virtual study adviser answers questions about studying, e.g., What is the Virtual University? How can I study virtually? What kinds of courses are available via the net? Can I integrate my virtual courses into my degree?

**Changes in the role of the teachers**

The teachers of the Helsinki School of Economics and Swedish School of Economics and Business Administration consider that their teaching role is changing through the use of ICT for both campus-based training and e-learning. They state that they have to "create the atmosphere" much more in e-learning activities.

**Changes in the role of the students**

According to teachers of Helsinki School of Economics and Swedish School of Economics and Business Administration, the students have really been a driver for change by exerting a constant pressure for ICT integration and online services. It is also their experience that the students have become much more active through using ICT.

### 2.5. Outcomes and lessons learned

**Strengths of the initiative**

The main experience of the Finnish Virtual University has been that constructing a networking-based virtual university like the FVU takes time. In fact, the Finnish experience demonstrates that the goal of establishing such a network among all universities takes years to achieve. In the opinion of the interviewees, the strategy of focusing heavily on the sustainability of the network has proven to be correct.

The teachers of Helsinki School of Economics and Swedish School of Economics and Business Administration, who thought that the establishment of networking was the main success of the Finnish Virtual University, underlined this virtue. This ‘win by sharing’ strategy has been the main outcome of the Finnish Virtual University.
Professor Pertti Saariluoma of the University of Jyväskylä stated that real networks have been created via the Finnish Virtual University, and that the Finnish Virtual University’s physical meetings have been a real asset.

The Finnish Virtual University is working on a recently approved strategy which sets clear goals for the coming years. The approval of the strategy by all the universities makes it a powerful tool.

Another strength of the Finnish Virtual University is the quantity of services developed and accessible through the portal.

**Weaknesses of the university**

The uncertainty concerning the future model of the Finnish Virtual University might be a possible obstacle for the further development of the Finnish Virtual University over the next few years.

According to Markku Markkula, the director of the HUT Dipoli, and a one-man committee on e-learning in Finland, one of the strengths of the Finnish Virtual University has been the competences of the development unit. On the other hand, the unit has had to deal with too many practical problems. There is a definite need to free up resources in order to be able to think about future developments in an innovative way. According to Markku Markkula, there should be even greater focus on multidisciplinary networks.

According to Professor Pertti Saariluoma of the University of Jyväskylä, it is very important that the Finnish Virtual University should continue for at least another five years; ten years at least are required for worthwhile results to be achieved. Thinking a decade ahead is needed.
### Main drivers for the Finnish Virtual University

According to the Ministry of Education, the following factors have been the main drivers for the Finnish Virtual University:

1. The knowledge society in general
2. Regional development – the need for education for all
3. The possibility of combining work and study

According to the FVU the following factors are the main drivers:

1. Finnish society is culturally accustomed to technological change
2. The Finnish government was very proactive in the area of ICT when the initiative was launched five years ago
3. Finland is an information society and needs a virtual university

### Main obstacles for the Finnish Virtual University

According to the Ministry of Education, the following factors have been the main obstacles for the Finnish Virtual University:

1. Insufficient knowledge (technological and pedagogical) among teachers
2. Lack of high-quality ICT-based teaching material due to language barriers
3. Limited economic resources and lack of economic incentives.

According to the FVU the following factors are the main obstacles:

1. The organisational structure of the universities
2. Lack of common technical standards
3. Lack of incentives, especially since teachers are overburdened with tasks and need more time.

### Recommendations from the Finnish Virtual University to other European universities

The main recommendation emerging from the Finnish Virtual University initiative seems to be that it has to be accepted that construction of a networking-based national virtual university initiative takes time. It has to be constructed on a ‘win-win’ strategy for all partners involved, and must be accepted by all key players.
Focusing on the educational setting, the recommendations from Helsinki University are:
1. One always needs good teachers. Virtual structures or institutions are no exception
2. Support services to students through the use of tutors, for instance, are crucial
3. The learning material has to be of high quality, and must also address the fact that there are huge differences between the students and their learning paths
4. A virtual pedagogy is required

2.6. Sources and links

Interviewees
- Professor Matti Jakobsson, Rector, University of Vaasa; Chairman of the Steering Committee, Finnish Virtual University
- Professor Pekka Kess, Director, FVU Development Unit
- Mr Markku Markkula, Director, HUT Dipoli
- Professor Hannele Niemi, Dean, University of Helsinki
- Ms Marja Kylämä, Senior Adviser, Ministry of Education
- Ms Eija Ristimäki, Head of PR and Communications, FVU Development Unit
- Mr Kari Salkunen, Project Officer, FVU Development Unit
- Professor Hannele Niemi, Dean, University of Helsinki
- Ms Päivi Virtanen, Researcher, University of Helsinki
- Ms Tuula Rosin, ICT Advisor, Helsinki School of Economics
- Ms Maija Tammelin, Lecturer, Helsinki School of Economics
- Ms Kicka Lindroos, Project Co-ordinator, Swedish School of Economics and Business Administration
- Ms Kerstin Salminen, Lecturer, Swedish School of Economics and Business Administration
- Mr Pertti Saariluoma, Professor, University of Jyväskylä
- Ms Terhi Wermundsen, Senior Researcher, HUT Dipoli
- Mr Peter Ahlroos, Education Technologist, The Learning Centre, Tritonia
- Ms Maria Byholm, Learning Centre Educator, The Learning Centre, Tritonia
Contact information
Finnish Virtual University
FVU Development Unit
PL 1100
02015 TKK
Finland
E-mail: virtualuniversity@virtualuniversity.fi
Web address:
http://www.virtualuniversity.fi

Strategy
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• University of Helsinki, *Strategic plan for the years 2004-2006*, 2003

• ICT Cluster Finland, Review 2003

• **Avtal om flexibel studierätt** (agreement on flexible choice of studies). Agreement signed by all Rectors of Finnish Universities, 2003
3. Case profile for the Open University of Catalonia (UOC), Spain

This case profile includes a presentation and analysis of the Open University of Catalonia (UOC) in Spain. The case study is one of eight carried out as part of a strategic study of virtual models for universities. The eight best practice case studies have the purpose of enabling an in-depth understanding of the various models of ICT integration in universities, and also of the trends and perspectives they provide in relation to future scenarios.

The case profile is based on written material on the UOC and interviews carried out during a site visit to the university in May 2003.

The profile starts out by introducing the virtual university and its background. A description of the organisational model of the university and its business model follows. Then the co-operation model for how and why the university co-operates with other universities is presented, as well as an account of how and why the university co-operates with public and private partners. Then the pedagogical model and a description of the experience gained with this new model of learning and teaching are presented. The case profile ends with an overview of the outcomes and lessons which can be drawn from the case of the UOC.

3.1. Presentation and background

**Background information on the case study institution**

The UOC is a fully virtual university founded in 1995. The Catalan name for the university is Universitat Oberta de Catalunya, shortened to UOC. The English name for the university is the Open University of Catalonia.

The UOC is a regional initiative. The university was created by the government of Catalonia (the Generalitat), its key initiator. Other founding members were the Catalan Federation of Savings Banks, the Official Chamber of Commerce, the Industry and Navigation of Barcelona, Televisió de Catalunya, SA and Catalunya Ràdio, SA.
The government of Catalonia wanted an open distance university like the ‘Open university’ in the UK. Its goal was to create a university that made higher education accessible to people who for reasons of work, place of residence, age or other personal reasons could not study at a traditional university, but would prefer to take advantage of a distance education system.

The Catalan government gave this assignment to Professor Gabriel Ferraté, who developed the idea of a distance university into that of a virtual university accessible anytime and anywhere. At the UOC it is emphasised that the development of the concept into that of the third generation distance university (i.e. university based on Internet) is based on the visions of Professor Ferraté, who put ICT at its core. Today Professor Ferraté is the rector of the UOC.

The UOC is a distance university where learning is in focus supported by ICT and a new concept of pedagogy. There is no campus and there are no offices where students can turn up. Instead, all contact with the university takes place on the virtual campus.

As far as the student is concerned, information, teaching and administration are all connected via the virtual campus, and there is no necessity for them to intersect in either time nor space.

Though the university does not have a physical campus, it has a headquarters building located in the city of Barcelona.

According to the last published Annual Report of the UOC covering the years 2000–2001, by 2001 the UOC had 15,222 students. The average student is aged between 25 and 45. 95% of all students are working, and 57% of them already have a university degree.
3.2. Organisation, management and business model

A new university with a new organisational model

In its organisational model the UOC has sought not to centre itself around faculties and subjects. Instead it has been a goal of the UOC to place the student at the centre. Departments, programmes, and projects are designed in accordance with the needs of the individuals and groups to which they are addressed. The UOC does not so much look for comparisons and inspiration among the other universities of Europe as it does among business schools, which are much more market-oriented in their approach to managing educational institutions. The newness of the university is seen as being an advantage. New attitudes as well as new organizational and pedagogical models have been developed, and there is no mention of ‘we used to do this and that’.

The UOC is a virtual university organised as a network

The UOC defines itself as being a networked organization. About 900 people work at the UOC full time. Of these, 150 are teachers, 450 are administrative, technical and management staff, and 300 are employed in companies owned by the UOC.

Compared to other universities there are very few administrative staff at the UOC. Administrative tasks normally performed by clerks and secretaries are instead taken care of by academic staff, technical employees, or outsourced. The outsourcing is both to external private companies and to companies owned by the UOC. The UOC has its own private companies which specialise in fields such as the development of course material. By outsourcing these tasks the university ensures that they are accomplished at competitive market rates.

Teachers are getting new roles

At the UOC, teaching is organised in a novel way. The teachers acquire new roles, and new types of teacher are being integrated into the university’s pedagogical model. The UOC has three types of teaching staff:

- Teachers
- Counsellors
- Tutors
The teachers’ tasks are to assess the progression of courses, evaluate their quality, and monitor the counsellors and tutors working on courses. The full-time teachers have very little or no contact with students. The teachers at the UOC do a great deal of administrative work. In the beginning experienced teachers from other universities were employed at the UOC, but it became apparent that it was too hard for these teachers to adapt to the new organisational and pedagogical model of the UOC. Now mostly young teachers work there. All the teachers are being trained in the new pedagogical and co-operation models used at the UOC.

Tutors and counsellors run the courses. They are the people who have direct contact with the students. The tutors are responsible for the course content, while the counsellors act as ‘coaches’ who maintain contact with the students and ensure they are making progress with their studies. The tutors and counsellors work about 10-12 hours a week for the UOC. The tutors and counsellors sign contracts with the university for a semester at a time. Of these about half are teachers at other public universities in the region, and the other half work outside the university as lawyers, economists, judges or in other professional categories.

At the UOC no single teacher has full control of a course. Tasks are divided among different specialised staff. The full-time teachers are responsible for the study programmes, and the counsellors and tutors keep in contact with the students following the courses. The teachers do not themselves develop the material they use in their courses. Instead, the learning material is developed through co-operation between an author, a publisher, the finance department and the full-time teacher responsible for the course. This mode of organising the teaching has various advantages and disadvantages. On the one hand this model specialises and professionalises all the different aspects of the teaching process, but on the other hand it eliminates the academic freedom of the university’s teachers.
There are few full-time and many part-time teachers employed at the UOC. About 150 teachers work full-time, and 2000 work part-time as counsellors and tutors. With few full-timers and many part-time teachers the university is very flexible. With part-timers it is possible to take on just the staff needed for the courses requested by students and such part-time teachers are easy to lay off again. With this model the university is very dependent on there being enough people interested in working as full-time teachers handling a great deal of administrative work or as part-time teachers without permanent contracts, but according to the planning and quality director the UOC has no problems finding the staff it needs. However, it is noteworthy that young academics have great difficulty obtaining positions in Spanish universities, and for these the UOC may represent the sole entry route into academia, a fact which the UOC is taking advantage of.

Great challenges on the management and the organisation

The way the UOC is organised is a great challenge to the organisation, requiring new roles, new tasks, the involvement of many different groups, a great deal of planning, ensuring the right tools are available to the different groups, monitoring their efforts, and not least, convincing them about the benefits of this new way of teaching and working as a university. This demands a need for strong and visionary leadership, as well as a flexible and unbureaucratic organisation which empowers its employees. The UOC has grown and developed very fast, and there is a need to ensure that the correct organisational structure exists to support the employees in their work and co-operation. This will be a continuous organisational challenge for the UOC to have to tackle.

It is seen as a great strength for the university that the rector of the UOC is not elected as in public universities, and that the goals of the university are not set politically. The university is run as a private institution, and the rector only keeps his seat as long as he continues to achieve the university’s goals and keeps developing the institution. The importance of possessing a management which is capable of thinking strategically is emphasized. Management must be able to keep up, move fast and be willing to take chances and risks.
Technical solution – the UOC has developed its own virtual campus

The UOC has developed its own technical solution in the form of the virtual campus. This virtual campus is at the core of the UOCs activities. In the first place, it is used for all communication between the administration, teaching staff and students. Secondly, it is being offered free of charge to non-profit entities. Thirdly, it is being sold as a commercial product to private companies.

The UOC has no real-world campus expenses, and has therefore been able to invest that much more in technology.

The UOC has created spin-off companies

The UOC is very oriented towards innovation and the market, and on the basis of its experiences and activities in net-based learning it has created several companies, such as:

- **E-strategies.** A consulting firm for the design and implementation of e-learning strategies.
- **Eurekamedia.** A publishing house that designs and digitises learning material. It is developing learning material for the UOC, but it also offers its services on the private marketplace.
- **GEC.es.** A consulting firm for design and implementation of e-internet strategies

These companies are closely connected to the university. The experience gained at the university feeds into the companies, and the university’s trust in the companies is ensured via their relationship to it.

The UOC recommends that other universities create companies. At the UOC these companies are seen as a way of giving value back to society, but it also represents a new way of funding the university. As a precondition for creating companies, however, the UOC points to the importance of being innovative, specialized and fast-moving. The UOC believes it is the first university in Europe capitalizing on its experiences with e-learning in the private marketplace. The UOC has the advantage of being the first mover in a new higher education-level e-learning market.
Funding of the UOC – many sources

The UOC had in 2001 an ordinary annual budget of 4.8 billion PTS and an investments budget at 793 million PTS (annual report 2000-2001). This is funded by different actors:

About 30% of the budget comes from the government of Catalonia, which funds:
- Initial education of Catalan students
- Some research

About 70% comes from other sources:
- Initial education for Spanish citizens (from outside Catalonia) are paid for by the Spanish government
- Supplementary academic training offered by the UOC are paid for by the students and the companies which buy its courses
- The services offered by the companies owned by UOC are bought by both private and public organisations.

To keep receiving funding from the government of Catalonia, the UOC has to be able to show certain results. Every four years an agreement between the UOC and the government of Catalonia is agreed which contains different targets for the university, and includes parameters – such as graduation rates and student assessments of the UOC – which the UOC must maintain in order to receive its government grant.

The UOC is an institution which is focused on co-operating with both public and private partners in various ways. Different partners support the UOC and sponsor initiatives at the UOC. The UOC has also created its own companies as spin-offs from its own activities. These companies are an additional source of income.

As far as the budget is concerned, it can be noted that the university saves a large amount of money by not having a campus. With less funding spent on investing in buildings and campus facilities, there is more for investment in staff and technology. Here
the UOC has very clearly prioritised staff and technology, and this is seen as a great strength of the university.

At the UOC it is believed that in the future universities will be making money from other activities than offering the initial academic training funded by the government. Universities will involve themselves in more diverse and numerous activities to obtain funding.

**UOC business model**

The strength of the UOC institutional model is seen as lying in:
- The university is run an innovative institution
- The fact that the university is run as a business.
- A clear focus on the customer and expanding markets.
- A clear focus on being a virtual university. No extra expenses on campus facilities.
- The university is operating through other activities than offering initial academic training funded by government; more diverse and more numerous activities to make money.

The UOC being a private institution with a public grant represents two factors which confer extra strength on the UOC. Being a private university ensures great freedom for the university, but the UOC still gets public funding. Other private universities in Catalonia do not receive public funding, but the government of Catalonia is paying for initial academic training at the UOC. This funding is based on the UOC fulfilling goals set between itself and the regional government every four years, but apart from this it can freely develop other areas of interest. These two aspects combined make the UOC more flexible than other public universities while at the same time guaranteeing some funding, giving it a financial security that the other private universities do not possess. Embedded in the Catalan public university system while still remaining independent, it can be said that the UOC is enjoying the best of both worlds.
3.3. Co-operation with other universities and private companies

Co-operation a key principle at the UOC

Collaboration with its surrounding context is one of its ten principles (Principle number 8). It is evident that the complex nature of the world today makes collaboration inevitable, but at the same time the use of ICT makes it easier. The UOC has formed many alliances, and co-operates with universities and both public and private partners.

Co-operation with universities in Catalonia

The UOC co-operates more with the universities of its own region of Catalonia than with Spanish universities in general. Though the UOC is a private university, it has a special relationship with the Catalan public universities. An agreement has been concluded between the UOC and these universities whereby teachers who want to have a new experience as professors of a new concept of university may work part-time for the UOC. In this way the UOC ‘borrows’ professors and teachers from the Catalan public universities. In addition, classrooms on the other universities’ campuses are used for holding examinations.

Claudi Alsina, General Director of the department responsible for Universities in the Government of Catalonia foresees that in the future all the region’s universities will become more virtual. He has a vision not of the UOC standing out in its ‘virtuality’, but of all the universities offering courses in e-learning format and containing virtual campuses. A factor supporting such a change is the many part-time teachers working for the UOC. Many of these teachers also work at other universities, and when they are working for the UOC they are acquiring new skills and experience in using ICT. These teachers could become agents for change at the traditional universities after being inspired by their UOC experience, demanding greater ICT integration there. In this way the UOC might become a driver for the integration of ICT into other universities.
Co-operation with universities in Latin America

The UOC also co-operates with universities in other countries. The UOC emphasises that it is not entering into franchise agreements or letting other universities use its virtual campus, course material and concept simply to make a profit. Instead, the emphasis is on co-operating with other universities to take advantage of their respective strengths, with each party becoming stronger together. The goal of co-operation is to create a win-win situation.

The UOC has started co-operating with universities in Latin America because there are no language barriers there. A joint diploma has been developed with a university in Argentina, and the UOC is also working with universities in Mexico. When it enters a Latin American market the UOC seeks out local partner universities which then provide local tutors and counsellors.

The key challenges for co-operation between universities are considered to be language barriers and national curriculum standards. The language obstacle can be considerable, as the written language is a key element of the virtual campus. Offering language courses in Spanish alongside other courses has been suggested. Developing and co-operating on joint degrees is easier in countries where universities are free to set their own curricula. These two challenges are also regarded as being the chief obstacles to co-operation in Europe. At the European level, further development of the ECTS system is seen by the UOC as important for developing greater co-operation.

Virtual mobility between universities via a meta-campus

The UOC is working on developing a ‘meta-campus’ to support virtual mobility. A meta-campus will connect the virtual campuses of several universities. Though the meta-campus, students at one university will be able to follow courses at the virtual campus of another university, with the virtual campuses of the universities being connected through the meta-campus. The meta-campus is not yet a reality, but such a project is under development at the UOC.
The UOC is co-operating with both public and private partners in various ways. Many institutions, corporations and bodies, both public and private, co-operate with it. Both public and private partners were involved in the foundation of the UOC and are represented on the university’s Board of Trustees and Standing Committee.

Different possible forms of co-operation with the UOC are described on the UOC’s homepage:
- Supporting the UOC or the UOC’s support centres
- Sponsoring UOC initiatives
- Suppliers can become part of the UOC’s consumers’ co-operative whose products and services are offered to the university community.

According to the most recent annual report (2000-2001), the UOC that period signed agreements with ten towns and three regional councils, as well as many institutions, foundations, associations and professional associations. The UOC is also co-operating with NGOs through the ‘Campus for Peace’ programme on a non-profit basis.

As noted earlier, the UOC management believes that in the future universities will be involved in more diverse and numerous activities in order to secure funding. The UOC is very aware that the learning market is not restricted to universities, as consultants and course providers are entering the market with new actors such as publishing companies. It has done two things to meet this challenge.

Firstly, it has created its own companies to offer consultancy services, publishing services and courses in order to participate in this new extended educational market. It can be noted at this point that the UOC has signed an initial agreement with the government of a Chinese province which is interested in its platform, concept and training for local teachers. This co-operation is expected to develop within four or five years.
Secondly, the UOC has concluded strategic agreements and embarked on closer co-operation with private enterprises. This has happened, for example, with the Planeta publishing house. Instead of being competitors, the UOC and Planeta are trying to develop learning material for initial and supplementary academic training together. The saying, ‘If you can't beat ‘em, join ‘em’ is quite applicable here. It has been the objective to ensure a win-win situation, and according to the UOC this has been possible.

3.4. The educational setting

The UOC offers both basic and supplementary academic training. The UOC sees it as a great advantage that it is an independent university with the right to award degrees. The UOC believes it has a stronger and better offering because it is free to move in the marketplace.

To make a virtual university such as the UOC profitable, many students are needed and at the UOC there is great awareness of the need to target a large and growing market. Therefore the UOC is targeting:

- People wanting initial academic training as well as supplementary academic training
- 25-50-year-olds who either left university without completing a degree or who want to develop skills in new areas
- ICT-literate individuals with access to the Internet
- Those in employment, so that either they or their employers can pay for their courses
- Both nationally and internationally

These target groups are growing. Increasingly more people are getting access to the Internet and have the necessary skills to be able to use a virtual campus; additionally, the demands of a knowledge society increase the need for education.

The UOC is solidly involved with Catalonia, where it is geographically based, but it also has students in the rest of Spain. 14,428 of the 2000-2001 students followed courses delivered in
Catalan, and 794 in Spanish. The UOC is also opening up to the rest of the world, since the Internet is inherently international. The UOC is currently developing its involvement in Latin America, but doing so in the rest of Europe will be more difficult. A key limiting factor is the language barrier, since its courses are delivered in either Catalan or Spanish. Another challenge in the international market is the competition from US and Australian universities which already have great experience and large market shares.

The UOC offers different types of courses covering both initial and supplementary academic training:

- Initial academic training
- Masters
- Doctoral programmes
- Summer school
- Educational services for institutions and enterprises

About half of all the UOC’s offerings consist of initial academic training, the other half of supplementary academic training. The UOC is focused on the need for lifelong learning, and sees it as its duty to offer both initial and supplementary training. This is captured in the motto on the UOC homepage, ‘From Once-in-a-lifetime Education to On-going Education’.

A strong focus on the market for supplementary training is part of the UOC strategy. There is a new and growing market for lifelong learning, and in Spain this market is not dependent on government funding, but on the students who are paying for their courses themselves. With supplementary training, the UOC is free to offer any courses the market is demanding. Other universities are also active in the supplementary training marketplace, but the UOC believes that these institutions are not as focused as the UOC is. Private course providers are also active, but since they cannot offer a university degree the UOC has a competitive advantage here.

Although it has an emphasis on supplementary training, the UOC will keep offering initial academic training. As a future trend the
UOC believes that initial academic training will develop alongside the expansion of the ECTS system and the Bologna process. The UOC sees advantages in covering the whole tertiary education market, one of them being the opportunity to split the development costs of educational material among its different levels.

Focus on being a 100% virtual university

According to Mr. Duart, director of International Projects, the UOC is highly focused on being a fully virtual university using a virtual campus.

<table>
<thead>
<tr>
<th>Space constraints</th>
<th>Time constraints</th>
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<tr>
<td>e.g. situated learning</td>
<td>No time constraints</td>
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<tr>
<td>e.g. support centres</td>
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<td>e.g. videoconference</td>
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On the UOC virtual campus a flexible study space which is adapted to each student's individual circumstances is possible. Very little face-to-face interaction is offered at the UOC. Though meetings are offered at the beginning and end of a course, they are not compulsory. It is possible to follow a UOC course and never show up at any meetings. The support centres are not an integrated element in the courses; they are simply places where it is possible to obtain information and help. These factors ensure that there are neither time nor space constraints for the students, and offer them full flexibility.

UOC pedagogical model

The aim of the UOC is to offer high-quality distance teaching through the application of innovative pedagogical systems and the use of interactive multimedia technologies.

The UOC has developed its own pedagogical model, with the student placed in the centre. The UOC stresses its focus on the student and how everything is built around him, such as administration, teaching and learning resources.
Concerning its pedagogical model, the UOC writes that ‘university students learn because the methodology employed brings them face to face with knowledge in a particular way, obliging them to resolve problems, to search for more information, to compare it empirically or by means of alternative sources, and to work co-operatively’. 

In the virtual campus the students are in the centre, with their learning being supported by different types of resources such as study materials, tutors and counsellors, and continuous assessment. A course has a schedule and a classroom. Every classroom has about 50-60 students for every counsellor and tutor. The tutor is responsible for the content of the course, while the counsellor acts as a ‘coach’ who maintains contact with the student and ensures progress. About half the tutors and counsellors are teachers at other universities, and the other half are professionals such as lawyers, economists or judges. This blend of academic and real world experience is seen as a source of strength in the pedagogical model.

Though the UOC students do not come to a physical campus, this does not mean that they are not connected to the university. Through the virtual campus students can engage in dialogue with counsellors and tutors, take part in colloquia with their colleagues, or carry out any relevant academic transactions such as checking the books available at the UOC library or in the remainder of the university libraries of Catalonia. The tutors and coun-
sellors are present at the virtual campus in order to create the constant attention and stimulus required for activity and learning in distance education. Students are urged to participate in debates with teachers and other students, and to work collaboratively. The UOC considers that there is considerable interaction between the students and the teacher, and among the students themselves.

The UOC’s drop-out rate is very small, and via a survey the students have stated that they are generally satisfied with studying at the UOC.

The UOC develops its own digital learning material for all courses. The UOC’s largest investment is not in buildings, but in developing learning material. This is pre-produced, and it takes as long as 9-12 months to develop learning material for a course. The teachers do not develop their course material themselves; instead, it emerges via a co-operative process involving an author, a publisher, the finance department and the full-time teacher responsible for the course.

The development of learning material is very time-consuming and costly. A great challenge in the development of digital learning resources is the continuous need for updates, and the issue of how to make the investment worthwhile. To optimise these aspects the learning material is modular and follows defined standards to make it easy to reuse (from a technical point of view, the material is based on XML). This enables interchangeability of course components between the courses. For example, one goal is to reuse learning material from initial-level degree courses for supplementary-level courses, and vice versa. Until now only a little learning material has been sold to other universities, but it is being shared with them under co-operation agreements. The learning material developed at the UOC is owned by it, not by the teachers. The UOC has created its own publishing company, Eurecamedia, which specialises in the editing and production of multimedia pedagogical material for the UOC, but also sells its services to other interested parties.
The students at the UOC get access to all learning materials at the virtual campus. No material is sent to the student in paper format.

**Support centres not used by students**

The UOC has created centres both throughout Catalonia and internationally where the public can visit the UOC. These were originally developed as centres designed to guarantee the students access to the Internet, and to support the non-ICT-literate students. However, in practice the students did not use the study centres for this purpose as they already had internet access.

Now the study centres are being used to provide information about the UOC and for marketing purposes. The study centres and the computers purchased for the students are being used instead for ICT courses which are open to the general public. This is being done in collaboration with the local town councils. In this way more people are becoming ICT-literate, and in the long term they represent new potential students of the UOC.

### 3.5. Outcomes and lessons learned

**Strengths of the university**

- The UOC has had the competitive advantage of being one of the first universities in the new higher education-level e-learning market
- As a new university the UOC has grasped the opportunity of rethinking all aspects of the university. There is no ‘we used to’ at the UOC. Willing to take chances and follow new roads.
- A private university funded by public grants. More flexible than public universities, but guaranteed public funding.
- A networked organisation. The organisation is more flexible with less administrative staff, fewer full-time teachers and more part-time staff.
- A new pedagogical model has been developed in accordance with the specific focus on the challenges of e-learning.
Clear focus on co-operation with other universities and partners, both public and private.

University owns companies. This both gives knowledge back to society and provides funding for the university.

Clear focus on student, as main subject of the whole learning process and in a lifelong perspective being able to learn, unlearn and relearn continuously.

Weaknesses of the university

- New roles and tasks for staff. Academic freedom challenged. No job security for the many part-time tutors and counsellors.
- Very time-consuming, and costly to develop digital learning material and keep it updated.

Main drivers for ICT integration at the University

- Clear focus on being a network university. Virtual campus at the core of the university.
- The numerous students studying at the university and the low drop-out rate are evidence that the virtual campus and the use of pure e-learning represent an important educational offering.

Main barriers for ICT integration at the University

- Difficult to change the culture and mentality of people. With both a new organisational and pedagogical model there are many simultaneous changes. Staff find it difficult to work in a networked organisation. Not using the full potential of the UOC model.

Recommendations from the UOC to other European universities

- The UOC recommends the very clear prioritising of resources for staff and technology. With less funding being spent on buildings and campus facilities there is more for investing in people, learning innovation, quality, and technology.
- Focus on supplementary training. A growth market.
- The UOC recommends other universities to create companies, though an important precondition for this is the ability to innovate, specialize and move quickly.
3.6. Sources and links

**Interviewees**
- Carles Esquerre, Deputy General manager
- Josep Mª Duart, Director of International Projects
- Josep Salvatella, Quality and Planning Director
- Lluis Tarin Martinez, Director Extension University
- Mark Jeffery, Teacher of Law
- Antoni Martinez, Marketing
- Marta Ferrusola, International Projects Coordinator

**Contact information**
Open University of Catalonia (UOC)/Universitat Oberta de Catalunya
Av. Tibidabo 39-43
08035 Barcelona
Spain

**University website**
Website: [http://www.uoc.edu/](http://www.uoc.edu/)

**The UOC’s ten principles**
The ten principles of the UOC in English:
[http://www.uoc.edu/web/eng/university/indexhome.html](http://www.uoc.edu/web/eng/university/indexhome.html)

**Technology**
Descriptions and data regarding the technological platform of the UOC:

**Annual report**
*Annual Report of the UOC 2000 – 2001*
[http://www.uoc.edu/web/cat/universitat/memoria/eng/memoria/home.htm](http://www.uoc.edu/web/cat/universitat/memoria/eng/memoria/home.htm)
4. Case profile for Politecnico di Milano, Italy

This case profile comprises the presentation and analysis of the integration of ICT at the Politecnico di Milano in Italy. The case study is one of eight which have been carried out as part of a strategic study of virtual models for universities. The eight best practice case studies have the purpose of enabling an in-depth understanding of the various models of ICT integration in universities, and also of the trends and perspectives they provide in relation to future scenarios.

The case profile is based on written material on Politecnico di Milano and interviews carried out during a site visit in June 2003.

The profile starts out by introducing the university and its background. A description of the organisational model of the university and its business model follows. Then the model for co-operation with other universities is presented, as well as an account of how and why the university is co-operating with public and private partners. After this the experience of ICT integration and e-learning in an educational setting is described. The case profile ends with an overview of the outcomes and lessons which can be drawn from the case of the Politecnico di Milano.
4.1. Presentation and background

Background information on Politecnico di Milano

The Politecnico di Milano is acknowledged as the most important Italian university of engineering, architecture and design. It comprises seven campuses in northern Italy (six of them in the Lombardia [Lombardy] region) in six different cities as shown in the figure below:

The academic programmes are split among nine colleges:

- 2 colleges of architecture
- 1 college of design
- 6 colleges of engineering

Through its colleges the Politecnico di Milano offers 27 different courses. In addition, the School of Doctoral Programmes offers 30 PhD programmes.

More than 38,000 students are studying at the Politecnico, and the permanent academic staff numbers more than 1000.

ICT strategy: The Politecnico model

The Politecnico di Milano has no systematic ICT strategy, but has produced a leaflet entitled "E-learning: Il modello Politecnico" which outlines the reasons and strategic goals for ICT integration and e-learning at the Politecnico di Milano. In the leaflet’s intro-
duction the Rector, Professor Giulio Ballio, outlines two main reasons for focusing on e-learning:

- The distributed campus with its seven different locations has been a main driver for the use of ICT, which is being used as a means of bringing students and teachers closer together.
- The experiences of overseas universities like the British Open University, the Cardean University and the Open University of Catalonia have been valuable for benchmarking and shaping the Politecnico di Milano’s initiatives.

The Rector also emphasises that the Politecnico di Milano’s e-learning model is one which demands greater activity from the student than traditional courses. The student has to be involved in the courses and co-operate virtually with the professors, tutors and other students.

"E-learning: Il modello Politecnico" explains the basic principles of the Politecnico di Milano’s methodological approach to e-learning:

- **responsibility for educational process** – the Politecnico assumes total responsibility for ensuring the quality of production, course quality, and the delivery of e-learning services. It refuses to accept independently-created curricula that do not meet its preparation standards;
- **ad hoc design** – user requirements and project features are the main elements in distance learning design;
- **value-added services** – both content and services are crucial in distance learning. To this end, effective patterns of student-student, student-tutor and student-teacher communication are being researched;
- **roles in the learning process** – the teacher’s role is shaped more by the learning of the users than by particular techniques of teaching. The role of the tutor is crucial for linking students and teachers;
- **collaborative learning** – the collaborative dimension of learning in education and training is also exploited in distance learning;
- **feedback and continuous monitoring** – information based on evidence not only of the users' learning level, achievements and global satisfaction, but also on the quality requirements of the e-learning service;
- **learning by doing** – an active and inductive approach to learning is aimed at eliminating the passivity of individual computer self-study;
- **learning agenda**, including enjoyment of learning activities – assignments and homework are scheduled with specific dates centred on learners' requirements in order to ensure time management flexibility and maintain a regular learning rhythm.

According to the Politecnico di Milano, each e-learning project integrates four critical dimensions:
- **didactics** – educational approach, learning styles, content structure and learning level etc.;
- **technology** – features and performance of course delivery platform, users' equipment etc.;
- **project management** – business plan, budgeting, benchmarking etc.;
- **communication** – promotional campaigns, training, support of teachers, tutors and learners, customer care services etc.

In order to manage these dimensions, the Politecnico di Milano schedules step-by-step reviews for the design, prototyping, implementation and delivery of each e-learning service in order to validate its effectiveness and efficiency. Process indicators are used for this purpose. In this manner it is possible to identify and correct time process anomalies and to continuously improve the quality of the e-learning.

The Politecnico di Milano has established the METID centre as a facilitator for ICT integration and e-learning (see the description in later paragraph).
The Politecnico di Milano has been using distance learning since 1992 to unify its seven dispersed locations. Through its projects the university has obtained very useful pedagogical and organisational experience in distance learning which it has applied to its most recent e-learning projects. The most important current projects of the Politecnico di Milano are as follows:

Laurea OnLine (http://www.laureaonline.it/): This degree in Computer Engineering is the first Italian university degree to be offered entirely online. The project started in 2000, and the first students will complete their studies in July 2003. The project was a consortium involving the Politecnico di Milano and Somedia (a part of the Espresso-Repubblica publishing group). All the study activities are in e-learning format. The e-learning is based on 33 CD-ROMs containing the material for the 26 course components, a web portal (discussion fora, agenda, notice board, personal e-mail) and virtual classrooms (two online lectures per week with audio, chat, electronic blackboard, shared applications). 15-30 students participate in each lecture. The students also have access to a tutor to guide them through the course.

Three times a year, a week of examinations takes place in Como. In June 2003 around 380 students were enrolled in Laurea OnLine. One third of them are from the Lombardia region, a further third from Northern Italy, and the remainder from the rest of Italy. Most of the students are working alongside their studies. There was a substantial drop-out rate from the degree course, especially at the beginning. According to the Politecnico di Milano this is mainly because of the unrealistic expectations of these students, who thought it would be easier to take a degree on-line.

Laurea OnLine is an ongoing project which will continue in future years.
Corsi On-Line 2 (http://corsi.metid.polimi.it/): This system is used to support face-to-face teaching. Materials are posted here for the courses being held on campus, and virtual communities are created. More than 350 courses are listed in the Corsi On-Line (20-25% of all the Politecnico di Milano’s courses). All the teachers can use it, but it is not compulsory for them to do so. The teachers can also develop self-assessment exercises for the students. Manuals have been produced for both teachers and students in order to enhance the usability of the system.
Math OnLine ([http://www.mathonline.it](http://www.mathonline.it)) – This project is based on the co-operation which exists between the Politecnico di Milano and the regional school office in Lombardy (Ufficio Scolastico per la Lombardia). The objective is to teach high school students mathematics online, arising from the fact that many students have too little competence in mathematics when entering university. The project focuses on Lombardy high school students wishing to attend a scientific and technological university. The project is very innovative in the organisation and approach of its mathematics teaching; the concept uses a blended learning model relying considerably on the selection of exercises and the use of games and competitions among the students. The course lasts 5 weeks, involving around 50 hours of student work. Tutors are also involved in the project.

In 2002-2003, 180 high school students participated, and 400 will participate in 2003-2004. The partners are considering ways of expanding the course even further.
Master NBA (http://www.masternba.it/) – This e-learning based Master in Net Economy has been developed in co-operation between the Politecnico di Milano and Sfera (a company in the ENEL group). Around 80 students are following this masters course, which teaches innovative management skills for the Net Economy via online classes and tutoring. The pedagogical basis of the course is a model developed by Sfera.

Progetto Disabili – The service which this project offers is specially designed to respond to the needs of the Politecnico di Milano’s disabled students, enabling them to follow campus-based lessons from home. The students are provided with laptop com-
puters hooked up to the University network. A portable multimedia kit records the lessons, and the recordings are streamed so that the lessons are available to the disabled students. The lessons are only available to these students; for instance, it is not possible for the other students to access the streamed lessons if they are unable to attend class in the normal way.

Politecnico di Milano is involved in several other e-learning projects. Information about these can be found at [http://www.metid.polimi.it](http://www.metid.polimi.it).

### 4.2. Management, organisation and business model

**Management of university positive towards ICT**  
The Rector of the Politecnico di Milano, Prof. Giulio Ballio, is very involved in the development of e-learning at the institution. The extended use of ICT integration and e-learning is a core element in the Politecnico di Milano’s strategy. Based on his experience, it is the opinion of Professor Ballio that more blended solutions should accompany the pure e-learning models. The fact that employees who are given the opportunity to take a course at university level expect to travel as a kind of extra bonus needs to be taken into account.

**Different units working with ICT integration**  
METID (Metodi E Tecnologie Innovative per la Didattica – methods and technologies for innovative didactics, see [http://www.metid.polimi.it](http://www.metid.polimi.it)) is a unit at the Politecnico di Milano whose task is to develop the use of ICT in campus-based education as well as for e-learning projects. METID also supports the lecturers in using ICT in their teaching. Prof. Alberto Colorni, who is also teaching at the Politecnico di Milano, leads the centre and its circa 25 employees. Over the past twenty years Prof. Alberto Colorni has been heavily involved in the development of the Politecnico di Milano’s e-learning pedagogical model. The centre was founded in 1995. METID is responsible for the contact with the various projects’ external partners, and also monitors general developments in Italy and at international level.
CEFRIEL (http://www.cefriel.it/) is an information technology education and research centre focusing on collaboration between the Politecnico di Milano and industry.

MAP (http://www.mapress.org/) is a consortium for the development of competences in the multimedia sector, and also focuses on co-operation between the Politecnico di Milano and industry.

MIP (http://www.mip.polimi.it) is one of the leading units focusing on postgraduate education in business, and has its own e-learning based MBA. It also runs about 15 short courses targeted towards private companies. Additionally, MIP works with the World Bank to develop programmes for SMEs in developing countries, and focuses heavily on general fundraising for further projects.

POLIEDRA (http://www.poliedra.polimi.it) is a university consortium founded by the Politecnico di Milano to promote and develop continuing education, with a special emphasis on distance education.

Well-developed technical infrastructure

The basic infrastructure of the Politecnico di Milano is well developed. And as mentioned previously, several student services exist, including self service regarding administrative issues.

Funding

The funding of the ICT integration is based on:
1. The Politecnico di Milano’s self-funding from the sale of hardware and services primarily produced by METID for use on the campus.
2. Public-private partnerships in e-learning projects.

Business model

The business model of Politecnico di Milano in the e-learning area has very much been based on partnerships both with private companies such as Somedia and Sfera, and with public institutions such as the regional school office in Lombardy (Ufficio Scolastico per la Lombardia). The business models have varied slightly, but in the partnerships Politecnico di Milano has mainly been responsible for the production of content and the teaching. In the Laurea OnLine project, Somedia was responsible for the technology. In or-
order to take their Laurea OnLine courses students paid the normal tuition fee to Politecnico di Milano and the same amount to Some- dia. Because of the substantial drop-out rates, the degree course has not resulted in good business for Somedia.

The business model for the co-operation with Sfera on the Master NBA is based on total financing by Sfera (for both the technology and the work of the teachers). Sfera can use the learning objects inside the ENEL group, and the products are jointly owned by Politecnico di Milano and Sfera. Half of the students' tuition fees are paid to Sfera. According to Valerio Eletti, Sfera will be unable to fi- nance the development of any future projects at the same level as with the Master NBA.

According to Prof. Giuliani Noci of MIP, e-learning is not very good business for the time being, but the Politecnico di Milano has to stay in it because of the pressure of competition and because it will take some time for business to get better. A lot of the big compa- nies are reluctant to send their employees to e-learning courses because some years ago they invested in e-learning platforms which they never managed to get to work properly.

According to Prof. Giulio Ballio, the future business model ought to be based on a consortium involving different partners (technology vendors, multimedia companies etc.). The Politecnico di Milano is considering this model for the future. It would not be project-based, but would be implemented on a larger scale in order to offer a num- ber of courses and services.

4.3. Co-operation and partnerships

The Politecnico di Milano is very much involved in project-level partnerships with public partners in the e-learning area, as well as with private partners. The strategic objective is to conceive a con- sortium which will propel the partnerships from project level to a more institutional level.
Co-operation with national and international universities on a project basis

The Politecnico di Milano is no longer a part of the Nettuno network in Italy (see the Italy country profile for further information). The Politecnico di Milano was one of its founding institutions, but chose to leave the network for pedagogical reasons. The Politecnico di Milano does not believe in broadcasting as a vehicle for high-quality e-learning.

The Politecnico di Milano is active in the Campus One initiative (see the Italy country profile for further information).

Co-operation with other Italian universities is limited to theUniversità Cattolica di Milano, which is responsible for the quality assurance of the Laurea OnLine project. Co-operation with other national universities is insignificant because of competition.

In addition to this, the Politecnico di Milano is a member of the Italian Association of E-learning (sie-l, http://www.sie-l.it) and Prof. Colorni is the sie-l President.

There are no current initiatives involving overseas universities in relation to the joint offering of e-learning courses, but this could be a strategic focus in the future.

Virtual mobility projects

The Laurea OnLine project concentrates heavily on the ability of students from all parts of Italy to enrol in its degree courses, something which requires virtual mobility. Regional identity is important in Italy, and virtual mobility is also high on both the general political agenda and on that of the Politecnico di Milano. It is important to enable students in the southern parts of Italy to study at the Politecnico di Milano without leaving home.

Co-operation with public partners

In the Math Online project the Politecnico di Milano has co-operated with the regional school office in Lombardy (Ufficio Scolastico per la Lombardia).

The regional office is heavily involved in different partnerships involving the twelve universities of Lombardy.
This project emerged from a discussion between the Politecnico di Milano and the Lombardy regional school office about the insufficient knowledge of mathematics among high school students, and their diminishing interest in natural sciences.

According to Rita Bramante of the Lombardy regional school office, their co-operation with the Politecnico has been excellent – so much so that the project has been expanded this year, and yet further expansion is now being considered. The project has made studying mathematics interesting, something which both the teachers and the students involved in the course agree on.

Co-operation with private partners

The Politecnico di Milano has been involved in several projects with private enterprise partners.

In the Laurea OnLine project the Politecnico di Milano co-operated with Somedia, which came into the partnership in order to generate business in this field. Somedia invested 4 million EURO in this project.

In co-operation with Somedia, the Politecnico di Milano is responsible for methodology, content, teacher provision and the courses themselves. Somedia is responsible for the technology and the learning platform (IBM’s Learning Space 5.0), and has also paid the teachers for developing the content. Through its OSSCOM unit the Università Cattolica di Milano is responsible for quality assurance, which is mainly achieved via focus group meetings.

The co-operation model of the Laurea OnLine project can be charted as follows:
According to Alessandro Alcevich of Somedia, the project has taught Somedia some valuable lessons. There was a clash of two different cultures, and in the course of the co-operation Somedia to some extent failed to make use of the Politecnico di Milano’s knowledge concerning how to respond to the market and take care of the customers, i.e. the students. Because of the current adverse market conditions, Somedia is not planning to repeat this kind of development project for the time being.

Valerio Eletti of Sfera thinks that its co-operation with Politecnico di Milano in the Master NBA has been very fruitful as regards the content development process. It has been very productive to discuss the best ways of communicating knowledge and transforming material into a suitable e-learning format. The teachers of the Master NBA think that having to reconceive their material in the pedagogical setting that Sfera had outlined really amounted to a culture clash; on the other hand, it really forced the teachers to structure their material, even though the model was possibly too rigid. The teachers emphasise that blended learning is needed for the models to succeed.

In the opinion of Professor Giulio Ballio, the Politecnico di Milano has learnt a lot from its co-operation with private partners. Most of all, it has learnt about customer care. It can be difficult to co-operate because the motives for the creation of e-learning are different. The Politecnico di Milano is involved in e-learning for educational reasons, the companies in order to make a profit. However, it is necessary to involve private partners in order to lower costs.
Assessment of extended EU and national co-operation

In the opinion of Professor Ballio there is a need for further EU-co-operation at three levels:

1. Extending the use of e-learning in the EU candidate countries
2. Extending the use of e-learning in the Mediterranean countries
3. Extending the use of e-learning in South America and the Spanish-speaking parts of the world.

For Professor Ballio, a consortium of European universities needs to be set up by the Commission to offer e-learning to the target groups mentioned.

Alessandro Alcevich of Somedia thinks there is a need to strengthen public-private partnerships. In this respect the Commission could grant money to the universities in order to encourage them to enter into partnerships with private partners.

4.4. The educational setting

The educational setting is changing

The educational context of the e-learning courses is different from that of the Politecnico di Milano’s traditional courses. There is much more interaction between students and teachers in the e-learning courses than during traditional lectures held in front of 300 people. These new ways of teaching are quite evidently also starting to affect how traditional teaching is undertaken at the Politecnico di Milano.

Changes in the role of the teachers

One of the frequently-mentioned drawbacks concerning e-learning is the lack of social interaction between students and teachers. This is not the case at the Politecnico di Milano because of the widespread use of the tutor system and the general pedagogical model. As one of the teachers from the Math Online course said, "I was becoming one of them [the students]". Her experience of online tutoring was that she had much more contact with the students, and this also changed her traditional teaching methods. As a Laurea OnLine project teacher said, “The philosophy of teaching in e-learning is completely different".
Three students from the Laurea OnLine project were interviewed for the case study. They very much agree that the role of a virtual teacher is different. "The teachers seem much more enthusiastic", said one of them.

**Changes in the students’ role**

The Laurea OnLine students think it takes something special to undertake an e-learning degree. It takes motivation, strength and willpower. They think that e-learning is not suitable for young students, but is appropriate for highly motivated students who are working alongside their studies.

**Much more focus on individual students**

The teachers state that they get to know much more about individual students in their e-learning courses. It is much easier to spot good students in a virtual environment than in a lecture room. The teachers feel that they are reaching students more than through traditional teaching. As one of the Laurea OnLine teachers said, she also felt that the human interactions were improved through e-learning, giving the possibility of more personal contact. Virtual friendships are growing through e-learning.

The Laurea OnLine students agree. There is much more contact in virtual learning environments, both among students and between individual students and their teachers. In a traditional setting there is little opportunity for discussion with one’s teachers.

At the MIP Institute all courses use the Corsi On-Line 2 portal. According to Professor Giuliani Noci, the result is an improved and much more extensive dialogue between students and teachers than occurs in the traditional weekly 2-hour classroom session. This has considerably changed the culture of the institution. It has also increased teacher efficiency, due to the opportunities for one-to-many communication about topics which were previously normally communicated one-to-one.

**High quality of e-learning**

The teachers think that the quality of e-learning is higher than in the traditional setting. E-learning creates opportunities for retrieving some of the students who dropped out of the university system years before. The teachers also feel pressure to deliver quality. As
the teachers in the Laurea OnLine project said, "Once your name is out there, you need to produce quality". The teachers state that while e-learning can be used to achieve a mediocre degree, producing poor candidates at a university like the Politecnico di Milano is not acceptable. The teachers of the Master NBA agree with this, and consider that the quality of e-learning is by no means lower than in traditional courses.

According to the students from the Laurea OnLine project, the quality of e-learning is high because teachers are forced to structure their teaching more rigorously in a virtual learning environment.

**Development of ICT competences**

The teachers at Politecnico di Milano and from the high schools in the Math Online project all stated that their competences were developed through participating in the projects, and that the support of METID for their daily work had been very useful. The support offered at the Politecnico di Milano had very much been a ‘learning-by-doing’ model.

METID is generally assisting teachers at the Politecnico di Milano in using ICT in their teaching, not through formal courses but mostly through personal dialogue.

**4.5. Outcomes and lessons learned**

**Strengths of the university**

- The vast experience of distance learning due to the decentralised structure of the university and a very well documented and well-implemented didactic framework for using e-learning has given the Politecnico di Milano a uniform way of thinking about and developing e-learning of high quality. This is even incrementally changing traditional teaching on the campus.
- The METID centre seems to be a competent organisation with huge experience and an innovative spirit.
- The leading position of the Politecnico di Milano in the field of engineering, architecture and design offers the university a huge market for e-learning solutions in postgraduate education.
• The project-based experience of partnerships with the public and private sector has given the Politecnico di Milano valuable lessons which can be used as the foundation for creating a consortium.

Weaknesses of the university
• The Laurea OnLine pilot project has shown that the Politecnico di Milano is not accustomed to thinking about e-learning in terms of the market. According to its partner it lacks an understanding of market principles such as customer care.
• The Politecnico di Milano needs to make a strategic decision about the future of e-learning. Will the core element continue to consist of project-based development, or will there be a formalised consortium comprising several partners?
• The absence of any compulsion to use Corsi On-Line for campus-based courses and the lack of a more formal competence development programme for teachers both represent future potential weaknesses if ICT is to be fully integrated.

Main drivers for ICT integration at the Politecnico di Milano
According to Professor Giulio Ballio, there have been three main drivers for the e-learning efforts of the Politecnico di Milano:
1. The geography of the Politecnico di Milano as a physically dispersed university
2. A desire for pedagogical innovation
3. Co-operation with private companies (Somedia and Sfera)

According to the teachers of the Laurea OnLine project the main drivers have been:
1. METID and its competences
2. The individual enthusiasm of teachers

Main obstacles to ICT integration at the Politecnico di Milano
The obstacles to further ICT integration at the Politecnico di Milano seem to be:
1. The absence of a strategic decision on how to move forward in the e-learning area.
2. The non-mandatory use of Corsi On-Line on campus, and the consequent inconsistency of ICT use among the teachers.
Recommendations from Politecnico di Milano to other European universities

The lessons learned from the best practice study at Politecnico di Milano are:

- It is important to outline the pedagogical framework for e-learning, and to aim for high quality e-learning.
- High-quality e-learning can even affect traditional methods of teaching, leading to greater teacher-student interaction and better-structured courses.
- Private and public partnerships can open new doors in the e-learning market.

4.6. Sources and links

Interviewees

- Prof. Giulio Ballio, Rector
- Prof. Albert Corloni, Head of METID
- Prof. Giuliano Noci, Head of MIP
- Daniele Albricci, METID
- Nicola Padovani, METID
- Amanda Zibaldi, METID
- Ignazio Locatelli, METID
- Paolo Marenghi, METID
- Matteo Uggeri, METID
- Prof. Maristella Galeazzi, Math Online
- Prof. Nunzia Tedesco, Math Online
- Prof. Paola Folegati, Laurea OnLine
- Prof. Andrea Maurino, Laurea OnLine
- Prof. A. Campi, Laurea OnLine
- Prof. Robeto Lucchetti, Laurea OnLine
- Prof. Marco Paganini, Master NBA
- Prof. Francesca Concia, Master NBA
- Tiziano Radice, Laurea OnLine
- Paolo Alfisi, Laurea OnLine
- Roberto Mueller, Laurea OnLine
- Alessandro Alcevich, Somedia
- Valerio Eletti, Sfera
- Rita Bramante, Ufficio Scolastico Regionale per la Lombardia
Contact information
Politecnico di Milano
Piazza Leonardo da Vinci 32
I-20133 Milano
Italy
E-mail: web@polimi.it
Web address: http://www.polimi.it/

Strategy
E-learning: il modello Politecnico, 2003

Articles

Examples of projects involving ICT
• Laurea Online – http://www.laureaonline.it/ – degree in Computer Engineering; the first fully-online Italian university degree.
• Corsi On Line 2 – http://corsi.metid.polimi.it/ – system to support face-to-face teaching
• Math OnLine – http://www.mathonline.it/ – mathematics online for high school students
• Master NBA – http://www.masternba.it/ – Master in Net Economy
• Progetto Disabili – a service specially designed to respond to the needs of disabled students and enable them to follow lessons from home.

Other material
• Newsletter 5 – anno 2002/2003: Example of a newsletter to students concerning the Laurea OnLine project
• Laurea OnLine course timetable
• Manuale utente del sistema corsi on-line v. 2.0 – Docenti e tutor (teachers’ guide to online courses)
• Manuale utente del sistema corsi on-line v. 2.0 – Studenti (student guide to online courses)
• Marketing material for Laurea OnLine, SOMEDIA
• Material from http://www.metid.polimi.it/
• Idee e soluzioni per lo sviluppo della conoscenza, Sfera
5. Case profile for Umeå University, Sweden

This case profile comprises the presentation and analysis of the integration of ICT at Umeå University in Sweden. The case study is one of eight which have been carried out as part of a strategic study of virtual models for universities. The eight best practice case studies have the purpose of developing an in-depth understanding of the various models of ICT integration in universities, and also of the trends and perspectives they provide for in relation to future scenarios.

The case profile is based partly on published material concerning Umeå University, and partly on interviews conducted during a site visit to the university in May 2003.

The profile starts out by introducing the university and its ICT, the organisational model of the university, and how and why the university co-operates with other universities public and private partners. After the use of ICT in the educational setting is the case profile ends with an overview of the and lessons can be from Umeå University.

5.1. Presentation and background

Background information concerning Umeå University

Umeå University has five faculties (the Faculty of Arts, the Faculty of Medicine and Odontology, the Faculty of Social Sciences, and the Faculty of Science and Technology, and the Faculty of Teacher Education). In addition there are seven university colleges (hogskoler) connected to the university. The university opened in 1965, and can be regarded as a relative newcomer on the higher education scene. It is characteristic for the university to be interdisciplinary both in its study programmes and in its research.

Umeå University has about 25,000 registered students and a total staff of almost 4,000. The university is situated in the north of Sweden in the city of Umeå, which has a population of about 105,000. The university has a single campus in the city, as well as mini-campuses in other cities in the region. The university has a long tradition of distance education.
The university is very important to both the city and the whole region. Great expectations have been placed on the university as a vehicle for the development of a region which is characterized by great distances and a sparse population. Its geographical location is mentioned in Umeå University’s development programme, which states, “We cannot escape the fact that we are situated on the margins of Eurasia, but our location in cyberspace is something which we will decide” (Utvecklingsprogram 1998-2002, p. 4).

No separate strategy for ICT, but ICT heavily integrated in the development programme

An ICT strategy was formulated in 1995, but has not been revised since then. Instead ICT strategies are an integrated part of the university’s overall strategy which is described in its ‘1998-2002 development programme’ (‘Utvecklingsprogram 1998-2002’). A separate ICT strategy is considered by the rector as being too limited and too quickly outdated.

ICT is an integrated part of the university’s development programme. The development programme envisions that “…at Umeå University teachers and researchers will use ICT in education and research to deepen learning, and to create and maintain relations with individuals, students and researchers in Sweden and the world” (Utvecklingsprogram 1998-2002, p. 5). ICT is integrated into many different parts of the programme:

- **Education**: A goal is for Umeå University to be a leading distance education university. The majority of teachers must be able to use ICT pedagogically in their teaching. The programme emphasises the development of additional courses which are to be offered in a distance-learning format, though the strategy sets no specific targets for this.

- **Research**: Research must take advantage of the opportunities which ICT offers.

- **Students**: Better access to the Internet, e-mail and network services is a priority. More information must be accessible electronically. The information system for students must be improved.

- **Staff**: The internal communication strategy promotes the development of an intranet so as to ensure quick and effective dissemination of information to all employees.
Continuous updating of ICT: There is an emphasis on continuously developing the technological infrastructure and access to ICT, as well as on ensuring training and continuous development in its use.

Common resources supported by ICT: The scope of the technology for improving the quality of administrative work must be harnessed. Continuous development of the infrastructure of ICT, its use and training. Integration of ICT into the university library.

Co-operation with the surrounding community: Further development of the electronic information provided by the university to those outside it is underway.

However, although the development programme was due to be terminating in 2002, it is still being followed. A new plan is though now under development (Spring 2003). The new plan will cover the years 2004-2006 and will contain:

1. Status analysis, also on the integration of ICT.
2. Visions for the future.

The status analysis work is being carried out at the present time. The visions for the future will be based on this analysis. It is anticipated that in the future, the boundaries between campus and distance teaching will be less apparent.

5.2. Organisation, management and business model

Management of university positive towards ICT

The university management is noted by the head of the ICT department as being a driver of ICT integration, as management being is motivated and positive regarding ICT. The vice rector has had previous involvement with distance learning.

The rector of Umeå University sees the role of management concerning ICT integration as follows:

- To be positive and encouraging concerning the use of ICT
• To ensure competent staff are available in central units to support teachers and other staff members
• To give extra resources to ICT projects

**Different units working with ICT integration**

Many different departments and units are working with ICT at Umeå University:

- **IT Office.** The IT Office has overall responsibility for the shared ICT infrastructure at Umeå University. Its role is to develop and co-ordinate the integration of ICT and ICT security at the university.

- **UMDAC** is responsible for the operation of the central ICT system and the provision of hardware and software support to researchers, staff and students. UMDAC also provides support to other universities in the Swedish University Network.

- **Centre for Educational Technology (CUT)** has responsibility for the joint efforts to develop the deployment of ICT in Umeå University’s educational setting. CUT supports teachers and researchers, and initiates and supports research and development of the use of ICT in learning. It also acts as a resource for the university for ICT in learning and competence development in its co-operation and projects involving industry and external organizations.

- **Centre for University Pedagogy (UPC).** This unit is responsible for enhancing the pedagogical development at Umeå University. Here ICT is a related, but minor, aspect of its activities.

- **Other units working at faculty level** and within specialised areas such as HumLab (an IT environment for humanities) and IML (the Interactive Media and Learning Department of the Teacher Education Faculty).

The organisational model for the integration of ICT at Umeå University combines both centralised and decentralised elements. This interplay is considered to be very important. The centralised units maintain the focus on ICT integration, ensure core competencies and support the process of change, but at the same time much emphasis is placed on the involvement of faculties and departments.
Although the development programme has set itself the goal of offering more courses in distance-learning format, the university management has not set out concrete objectives. It is at the faculty and departmental levels that the involvement in distance learning and the use of ICT is decided and implemented. Here the departmental and personal many years of experience with distance learning and the use of ICT are anticipated as being the process drivers.

The rector himself states that when he was appointed he faced the question on whether the integration of ICT would best be supported by a top-down or bottom-up strategy. He ended up with a strategy which incorporated both. The people working within the field consider the organisational model comprising different and specialised units to be a good one, but it is they assess that it may be unclear for teachers whom they should contact with specific questions. This aspect has already been acknowledged, and a goal has been set of generating a better overview of the activities and opportunities available to teachers.

The technological infrastructure at Umeå University is well developed. All the management, academic and administrative staff have access to computers and the Internet at the university, as do the majority of the students. The student-to-computer ratio is 7-10 students per computer. All student rooms are wired to the university computer network and to the internet. All employees and students are assigned a free e-mail address hosted by the university’s own computer centre (UMDAC). Umeå University is linked to all the other universities in Sweden via the Swedish University Computer Network (SUNET).

At Umeå University it is possible to register for all courses and examinations online. Administrative information and information on specific courses is available online to most academic staff and students.

Umeå University does not have an intranet, but one is being developed. The faculties and departments have the responsibility for creating their own web pages. The head of the ICT department is of
the opinion that this has lead to there being great variations in both the quality and extent of ICT use among departments.

The process of selecting a Learning Management System has been a long one. In the end Ping Pong was chosen as a learning platform. At Umeå there is an awareness of the dilemma inherent in choosing an ICT system for a university. On the one hand, a shared system will ease communication and the interchange of information and material. On the other hand, academic freedom is a key value, and the teachers are accustomed to personally selecting or developing the learning resources they use in their teaching. At Umeå University this challenge has been met through compromise. Certain products have been chosen (e.g. Ping Pong as a learning platform), but the teachers still have the option of using other systems. However, central support will only be available for the standard systems.

Technological development is at Umeå University assessed as a very important driver for the integration of ICT at Umeå University.

**ICT is mainly funded through the regular university budget**

The ICT implementation and integration at Umeå University is funded mainly through the regular university budget. However, it is difficult to know how much is actually spent on ICT at the university. The different units with responsibilities for ICT are allocated lump sums from the budget to develop and maintain the infrastructure and other shared facilities, but the faculties and departments pay separately for the services they use, e.g. for the training they offer their staff. The advantage of this model is that not only does it enable the management to demonstrate its commitment to ICT, but according to the head of the ICT department it also ensures dialogue concerning the availability and prioritising of resources when the departments make use of the ICT units’ services.

In addition to receiving funding from the university itself, the ICT integration is to some extent funded through:

- Direct government funding
- Project funding
- Private sponsorships
• EU programme funding
• Public/private partnerships

For example, extra funding from the municipality and the EU often supports courses tailored to the specific needs of a municipality, or the departments working with ICT will receive external funding when they are involved in development projects such as SUNET and LADOK.

Limited financial resources are regarded as a substantial obstacle for the expanded use of ICT at Umeå University.

5.3. Co-operation with other universities, municipalities and private companies

Strong focus on co-operation

At Umeå University there is a strong focus on co-operating with other entities. The university co-operates with many universities on a project basis and has well developed co-operation with both the public and the private sectors.

Co-operation with national and international universities on a project basis

Umeå University co-operates in consortia and on a project basis with both Swedish and international universities, but it is not co-operating with any on a permanent basis, nor has it entered into partnerships with any universities.

One example is the co-operation between Umeå University and the universities located in the Kvarken region. There is a long tradition of co-operation in the region, but travelling and maintaining contact via the ferry connection has been problematic. The use of ICT for communication and co-operation now makes it easier. Technology is seen as a driver of the co-operation, together with the involvement of ICT enthusiasts. A barrier for co-operation in the region is the comparability of studies across national borders (the Kvarken region covers both Sweden, Finland, and Norway). Another example of co-operation is the Centre for Educational Technology, which is involved in collaborative projects with the University of Stockholm, the University of Oslo and the Åbo Academy.
The rector sees an inherent dilemma in the issue of co-operation. On the one hand, ICT makes it easier for the universities to cooperate, and the university management is focused on extending co-operation with other universities in the fields of research, teaching and the development of learning resources. On the other hand, greater competition among the universities is also anticipated, and the integration of ICT is viewed as a means of positioning and differentiating the university.

In this assessment of the co-operation which exists it is evident that there is a general interest in co-operating with other universities, but the interviewees point toward different elements which limit it.

- There are often problems with the distribution of power, funding and work in co-operative projects. It is important to agree on the structure of the co-operation being undertaken. This necessity for a clear division of labour has been emphasised by a representative from another university with which Umeå University is co-operating.
- The goals of the co-operation must be clear. Although there are already healthy relations with some universities, this should not limit co-operation with other universities. It is important to be aware of the value of the co-operation for both partners to benefit from it.
- Finally, the growing competition between universities represents a brake on the motivation to co-operate.

**Mobility of students**

In Sweden students are willing to move physically to study at Umeå University. 40% of all its students come from outside the Norrland region. Umeå University is one of the top two universities in Sweden in terms of its national recruitment.

Virtual mobility is only supported at a project basis at Umeå University. For example has Umeå University co-operated with a university in Slovenia in the development and holding a course. Students from both universities participated in the course, but they only met in a virtual environment.
In Sweden a so-called ‘Third Task’ is being assigned to the universities, involving continuous dialogue and co-operation with the communities in which they are located. Umeå University is striving to maintain close contact with the region in which it is situated, in addition to focusing on its activities as an internationally competitive university.

Two units at the university are dedicated to maintaining contact with companies, external organisations, the government and the local authorities:

- **Uminova Centre AB** works to instigate and maintain all forms of contact with business and industry in order to promote and conduct co-operative development projects. The organisation’s activities comprise business and project development, as well as work performed by researchers and students for public and private partners.

- **UnivEx** is an educational service which offers tailor-made courses and know-how development projects. The courses are designed to be an element in the strategic development plans of companies, schools and organisations, and are designed so that their graduates will be well suited to the needs of local industry. UnivEx staff also work as advisors for the local study centres on the purchase of equipment and the operation of the centres.

These two units will be combined during the summer of 2003. Around 50 people will be working in the new unit.

Adding to this is CUT the expert unit at the university responsible for contact and co-operation with public and private partners on the area of ICT in the educational setting and competence development.

The co-operation between Umeå University and the whole region is of key importance. There is a close connection between the university and the development of the region which involves co-operation between the university and the municipalities. According to a study undertaken by the Centre for Regional Science (CE-
RUM) at least 25 per cent of the growth of employment in Umeå can be ascribed to the university.

Umeå University co-operates with public partners on a project basis. Municipalities often require studies to be undertaken in their own district, and the university develops and offers courses targeted on the needs of the local industry and population. This is done through close contact with the municipality and local industry. The municipality financially supports the development of the courses, which may then be offered in distance-learning format either at local study centres or via the internet.

Students emphasise the importance of courses being developed which support the needs of the rural areas and their local industry, as well as close co-operation between the university and the municipalities. The greater availability of distance learning may limit the depopulation of the rural areas.

Co-operation with private partners

Umeå University co-operates with private partners and has a centre – the Uminova Centre AB – whose specific task is to strengthen the contacts between industry and the university. However, Umeå University is facing a dilemma. It wants to open itself up and offer the knowledge created at the university to society, yet by doing so the university would risk losing its students and researchers to private companies, since its research and ideas could be commercialised. This challenge is being met by Umeå University in two different ways.

One way is to support the promotion of innovative ideas developed at Umeå University as new business concepts and products. Through a holding company (Uminova Holding AB), the Uminova Centre owns Uminova Företagsutveckling AB (the Uminova Enterprise Development Company). Uminova Företagsutveckling AB is a minority investor in the companies emerging from the research environment at Umeå University. This is seen as ‘grafts taken from the university’.
Another way is to support co-operation between university research and private companies. In this way the university does not lose its researchers, while good ideas are continuously generated for commercialisation. One example is the co-operation between the VR lab at Umeå University and the private company Oryx Simulations. Oryx is collaborating with the research department at the university and commercialising the research results. For example, Oryx Simulations has developed a forestry machinery simulator whose origins lie in research conducted at the UOC. For the co-operation between a university and a private company to be both feasible and attractive, the CEO of Oryx points to the importance of the research being the world’s best, otherwise it has little value. In an assessment of the co-operation between Umeå University and Oryx, the CEO points to two factors which have been important: 1) Their co-operation is built on trust. Money does not pass between the university and Oryx. 2) The co-operation must be professionally valuable to both partners.

Several partners which co-operate with Umeå University underline that co-operation with a university makes particular demands on the enterprises. The Oryx company states that its co-operation with the university is based on a long-term strategy which will take time to bear fruit. Teknikhuset, a local ICT company which has not been co-operating with the university for long, notes that it is finding it difficult to reach the right people at the University, and it would like an easier way in. The companies also have an interest in co-operating with students on special assignments. Umeå University has to some extent been meeting these demands. The university’s strategy for external information emphasises the development of more information in electronic format and a database has been developed which matches the interests of students and companies with regard to individual assignments.

A network has been developed which includes regional actors within the field of ICT and learning. It involves the university, local companies, and the municipality. Previously, the many and different competencies and actors in the fields of ICT and learning were not visible to one another. Through the network the different actors...
have come to know one another’s strengths and to see the possible opportunities in each other. Because Umeå University has been acknowledged as a leader in the field of e-learning it has for example been offered to develop e-learning on a commercial level, but as production is not a core activity of the university, the university is through the network able to suggest local companies instead. The network is though still in an early phase.

More co-operation and partnerships are expected in the future. The network and other good experiences with co-operating are seen as a good starting-point for this. However, the Umeå municipality’s Head of Economic Development and Promotion Office, calls on industry to become more active.

Extended EU and national co-operation is necessary

It is at Umeå University assessed that extended EU and national co-operation are to a high extent necessary for:
- Further implementation of ECTS
- Development of a quality assurance model
- Support of co-operation between universities and other educational partners
- Support and funding of pilot and development projects

5.4. The educational setting

The number of students at Umeå University has doubled between 1990 and today. In 2003 there is 25,000 students at Umeå University. Historically the universities had been exclusive, but after the 1960s more and more students entered the universities. The rector of Umeå University anticipates that this trend will be even stronger in the future. Lifelong learning and more module-based courses will be important features in this development, and ICT will be an important tool for supporting the many new students.

Umeå University offers both campus-based and distance learning courses. 28% of all students study at distance courses, equivalent to 11% of the 2000 full-time courses. According to Umeå University’s own figures, it offers more distance learning courses than any
other institution in Sweden. Below, the integration of ICT on campus will be described first, then the different types of distance teaching.

**Use of ICT at campus**

The integration of ICT in courses is at Umeå University assessed to have increased significantly in the past two years.

Both teachers and management call attention to how the experience derived from distance learning has influenced the use of ICT at campus. The Ping Pong system was originally developed for distance teaching, but is now also being integrated into campus-based teaching.

The head of the ICT department points to the easy access to ICT across the entire campus as being an important driver for ICT integration. Wireless networking is currently being rolled out all over the campus. Although there are some security problems connected with wireless networking, it was decided to go ahead with the roll-out anyway in order to try it out and get some experience with it.

**Two types of distance courses**

Umeå University has been working with distance education since it was founded in 1965. Both basic degrees and continuous education are being offered in a distance-learning format. It is interesting to note one department’s experience that the demand for its distance courses has grown more rapidly during the last couple of years than for its campus-based courses.

Distance education supports regional development, social inclusion and lifelong learning. With distance courses it is possible to reach the less populated areas of the north of Sweden, and the opportunity for limiting the depopulation of the rural areas is emphasised. Most of the students interviewed who studied at a distance pointed out that they would not have been able to study if the course had not been available in a distance-learning format. Therefore the students are highly motivated in favour of distance courses. The students who take them are different from the students on the campus. On average they are ten years older than the campus students, and about 70% of them are women.
The 1998-2002 development programme states that more courses should be offered in a distance-learning format, but it sets no specific targets. The decentralised model leaves it up to the faculties and departments to decide which courses they want to offer as distance learning. On the one hand this supports the promotion of distance learning when it is relevant and when there are motivated staff pushing it, but on the other hand it can result in a reduced and more haphazard availability of course offerings.

Umeå University has a diverse set of distance courses, which they categorize in two groups:

- **Decentralized teaching.** The courses are held at study centres in the region
- **Net studies.** These courses that are taken via the internet.
  There may be none or only a few meetings with face-to-face interaction.

### Decentralized teaching

In decentralized teaching the students do not have to come to Umeå University, but instead they meet at the study centres situated in the region. The decentralised courses integrate ICT.

Umeå University is dedicated to providing higher education opportunities to the people living in its region. Mini-campuses have been set up in the nearby towns of Örnsköldsvik, Skellefteå and Kiruna, but the university also runs courses in study centres in more than 50 municipalities. On the three mini-campuses the university has its own personnel. Elsewhere, the study centres are owned and run by the local councils. These study centres are very important. They are technically well equipped, as well as offering a good environment for studying. It is the experience of the teachers that students who have any way of getting to the study centres do so, instead of just studying from home.

One example of a decentralised study is the new course in pharmaceutical dispensing (Receptaria). This study will be offered as a distance-learning course from Autumn 2003. During the course the students will meet 2 to 3 times every semester in Umeå for work in the laboratory; otherwise they will meet at the study centres, where
local counsellors and trained pharmacists will guide them.

On decentralised courses the students meet at other locations than Umeå University. A student on a decentralised course noted that there were more meetings at the study centre than he had expected. Courses without face-to-face meetings are also offered at Umeå University, however (see below).

**Net studies**

Net studies are courses that taken via the internet with none or only few meetings with face-to-face interaction. In netstudies there may be a few meetings to for example at start-up or at the end of the course, to carry through laboratory work, at excursions or for the examinations.

About 100 courses offered at Umeå University are fully virtual (5%). Umeå University offers several of its courses through the national Swedish Net University.

**Learning model for distance teaching**

Problem-based learning is the pedagogical model used both for many campus-based courses and for distance learning.

In distance courses, problem-based learning is emphasized as being essential in ensuring reflection and involvement. Distance courses can easily end up simply as vehicles for sharing information and learning facts, but the teachers at Umeå University are determined to ensure that the activities of learning must also include the learning of skills for solving problems, taking action and being ethically aware. These aspects can be supported by problem-based learning.

Both teachers and students emphasise the importance of direct personal contact in distance learning. Contact can be via mail, discussion fora on the Internet, classes and meetings at study centres, study groups, or personal contact with counsellors at the study centres or when the students are doing practical training.

The students have observed the enthusiasm of the teachers in their distance courses. They also stress that the teachers answer
questions from students quickly, and are very good at helping them. But while many digital channels are available for communication the students still say that they miss having direct personal contact, and stress the importance of their meetings. They also emphasize the importance of the teachers actually coming to the study centres.

There is great variation among the courses offered at the different faculties and institutions at Umeå University, as no standard model of e-learning has been developed. It is the responsibility and decision of the teachers as to how to organise their teaching. This is consistent with academic freedom, but it also makes the impact of the distance courses on the students unpredictable. In addition, there are no defined standards for the quality of e-learning courses. The rector believes that it is not possible to develop such a system centrally; quality is assured locally in accordance with the ideals of academic freedom. However, some students are sceptical about the great differences they have noticed between courses.

**Technology**

Different types of technology are being used in the teaching at Umeå University:

- Ping Pong and First Class – virtual learning environments on the webb
- Maratec – net based meetings using miniature digital cameras
- Videoconference, both ISDN and IP
- E-mails and electronic conferences
- Telephone and Teleconference
- Videostreaming.

Ping Pong is the virtual learning environment chosen by Umeå University in which information and communication is merged into a single Internet-based system. The platform is used for both campus-based courses, decentralised courses and net courses. Ping Pong is continuously being developed by Ping Pong AB. Several universities are participating in a user group (Ping Pong academic group) that influences the development of the system with their ideas and comments based on experiences from use. The students are divided in their assessment of Ping Pong. Some young stu-
Students find it easy to use, but some of the older students interviewed found it hard to learn. The students interviewed complained about technical problems that had to be solved. Though ICT has been used in distance learning at Umeå University for many years, the students still complain about technological ‘teething problems’ (start up problems). This may be due to the continuous development of new versions.

The courses combine the different strands of technology. In for example a nursing course, all students are equipped with a laptop computer with a webcam. In the virtual learning environment course, Ping Pong is being used together with the Maratec system for Netbased meetings. The technologies are used to maintain contact remotely, but the students also meet in person at the study centres.

The importance of access to broadband connections is becoming increasingly evident as the different information and communications technologies develop. Students stress the importance of having access to broadband, as well as the responsibility of the municipality in developing the regional infrastructure in order to ensure that they can benefit adequately from what is available from Umeå University.

Teachers develop their own learning resources

The teachers of Umeå University often develop their own learning resources. Normally they do not use resources developed by others. The teachers interviewed justify this on the grounds that they are the experts concerning their own courses, as well as on their academic freedom-based right to decide which learning resources to use, or else to develop their own.

There are great variations between the learning materials developed at Umeå University. A cheap solution consisting of guidance on a web page has yielded good results, but so have also advanced simulations. In the development of the nursing distance course the teachers themselves undertook the development of the learning resources at low cost, whereas extra funding is being made available to develop the learning resources for the new
pharmaceutical dispensing course which is currently being put together. All teachers on the course are being offered a two-day course in problem-based learning and how to support it at a distance, as well as the teachers working on making the pedagogical ideas and technology support one another.

**Development of ICT competences**

The issue of competence development is the responsibility of the faculties and departments. The faculties and departments prioritise the investment in time and money for the use of ICT in their courses in accordance with their own needs and experiences.

Insufficient knowledge of ICT among teachers is seen as a considerable barrier for the expanded use of ICT at Umeå University. The teachers reveal that they normally learn to use ICT by themselves or with the help of colleagues, but courses for developing ICT competences are also available. Different departments and units (CUT, UPC, HumLab etc.) offer courses and other services relating to the pedagogical and didactic aspects of using ICT in teaching, including distance teaching. Though the division of competences between the units is clear to those working with ICT, the fear is that it may not be as clear to everyone. It is by the staff working with ICT acknowledged that it may be difficult to obtain an overview of all the courses and services being offered, and therefore a new web page is under development where all the available courses and services will be brought together.

The development of students' ICT competencies is the faculties' responsibility. The general model is that teachers instruct the students in using ICT. The distance education students express their need for better training in the use of software used and communication technology. The students interviewed had all had some training at the beginning of the course, but they felt a need for more of it. The students consider that it is important to have some knowledge of ICT before undertaking a distance course.
Who is driving the integration of ICT in the educational setting?

The staff are a university’s most important resource. The existence of ICT enthusiasts plus the experience gained through projects are the factors which most interviewees point to as being of key importance for the integration of ICT. Some staff members still consider that the integration of ICT is based on the activities of enthusiasts, but most of those interviewed regard ICT as now being operational, meaning that it has been integrated into daily life and is not simply dependent on enthusiastic individuals and special projects. The rector notes that he no longer hears discussions about whether ICT should be integrated, but how. ICT is already being widely used, but the next goal is to get all teachers and staff members working with it.

Management and students are assessed as often being more interested in the implementation of ICT and e-learning than the academic staff. According to the management a lot of students are in advance of the teachers regarding their interest in the use of ICT. The head of the ICT department regards many teachers as enthusiasts, but in general the teachers are not seen as drivers of the ICT integration process. Insufficient knowledge of ICT among teachers is seen as a barrier to the expanded use of ICT at Umeå University. However, it is expected that experience will be the driver for integrating ICT. No special incentives at have been introduced at the university to encourage the teachers to implement ICT in their teaching (but at national level extra funding is offered to courses offered as e-learning). Instead it is anticipated that the teachers will inspire and help one another to start using ICT, set up projects to integrate it into their teaching, and as well offer distance education.

The integration of ICT presents teachers with new challenges. Teaching at a university is a very free and individualistic occupation fed by personal enthusiasm. The many new demands are putting pressure on the teachers. One staff member interviewed cited a statistic indicating that sickness was beginning to increase among university teachers. It is important that they should be supported in integrating ICT into their work.
5.5. Outcomes and lessons learned

**Strengths of the university**
- The university has a long history of offering courses at a distance, which has given the organisation much experience in this field. ICT is no longer project-based, but is part of the standard operation of the university.
- The technological infrastructure at Umeå University and in the city of Umeå is well developed.
- The organisational model for the integration of ICT at Umeå University combines both centralised and decentralised actors. This enables the existence of central units offering professional support while also leaving room for local initiatives which ensure local grounding and involvement.
- The faculties and departments are free to choose which courses to offer at a distance, and how to run them. This permits distance learning to be offered when it is relevant and there are motivated staff to support it.
- A network of regional actors within the field of ICT and learning has been developed. This is supporting the development of key competences in the region.

**Weaknesses of the university**
- There are no special incentives at university level for the integration of ICT or for the teachers to engage in e-learning, but at national level extra funding is offered to courses offered as e-learning.
- Great variations exist in the use of ICT across different departments and courses as a result of their dependence on local initiatives. No standards are set on how to offer distance courses, resulting in unpredictable course quality.

**Main drivers of ICT integration at Umeå University**
- Enthusiasm and experience through projects are the factors that most interviewees highlight as being of key importance for the integration of ICT.
- The many years of experience with distance learning has a positive influence on the use of ICT on the campus.
- Students are seen as an important driver for ICT development.
- Management is involved and positive towards ICT, a factor which supports the implementation of ICT and e-learning.
Technological development is assessed as being a very important driver for the integration of ICT at Umeå University.

Distance courses have been developed through dialogue with municipalities and local industry. Many students would not be studying if distance education was not available. Students are well-motivated.

Main obstacles to ICT integration at Umeå University

- Limited financial resources are seen as a barrier for the expanded use of ICT at Umeå University to a very high extent.
- Lack of high-quality ICT-based teaching material is viewed as a significant barrier.
- Academic staff are not drivers for the integration of ICT. Prevailing culture, workload, and time constraints that reduces the willingness to change, are key here. Insufficient knowledge of ICT among teachers is also an important barrier.
- The Swedish system is based on modules, and courses are offered only once per semester. This is a barrier to the desired student flexibility.

Preconditions of success

- The university has a long history of offering distance courses. Its experience of distance education gives it a good foundation for the integration of ICT, as an interest in ICT is well established here.
- Necessity. Umeå is a region in the far north where the population is scattered across a large area. This has made distance teaching and the use of ICT essential.
5.6. Sources and links

Interviewees

- Inge-Bert Täljedal, Rector
- Gunnel Gustavsson, Vice-rector
- Torbjörn Wiberg, Head of the IT department
- Jerry Ando, Head of Centre for Educational Technology
- Ali Foroutan-Rad, LADOK (a computer-based student admission and documentation system for a university or university college)
- Ingemar Ericson, Head of the Planning Office and Planning Director
- Hans-Olof Forsberg, UnivEx
- Peter Bergström, Lecturer from the Department of Interactive Media in Learning
- Siv Boman, Head of the Department of Science and Technology at the University Library
- Sven B. Eriksson, Head of the Centre for University Pedagogics
- Helen Hed, Librarian at the Department of Science and Technology at the University Library
- Patrick Svensson, Director Humlab
- Martin Burman, Senior lecturer with responsibility for the faculty of Science and Technologies’ contacts with industry and the community
- Madelen Holmlund, ICT educationalist at CUT
- PO Sandman, Professor at the Department of Nursing
- Gösta Bucht, Professor at the Department of Community Medicine and Rehabilitation
- Christina Lundström Lövgren
- Linda Granberg
- Ola Bovin
- Karin Magnusson
- Sara Lorkowski
- Cora Karlsson
- Roland Carlsson, Head of Economic Development and Promotion Office, Municipality of Umeå
- Derny Häggström, CEO, Oryx Simulations AB
- Dan Nilsson, CEO, Teknikhuset AB
- Niklas Åström, Developer, Teknikhuset AB
- PO Söderström, Senior Consultant, Norrlands University Hospital
- Johanna Backman, Project leader, Kvarkenrådet

Contact information to Umeå University
- Umeå University
  SE-901 87 Umeå
  E-mail: umea.universitet@adm.umu.se

Umeå University website
- Umeå University website: http://www.umu.se

Strategy papers
- The 1995 ICT strategy [in Swedish]:
  http://www.umu.se/it/dok/Itstrat95/Itstr95.html
  http://www.umu.se/umu/policy/utveckl_program.pdf
- 2004-2006 Development Programme (all related documents) [in Swedish]:
  http://www.umu.se/umu/utvecklingsprogram_2006/dokumentarkiv/index.html

Competence development programme
- Courses offered at Umeå University on information and communications technologies:
  http://www.cut.umu.se/proj_akt/IKTUM/index.html

Examples of projects involving ICT
- Athena – a research programme about net-based learning:
  http://www.cut.umu.se/athena.htm
- Athena – Skills acquisition lab:
  http://www.cut.umu.se/athena_sal/
- UniZon. University co-operation in the Kvarken region:
  http://www.kvarken.org/unizon/news.asp
• UniNet (United Network for Educational Technology). Integrated into the UniZon network:
• Project concerning internet-based examinations:
  http://www.cut.umu.se/proj_akt/ibe/index.htm
• Project concerning the development of the pharmaceutical dispensing course: http://www.cut.umu.se/RUT/
• VR lab project: Virtual Mouth:
  http://www.vrlab.umu.se/forskning/munhalan_eng.shtml
• Project at the Department for Interactive Media and learning:
  http://www.iml.umu.se/forskning/forskningsprojekt.html
• The IKTUS project: – http://www.cut.umu.se/proj_akt/iktus.htm

Technology
• e-Meetings at Umeå University: – http://www.emeeting.umu.se/
• Ping Pong: http://pingpong.umu.se/allm_info_pingpong.htm
6. Case profile for Utrecht University, The Netherlands

This case profile comprises a presentation and analysis of the integration of ICT at Utrecht University in the Netherlands. The case study is one of eight carried out as part of a strategic study of virtual models for universities. The eight best practice case studies have the purpose of enabling an in-depth understanding of the various models of ICT integration in universities, and also of the trends and perspectives they provide in relation to future scenarios. Additionally, the case studies are intended to publicise the experiences and lessons learned from those institutions or partnerships which are well advanced in their integration of ICT in university education.

The case profile is based on written material concerning Utrecht University and on interviews carried out during a site visit to Utrecht in May 2003.

The profile starts out by introducing Utrecht University and its background. Subsequently the profile focuses on the partnership model and the educational model. The overall strengths and weaknesses and the preconditions for success are presented next. Finally, the various sources used in compiling the profile are listed.

6.1. Presentation and background

With about 23,000 students and a total staff of more than 7,000, Utrecht University is the largest research university in the Netherlands. It comprises 14 faculties (Arts, Biology, Chemistry, Earth Sciences, Geographical Sciences, Law, Mathematics and Computer Sciences, Medicine, Pharmaceutical Sciences, Philosophy, Physics and Astronomy, Social Sciences, Theology, Veterinary sciences). The university offers 45 bachelor degrees and 180 masters programmes. Research is conducted in 50 research schools.

The University dates back to the 17th century and stands on three locations or campuses in and around the city of Utrecht, which is the fourth-largest city in the Netherlands (population 250,000).

The university’s annual turnover is 583 million Euro. The percentage of public financing is 68%.
The University of Utrecht introduced the bachelor/masters structure in 2002.

**Who is involved in ICT development and integration?**

The central ICT policy is developed and co-ordinated at the University Services office, where the Chief Information Officer, Mr. P.J. Schelleman, is responsible for the overall administration of ICT policies.

The technological infrastructure is provided at central university level, which is responsible for initiating and running projects such as Osiris On-line, an on-line registration and administration tool. The central level also offers various services to the faculties and institutes which they purchase according to their needs and strategies. The aim of the central level is to support and promote ICT development, but the university has a decentralised structure, and the faculties and institutes are individually responsible for their own ICT development.

The development of ICT in the educational setting is driven by the Centre for ICT in Education at the IVLOS department (the department for Teacher Training).

The Centre for ICT in Education works with all faculties and units at the universities, as well as participating in various co-operation ventures and projects with other Dutch universities, overseas universities, the SURF Foundation and other partners. The Centre focuses on developing pedagogies and models for using ICT in education, mainly within the University of Utrecht (UU). The Centre has four overall tasks:

- **Supporting** all levels of the UU in its use of ICT in education. This includes digital learning environments and the support and professional development of teachers. The institutes and faculties pay for using the Centre’s services. In addition, the Centre leads and initiates various projects concerning ICT in education. These are selected by a commission which decides how the money it receives from the Board is to be spent. The Centre is also involved with projects funded externally by SURF or the EU.
• **Knowledge exchange** with other universities and partners. Every second month the ICT co-ordinators from various universities meet up and exchange information and experiences.

• **Professional development of the UU teachers.** The Centre offers various services and projects for teacher training and professional development which the faculties and services can buy. Because of the introduction of the bachelor/masters programme, all faculties and teachers are extremely busy adjusting their course programmes. Therefore there is currently a limited demand for ICT development projects.

• **Knowledge development and research.** Finally, the Centre is supposed to engage in research and knowledge development. This combination of research with teacher training makes the Centre quite unique in the Netherlands.

The Computer Centre has been outsourced to Cap Gemini Ernst and Young since 1999. This model will be described in more detail below.

**Relationship to SURF Foundation**

The University of Utrecht is a full member of the SURF Foundation. The university is involved in various SURF projects and sees SURF as valuable for developing its ICT.

It is the general impression that SURF has provided good results. It is important to co-ordinate and support interactions between systems at a national level as well as at EU level.

SURF runs a website where examples of good practice are available and which presents examples of how to use ICT in education, such as how to use test materials in one’s courses.
6.2. General approach, organisation and technological infrastructure

General approach and ICT-strategy

The University of University has a strategic plan for the development and use of ICT during 2000-2004. The strategic plan focuses on the following:

- Extended use of ICT in teaching
- Development of infrastructure up to international standards
- On-line scientific and library services available from anywhere
- On-line communication available 24 hours a day, 7 days a week
- Effective administration and use of e-business
- Total costs of systems should be transparent; internal pricing policy used strategically.

The general approach of the University of Utrecht is that its ICT development should be a combined bottom-up and top-down process. The role of the central management is to support and facilitate faculty-level ICT integration but not to force it. The central level has to motivate the faculties to move forward by demonstrating the advantages of doing so, by providing good services, and by assisting the faculties and institutes in every way it can.

Up until now the approach has been even more decentralised, but currently there has been a shift towards centralisation in order to introduce a more strategic and co-ordinated approach. This is needed to push the development of ICT onwards, and to maximize efficiency in using the considerable resources consumed at the university.

As an example, when one department develops a need for a particular solution, the central level investigates how this can be integrated into the overall system and how the other departments could benefit from it. The central level then offers this service to them too so that they can split the costs between them.

The central level also collects data and analyses the extent to which ICT is being used in the various faculties.
There will always be front-runners among faculties and teachers, and this is also true at Utrecht University. The innovators and front-runners should naturally be supported, but the main emphasis is to try to encourage the intermediate group of faculties and teachers, as they are the key factors in trying to spread and establish the development of ICT.

Management involvement in ICT

The university board is relatively heavily involved in ICT development, as it considers a co-ordinated and focused approach to be important.

At the operational management level they see one of their main tasks as balancing the top-down and bottom-up approaches. Because of the autonomous nature of the faculties, the value of academic freedom and the university’s decentralised tradition, the university management is cautious about pushing too hard for development and alignment.

As a way of managing the development of ICT, the management has laid down criteria for the departmental funding of ICT development:

- External evaluation
- Demonstration of value
- Substantial programme and a comprehensive strategy
- Close contact with the IT expertise centre

The funding covers the necessary infrastructure and software. The faculties have to pay for the staff themselves. The idea is that if they believe in the project and are committed to it, they should be able to supply some of the funding themselves.

Assessment of the status of ICT integration

The interviewees find it very hard to assess the overall status of ICT development. The huge differences among the individual faculties, institutes, teachers and students make it very hard to paint a general picture.

They consider that they are advanced and innovative in some regards, but they also acknowledge that the development of ICT
could follow several different paths, and that there are great challenges ahead in trying to take the university forward in its entirety.

The fact that Utrecht University combines research with consultancy in the Centre for ICT in Education, for instance, is seen as representing a great advantage and a useful innovative combination.

**Funding**

The funding of ICT development comes from various sources. In general it is funded from the university budget and approved by the board. The board distributes the funding, and the management decides which projects should be supported.

The university faculties have their own budgets. The faculties decide which services to provide to their students.

The government funds the development of the basic technological infrastructure.

Finally, the university finances some projects via SURF and EU international funding.

**Online registration – Osiris Online**

The University has developed an on-line administration and registration system, Osiris On-line. The system was developed by a small company, but the University of Utrecht owns the system. They now sell it commercially to other universities.

The aspiration is to transfer all administration information and activity to the Osiris system. Currently the system is used for enrolment, course planning, the notification of exam results and the delivery of information to students and teachers. The majority of the students use the system, but it is still possible for students who do not wish to do so or who do not have the facilities to use the on-line system to register in person. In addition, the system is linked to the Blackboard and WebCT digital learning platforms.
A digital signature system is under development and should be implemented in the near future, which will result in even more services becoming available.

The system is monitored in order to see how the students use the system and how it can be improved.

The general assessment is that the students like the system. When it was first introduced there was a short adjustment phase. However, very soon they realised its great advantages in terms of speed and accessibility. The only complaints currently being received are due to technical problems with the students’ hardware or software. In addition, there have been discussions concerning the deadlines for registration or the delivery of papers or exams. There have been incidents where the students could not deliver material or register before a deadline due to technical problems.

The University of Utrecht is currently running two learning platforms; Blackboard and WebCT, managed by two separate consortia within the university. The academic institutes decide for themselves which platform they want to use. The platforms are hosted at central university level.

The reason for the Board’s decision to go with two consortia was that the development of ICT using the electronic learning environments started at a decentralised level in the faculties. The Board wanted to co-ordinate the use of the platforms and therefore encouraged the development of the consortia so that they could manage and co-ordinate the use of the platforms at faculty level. Before the establishment of the consortia each faculty had its own license, server and technical support. These efforts had to be co-ordinated so that joint licenses could be purchased.

However, the Board did not want to force the faculties to adopt a single platform. This was partly due to the fact that the market for e-learning platforms is still quite immature, and so it is hard to estimate the progression of future developments. Having two platforms gave the university the opportunity to follow the development
effort and postpone the decision on which platform to select for a wide-scale implementation.

The two platforms are managed by two consortia in which the participating faculties are represented. The consortia work together and exchange experiences, but they also compete with each other.

There are many similarities between the two consortia. The participants select a neutral co-ordinator and server host, and then agree on the service level. The partners must delegate decision-making power to the co-ordinator so that not all parties have to be included in every decision. The interviewees see great advantages in going forward jointly as consortia instead of individual faculties or institutes.

However, it does mean that the participants must settle on suitable service level agreements, something which is currently being discussed.

The two platforms are introduced to the teachers of the faculties in an introductory meeting. The introduction procedures are currently being refined. The general attitude of the teachers is positive, and the interviewees estimate that circa 80% of the teachers are using the platforms. However, there are great differences in the extent of their use.

According to the interviewees, there are two main problems with the fact that the university is using two different electronic learning platforms:

- When students move from one faculty to another or combine courses from several faculties they are forced to switch between platforms. The technical issues have been solved, but from a teacher’s or user’s point of view it is very confusing.
- It doubles the cost of providing support.
- It undermines the focused development of teacher competences.

However, it is generally considered that the advantages outweigh the problems in the Utrecht situation.
The development of the library services is essential for the University of Utrecht’s ICT strategy.

The role of the university’s library services is changing rapidly through the use of ICT as the boundaries between library services, teaching and research blur. As a consequence it is a key challenge for the university to transform the library services and integrate them into the teaching and research settings.

The role of the library is changing from buying information and physically storing it in the library building to buying access to information. The aim of the library is to provide everybody with access to all kinds of information. The new role of the library is therefore to provide access to this information to all students and staff, and to train them into becoming their own librarians who will access and store the information which is relevant to them individually. Hence the organisation of the library is being transformed into a more customer-oriented entity. Currently the library is working on a project whereby the library instructions are totally integrated into the teaching process as part of the programme. This development needs to be taken further, and the library staff needs to become even more involved in the actual education process.

At present the library service is split into central university services and faculty services. The faculty libraries serve the individual faculties. This is changing as the university moves towards a more centralised library in which the electronic storage of material and information is centrally co-ordinated. The aim is to provide universal access to information for all.

At the moment there is a considerable tendency towards fewer researchers and teachers using the central physical facilities, and hence the role and the organisation of the library ought to change according to the evolving needs of its users. This is done by establishing student and research landscapes at the institutes in which library services are integrated with education and research. Access to information has to be available where it is needed.
Accordingly, there is a simultaneous trend towards both centralisation and decentralisation.

The library has itself pushed strongly for this change in order to redefine and develop its role in step with the development of ICT. The process of getting the teachers and researchers to realise that the library is changing and to acknowledge the new role of the library and electronic services does take some time. One of the drivers in this development is the international outlook of the library, which supplies input concerning the state of the art in the rest of the world.

According to the interviewees the main obstacles to this development are:

- Publishers are opposed to change in this area and are afraid that it will lead to diminishing markets. As a consequence, they are not being very positive towards the attempts to develop more modern approaches to issues concerning licenses, copyright and intellectual property rights. There is a great need to develop new payment mechanisms and systems of licence administration.
- Many people are resistant to change. The may say they are innovative, but in fact they do not want rapid change because they are fearful of it.
- A lot of people are afraid that the electronic versions of their material will not be safe enough from loss or destruction, and they are therefore afraid to switch their procedures from a physical to a virtual setting.

6.3. Co-operation, partnerships and the business model

Outsourcing of the IT centre
In 1999 the university decided to enter into a strategic outsourcing partnership with Cap Gemini Ernst and Young. They outsourced the university computing centre (ACCU) consisting of 120 staff members for approximately 8 million Euro. The employees were all offered work with Cap Gemini Ernst and Young.
The main reason for the outsourcing deal was the wish to improve E-services to all of the students of the university without spending more money. Some serious problems had been experienced while the university was running the IT centre. The Centre had been re-organised three times but was still failing to function properly. It was too costly and was losing income from contracts, which were being lost to other actors, and yet there were no drivers within the university capable of organising the Centre differently. In addition, the service level was not up to scratch and the customer orientation was poor. As a consequence the faculties were consolidating their own computing centres and there was an urgent need for things to change.

An additional motive was that the university did not want to pay for the development cost of establishing a new computing centre. Instead they saw an opportunity to capitalise on the experience of a large IT company capable of providing industrial-strength software.

According to the management, IT was turning into a commodity which could be bought and sold in a similar way to legal services, office cleaning and the running of the canteen. In addition, this part of the university’s IT services was not seen as central to its academic core, and therefore there were no strategic problems with outsourcing this aspect of the university’s activities.

Cap Gemini Ernst and Young’s motivation for the outsourcing deal
The deal came into being because Cap Gemini Ernst and Young had approached the university with a smaller proposal and the outsourcing idea then came up. The contract was not subject to an open tender procedure because that would have taken too long, and would also have resulted in a substantial loss of staff due to the uncertainty of the open tender process.

Cap Gemini Ernst and Young wished to increase its share in the educational market. They were interested in the academic environment as a source of access to knowledge and innovation. Its contract with University of Utrecht was the first of its kind for the
company.

**The content of the contract**
The outsourcing deal included the entire services of the centre, excluding workplace support. Cap Gemini Ernst and Young leased the computing centre’s office space. The contract was concluded with the involvement of individuals at a very high management level, and they continue to meet regularly in order to co-ordinate their activities.

Cap Gemini Ernst and Young took over all the services without a proper description of them being available. The first job was therefore to describe the tasks. In the beginning there was no strategic plan and the company had to develop its partnerships as it went along. This adjustment took place via numerous meetings and workshops in which everybody tried to get used to each other and co-ordinate the elements of the contract.

In the beginning the university’s approach was to focus on costs. The first agreement contained a maximum amount and a guaranteed profit for the company. When the full sum allocated was not used for running the agreed IT services, strategic ICT projects within the margin of the contract and the annual profit were defined.

The main challenges in the first phase of the outsourcing were:
- The status and privileges of the Centre’s employees in connection with their transfer to a private company, for instance in relation to pension schemes
- Developing the service level agreements
- Breaking down the prices for all the services.

**Management of the outsourcing model:**
The contract defines service level agreements and a framework of key performance indicators covering availability, capacity and so on. Cap Gemini Ernst and Young submits a monthly report to the university on the basis of these indicators.
The service managers from Cap Gemini Ernst and Young meet every week with their counterparts at the university in order to co-
ordinate their activities, and they also maintain close daily contact via telephone and email.

Outcomes
The result has been that the costs have dropped to half the pre-
outsourcing level. During the term of the contract its value has dropped from 8 million Euro to 7 million Euro because of the in-
crease in operational efficiency, and because many services have been put online.

The complexity of outsourcing is illustrated by the numerous ad-
vantages, weaknesses and preconditions which the interviewees point to:

Advantages:
• First and foremost, the quality of the basic IT services has risen and their cost has simultaneously decreased.
• Maintenance is much better, and there is much greater focus on security. Maintenance now has much higher priority. This is because maintenance is a core business area for Cap Gemini Ernst and Young. When the university ran the Centre, mainte-
nance was seen as uninteresting.
• Service level agreements: The university could set objectives concerning what it would try to do during the discussion of uni-
versity level agreements when its staff were running the Cen-
tre. The service level agreements with Cap Gemini Ernst and Young focus on what the university will do if it does not get the service agreed in the contract. How the company provides it is their problem. So from the university’s point of view, the focus is now much more heavily concentrated on the service it is re-
ceiving.
• The pooling of expertise means that the university obtains ac-
cess to the logic and expertise of a private company. The university benefits from the company’s prior experiences with other projects and customers. In addition, the university has access to senior project managers. In universities there is very
often a lack of senior project managers capable of running large IT projects.

- As a large customer the university has access to the best senior-level personnel in Cap Gemini Ernst and Young.
- The standard procedures are regarded as being very good.

**The weaknesses** are seen to be:

- Once the outsourcing contract has been signed it is almost impossible to go back.
- The very specific contract contains insufficient focus on continued innovation. The outsourcing company focuses on the contract and not on the need for continuing innovation and development.
- The operational logic of the two partners is very different. It is difficult to convince people accustomed to private-enterprise logic about the university’s way of doing things and to get them to understand the university’s kind of logic.
- The partner’s interest is to sell as much as possible, and it can get exhausting to always have to be aware of the money issue, especially for those working at the operational level.
- The university loses control over the staff now working for Cap Gemini Ernst and Young. People can leave or get laid off without the university having any say.
- There are hidden costs.
- It is almost impossible to operate with open source and open standards because the company wants to make use of its own standards. This is limiting for innovation.
- The staff are deprived of direct contact with the IT department. Because of the contract there are more layers to go through before any changes can be implemented.
- Outsourcing is mostly of interest in relation to large-scale business operations. Small-scale operations are not very suitable for being contracted out in this way.

The case study points to the following **preconditions** for the success of the outsourcing model:

- Flexible partner. Even with 100% fulfilment of the contract there
can still be complaints, and if the partner does not understand this the contract can go sour. In addition, there is hardly any common ground between the two partners. This emphasises the need for flexibility while at the same time being rigorous in one’s demands and the structure of the business model.

- Awareness of the business drivers for both the outsourcing partner and the university is required, since they are very different. The basic logic is completely different in each case. The university must acknowledge that the private partner has to make a profit.
- The management of the outsourcing cannot be outsourced. Very strict monitoring of the performance of the contract must be maintained.
- The outsourcing partner cannot be relied on to innovate. It may be sticking to the contract, but it will not come up with innovations and improvements.
- The partner’s logic is to make the most of the existing technology, while the interest of the subcontracting party lies in keeping on developing and making use of newer technology.
- The competition must be kept sharp.
- Full support of the board is required.
- A strong business sense is also required.
- The relationships between the people involved are a key issue. Even with an excellent contract, things can go terribly wrong if the relationships are poor. Therefore it is very important to meet regularly. The management needs to follow the procedures and simply replace the managers if the interpersonal chemistry is bad.
- The motivation of staff is very important in the outsourcing process. If the process takes too long and there is too much uncertainty, the best people will leave.

**The future:**

They Cap Gemini Ernst and Young contract lasts until 2005, and then there will be an open bidding process which Cap Gemini Ernst and Young hopes to win.

Both the university and Cap Gemini Ernst and Young sense a
growing interest in outsourcing partnerships in recent years. The competition is getting fierce, since many companies want to enter this market.

From the university’s point of view, cost reduction is the key driver. The assessment is that once the universities realise that a particular IT function is not a core activity and they can obtain higher quality at lower cost, the level of interest will increase even further.

Cap Gemini Ernst and Young does not have any plans for developing its services towards producing academic content or study material.

Co-operation with national and international universities on a project basis

The University of Utrecht is involved in various forms of co-operation with other universities, both nationally and internationally. Its co-operation ventures are mainly either project-based or ad hoc. It is not participating in any partnerships involving the development of content or joint programmes.

Every second month the Dutch universities’ ICT co-ordinators meet to swap experiences.

The university is also involved in the following projects:
- COM IT.
- SURF project, requiring an element of national co-operation.
- The Dutch Expertise Centre for Digital Learning.
- U-learn (EU project).
- Eye-Lab (EU project).

Co-operation with private partners

There is currently a lot of debate concerning public-private partnerships. The overall assessment is that they can be useful if the right conditions exist. The University is not involved in any other large-scale co-operation with private partners other than the one with Cap Gemini Ernst and Young Ernst and Young.
6.4. The educational setting

General use of ICT in teaching – blended learning

The extended use of ICT in teaching is one of the objectives contained in the University of Utrecht’s 2000-2004 strategic plan. The main aim is to use ICT to support and develop face-to-face education, and hence to develop ICT didactics and pedagogy. E-learning is not seen as a particularly valuable approach, since the university believes in face-to-face contact in the learning situation. The demand for e-learning courses is also regarded as being limited because of the compact size of the Netherlands and the relatively small number of Dutch speakers. Accordingly, the various models of blended learning are seen as being much more appropriate to the University of Utrecht’s situation.

The use of ICT in the teaching varies tremendously between the institutes and the teachers, and there is no overview of its general status.

The university is aiming at a more integrated learning approach and an opening up of the traditional physical library setting in the direction of study landscapes, which will combine library services, study facilities and ICT facilities.

Electronic portfolios

The University of Utrecht has worked with portfolios since the mid 1990s. Since 2001 it has experimented with electronic portfolios. The aim was to strengthen the learning reflection process and thus get a better overview of the learning process and outcomes. The electronic version had the obvious advantage of reducing the paper load and harmonising the portfolios.

General use of electronic portfolio among students

Following the introduction of the bachelor/master programme involving more freedom of choice for the individual student, electronic portfolios are mandatory for all bachelor students. Electronic portfolios were introduced with the aim of monitoring the academic growth of the students, and to stimulate them to reflect on their development.
The portfolios are introduced very differently to the students. Some students are given a course on the subject, such as in the law faculty, and others are not. The project only started last year and it has not been implemented yet in all the institutes. The board’s decision means that students cannot finish their bachelor’s degree without completing their portfolio, but this is not yet being enforced.

**Use of electronic portfolio among university staff**

In principle the electronic portfolio is mandatory for the university’s teachers. The framework for the teaching staff portfolios includes a CV, study plans and key competences.

A decision by the Board states that all teachers must develop a portfolio, and that doing so is a precondition for obtaining promotions. All new teachers put them together, but it is harder to get the existing staff to do so. Therefore the Board’s decision is not being enforced, and its actual implementation is up to the faculty management.

A commission decides the content of the portfolio framework, as well as the key points and competences which must be included in it. At the moment no ICT competences are specified, but that will probably change in the near future.

Below are two screen shots of the portfolio.
### Academische vaardigheden

<table>
<thead>
<tr>
<th>Vaardigheids domein</th>
<th>Aangewerkt via</th>
<th>(Zelf) beoordeling</th>
<th>Voornemens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodologische vaardigheden</td>
<td></td>
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<tr>
<td>Informatieverwerking</td>
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<td>Informatieverwerking</td>
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<tr>
<td>Gebruik van modellen</td>
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<td></td>
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<tr>
<td>Reflectieve vaardigheden</td>
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</tr>
</tbody>
</table>
IVLOS teacher training programme

The IVLOS teacher education programme is a one-year masters course which requires a bachelor’s degree to enter. The foundation of the programme is the development of an electronic portfolio whereby the students are made to experience six different teachers’ roles through practical teaching, and then reflect and expand on these roles in their portfolio. The framework of the portfolio corresponds to the example shown below:

While developing the portfolios the students give each other feedback on their portfolios, how they present themselves, and their learning process and results.

As an experiment, this year the portfolios will replace the exams in this course. This implies that the portfolios must display the academic profile and level of academic skills for each individual student. Originally it was meant to be a learning device, but now it is also developing into an assessment tool.

According to the teachers some students do not quite see the portfolio as a learning device but think of it more as an IT tool. The students interviewed could see the value of the portfolio, but they were concerned with its use as the sole basis for assessing them.
The overall point concerning the discussion of strengths and weaknesses in the use of the electronic portfolio in teaching is whether it stimulates the right competences.

The students and teachers involved point to the following strengths:

- The electronic portfolio strengthens reflection concerning the learning process and makes both students and teachers more observant of tacit knowledge, strengths and weaknesses.
- It develops basic ICT skills.
- It is seen as a good instrument for establishing dialogue between students and teachers.
- The electronic format forces the students to focus more on the structure and presentation of its content. The digital versions are much more to the point and reader-friendly than the paper versions, which tend to be very long and confusing.

The weaknesses highlighted were:

- There tends to be too much focus on the portfolio framework and presenting results and reflections so that they fit this framework. This removes the focus from the actual teaching. There is a danger of spending too much time on the form and presentation and not enough on the content.
- It is very time-consuming to develop.
- Technical problems. It is possible to access it from everywhere, but it does not always run very well on every kind of infrastructure.
- The portfolios are also being used as an assessment tool, which might work counter to the students discussing their weaknesses.
- Some students may be poor at presenting themselves as successful.

As discussed further below, some of the challenges in the development of ICT are to strengthen the incentives for doing so and to highlight the advantages of using ICT in teaching.

The University of Utrecht has started developing its qualifications system towards the acknowledgement of ICT qualifications and
good ICT-based teaching in its payment and career structures. The board has decided that the teachers must demonstrate their teaching abilities, and the portfolios play an important part in this development.

6.5. Outcomes and lessons learned

| Main drivers for ICT integration at Utrecht University | • The SURF programme has pushed the development in the form of a funding opportunity |
| | • The existence of considerable competition, plus the desire to be in the forefront as the largest research university in the Netherlands |
| | • The research facilities |
| | • Students demand it |
| | • A bottom-up approach in which some faculties have been very innovative |
| | • The management |

| Main obstacles and challenges concerning ICT integration at Utrecht University | • Older staff are not used to using ICT. But this is not an obstacle in the long run. |
| | • Lack of funding. Resources are needed to really push the development in terms of infrastructure, competence development and development of content and pedagogies. |
| | • Lack of time. The support services are available at the ICT expertise centre, but the demand is limited, because the teachers and institutes lack the time to initiate project developments. |
| | • Ownership rights and copyright are very big obstacles especially in terms of the development of library services. |
| | • Lack of a strategy and vision concerning integration in the education. The link between the policy level and the level is not strong enough. A policy level which focuses on IT and an ICT educational centre, but there is not much co-ordination. |
| | • Some staff members are change |
| | • Lack of experience concerning ICT pedagogy |
| | • Lack of business drivers. The incentives and motivs for the individual teacher concerning why they should engage in this
still unclear Why should I be involved with ICT when I am doing a good job?

**Preconditions for success in the developmental process**

- The business model has to be demand-driven.
- The only approach that works in a university is a bottom-up one.
- There have to be more incentives for the individual faculties, institutes and teachers to push the development of ICT further.
- Management and leadership.
- Need to communicate the business drivers more. The individual teacher should understand why ICT development is good, and should be able to see the incentives for getting involved.

**Areas in need of further development**

- Teachers need to be rewarded for good teaching. The career development structure for teachers should be developed further, and ICT competences should be a part of this. This should also be linked to the payment structure.
- Dissemination of good practice and experience, mainly concerning ICT pedagogy and content development. The SURF foundation already performs some activities in this field.
- Development of new business models and regulations concerning intellectual property rights and copyright.

**Need for EU cooperation**

- According to the interviewees, the EU has a very important role to play in terms of physical and virtual mobility.
- There is a need for proper authentication across national boundaries.
- A lot of money is spend on programmes with narrow outlooks. Many programmes lack a market perspective. If such ICT innovations are not co-ordinated and expanded into larger scale developments, they will stay at the level of the innovators and will never be scaled up to national level. It is too complex an objective to achieve alone.
6.6. Sources and links

Interviewees
- Peter Schelleman, Chief Information Officer, Utrecht University
- Wim Kardux, Member of Board, Utrecht University; Member of Board, SURF foundation; chair, SURF programme on IT and organisation
- Bas Savenije, Director, University Library
- Wies de Haas, project manager, Osiris (Web Based Learning Management System)
- Ineke Lam, University IT expertise centre
- Wilfred Rubens
- Jan van Tartwijk, project manager, University IT expertise centre
- Martine van Rijswijk, University IT expertise centre
- Frans Kranenbourg, Bilingual department, teacher in the Teaching Training programme using the digital portfolio
- The PLS-RAMBOLL assessor attended a class in which eight students from the international teacher training programme held a discussion and gave feedback on each other’s digital portfolios.
- Ineke Molenaars, Practice manager, Cap Gemini Ernst and Young

Contact information
- Utrecht University
  Heidelberglaan
  3584 CS Utrecht
  www.uu.nl

Strategy (in Dutch)
http://www.uu.nl/content/StrategischplanICT.pdf

Examples of projects involving ICT
www.surfnet.nl

Other material
- Presentation by Peter Schelleman: OTR forum, The Hague, April 18, 2002; Bestuursslunch December 18, 2001; Humane, Helsinki
- Jan van Tartwijk et. al, “A multi-purpose electronic portfolio: tensions and possibilities”
7. Case profile for the UK Education Healthcare Partnership, United Kingdom

This case profile comprises the presentation and analysis of the integration of ICT at the UK Education Healthcare Partnership (UKHEP). The case study is one of eight which have been carried out as part of a strategic study of virtual models for universities. The eight best practice case studies have the purpose of enabling an in-depth understanding of the various models of ICT integration in universities, and also of the trends and perspectives they provide in relation to future scenarios.

Additionally, the case studies are intended to publicise the experiences and lessons learned from those institutions or partnerships which are well advanced in their integration of ICT in university education.

This case profile is based on interviews carried out during a two-day site visit in May 2003 to the institutions participating in the UKHEP, plus additional telephone interviews and written material concerning the national UKeU initiative and the UKHEP.

The focus of the case study is the UKHEP, mainly from the perspectives of two of the participating institutions, City University and the Royal College of Nursing.

The profile starts out by introducing the UKHEP, the national UKeU initiative and the participating institutions. Subsequently the profile focuses on the partnership model and the educational model. The overall strengths and weaknesses and the preconditions for success are presented next. Finally, the various sources used in compiling the profile are listed.

7.1. Presentation and background

Background information on the case study institution

The focus of the case study is the UK Healthcare Education Partnership. The UKHEP partnership is a consortium comprising the Royal College of Nursing (RCN), City University, the University of Leicester and the University of Ulster.

UKHEP was created in May 2003, but the four institutions have been working in partnership since November 2000. Its programme and courses will be launched in the beginning of 2004. A pilot
module will be offered in September 2003.

The overall aim of the UKHEP is to make a significant contribution to the post-registration education of health professionals in the UK and overseas by developing and delivering a range of high quality online learning. The Partnership will be developing a range of eLearning opportunities, aimed at healthcare professionals, which will run on the UKeU’s eLearning platform.

The partners in the UKHEP are:

**Royal College of Nursing (RCN)**
RCN is the leading professional nursing organisation. It works to represent patient and nursing interests and to safeguard and develop the nursing profession. An important aspect of this is assuring the supply of high quality professional education and training. E-learning and various forms of blended learning are seen as crucial in this regard, so the RCN has worked to promote and develop this.

The RCN Institute, a small and specialist higher education institution, funded by the Higher Education Funding Council for England (HEFCE), already runs five paper-based distance learning programmes for post-registration nurses throughout the UK, Republic of Ireland and Iceland, as well as individual students in a range of countries throughout the world. The RCN Institute also delivers a research degrees programme.

**City University**
City University was founded in 1894 as the Northampton Institute and was awarded full university status in 1966. It is based in the heart of London and has almost 10,000 students from 153 countries who benefit from the University's internationally renowned experience of more than one hundred years' teaching and learning. The efforts of City University are guided by six strategic objectives:

- to provide high-quality education which meets the needs of its students and their employers
- to develop and enhance research based on acknowledged
standards of excellence
• to influence policy and practice within its selected areas of expertise
• to make a significant contribution to the success of London as a world city
• to increase the international scope and reputation of the University
• to develop the University through growth and strategic collaboration

The university offers university education at three levels, namely undergraduate, postgraduate and courses for adults, and has specialised in the following six fields:
• health
• business and law
• mathematics, engineering and informatics
• social sciences
• creative and cultural subjects
• continuing education and professional development

The main co-operating partner in the UKHEP is the St. Bartholomew School of Nursing and Midwifery at the Institute of Health Sciences.

University of Leicester
The University of Leicester is one of the older universities in the country. Founded in 1921 with nine students, the fledgling college gained full degree-awarding powers in 1957 when it was granted its Royal Charter. More than 18,000 students are registered for the University of Leicester’s programmes, of which over 7,000 are full-time campus-based undergraduates. The University works closely with business and industry, and particularly in the fields of medicine, biological sciences, physical sciences and engineering it has established links with company research and development programmes.
University of Ulster

The University's course provision is the largest in the island of Ireland, covering arts, business and management, engineering, information technology, life and health sciences, and social sciences. Its courses include a strong vocational element, and the majority include a period of industrial or professional placement. Core business activities are teaching and learning, research, technology and knowledge transfer.

The national initiative: UKeU

The UKHEP has been developed as a partnership under the national initiative, the UK e-Universities (UKeU).

The UKeU is a government-funded public-private e-learning initiative set up as a private company, UK eUniversities Worldwide Limited. The Higher Education Funding Council for England has coordinated its development, and the Government is allocating £62 million for the 2001-2004 period to match contributions from the private sector. The aims of the UKeU are twofold:

- to deliver high-quality education to a global market, principally to overseas students via the Internet.
- to develop a learning platform to facilitate this development.

The company was incorporated on 19 October 2001, and the first courses became available in Spring 2003, including courses from several universities. The shareholders are UK universities and colleges, which submit proposals to become partners. Through their holding company the UK colleges and universities have granted UKeU a licence to deliver their courses online.

Universities submit proposals to become partners. They are assessed on the basis of quality, the scope for commercial success, innovation, and their partnership model. In general, the UKeU then works with the partner universities to develop the courses.

Interest from UK universities has been considerable. Last year 69 universities submitted proposals. The UKeU is currently working with 20-30 of them, and is in discussions with several others.
The UKeU is offering UK universities the opportunity to deliver their offerings to a larger target audience. There are two main markets for its courses:

- individual students who want to take a course paid by themselves or their company
- large corporations which want to offer courses to groups of employees.

In order to sell the courses to students around the world the UKeU needs international partners who will be selling actors and will provide support locally. This aspect still requires further development. Possible partners might be the British Council and local universities.

It is not the direct objective of the UKeU to support ICT integration in UK universities. Its objective is purely the commercial one of developing a way of exporting UK university education. It has a high-quality brand which a good international reputation. However, the extended use of ICT in other areas of the universities may very well turn out to be a spin-off effect of the latters’ involvement in the UKeU. The fact that they have enjoyed support in creating the e-learning programmes through their involvement in the UKeU could lead to a strengthened development.

In general, the role of the UKeU is to create and provide the learning environment and to build the infrastructure. The UKeU does not itself engage in the development of content, but it has a team of experts which supports the universities in their development. The participating universities have very different levels of experience with e-learning. Some need a lot of help, while others do not. Most of the participating universities get their expert assistance from other expert and private companies. The UKeU then acts as a marketing facilitator which can lead them to new student markets.

The UKeU has decided to develop its own learning platform instead of using one of the existing learning platforms such as
WebCT or Blackboard. The reason for this is that none of the existing platforms was designed specifically for e-learning, but took campus-based teaching as its point of departure. In addition, they were not designed for a global audience. UKeU wanted an environment whose platform supported scalable content. The platform is now based on open standards, and is constructed so that it can be used in conjunction with other platforms. All UKeU activities will run from its platform, which will also be licensed for more widespread use. For instance, the University of Ulster has decided to switch all its e-learning activities to the UKeU platform.

The business model for each partnership varies and there are a number of different funding methods, but the specifics of the models have not been revealed. The details will depend on the negotiations between the parties, the amount of risk involved, and the quality and ambition of the partnerships and their proposed business models.

The fact that UKeU is so heavily backed by the government is regarded as a great advantage, since its economic foundation is therefore very robust. According to the interviewees, a national initiative of this size has considerable potential as a driver for the development of various models of e-learning and partnerships. UKeU has the financial muscle to employ people with a lot of expertise and state-of-the-art knowledge. Therefore it has the ability to ensure high quality, which could be a very important driver if it decided to invest in nationally co-ordinated content development. However, this has not been incorporated into its objectives.

The initiative is still in its early phase, and according to the interviewees it is too soon to say whether the basic idea of exporting UK university-branded e-learning to a larger audience will succeed, or what the spin-offs will be. At present the main challenge is to launch the platform, which has been delayed several times.

7.2. Co-operation, partnership and business model

The partnership was initiated by the RCN who developed the idea in 1998 following a strategic review of its higher education
provision. The vision was to transform professional education for nurses by developing and supplying new forms of flexible high-quality education and professional training in a global perspective. The RCN investigated the study patterns and needs of health professionals, and realised that in order to accommodate these needs the courses would have to be flexible and specifically-targeted in order to enable a busy nurse to use his/her time as effectively as possible. E-learning was seen as the optimal way of building on its current reputation for distance learning for nurses by being able to offer high-quality flexible education and training for professionals and to enhance access for all in a global perspective. The decision to work in collaboration is entirely in line with the Government White Paper on higher education, published in January 2003.

The RCN’s original ideas were developed independently from the UKeU initiative. However, substantial investments were necessary in order to realise the project, and the creation of UKeU provided the opportunity to obtain access to funding.

The RCN selected its partners via a rigorous process in which it first had informal discussions with 14 universities and six of them were invited to submit a formal proposal. The three partners were selected on the basis of their commitment to the vision and the partnership idea, their fields of expertise and a sense of being able to work together effectively in a partnership.

The basic idea is that together, the four of them can achieve more than they can separately, since greater expertise can be applied to developing the courses.

An innovative aspect of the partnership is that its courses are being developed and delivered jointly and specifically that the partners will have joint degree-awarding power. This means that the students will receive a joint degree from the three universities and where appropriate accreditation from the RCN. To begin with this was not possible according to the original charters of several of the participating universities, which therefore underwent the fairly
onerous process of amending their charters. This underlines the commitment of the participating universities.

**International partners and private partners?**

At this point there are no international partners in the UKHEP.

There may be an opportunity for the inclusion of international partners in the future, and that could certainly introduce some interesting features into the partnerships. But in the start-up phase it has been important to try to keep the partnership model fairly simple.

No private partners are involved in the project at present.

**The UKHEP business and management model**

The partnership has been set up as an equal partnership between the four parties, i.e. between the three universities and the RCN.

The overall management is conducted by the Board of directors, which consists of 8 directors from the four participating institutions. They are responsible for the overall strategy, policy and finances. The chair rotates every second year. RCN is occupying the first chair, since it has been the main driving force in setting up the partnership. The executive director, who has yet to be hired, will carry out the daily management of the partnership. In addition, a project executive team is responsible for implementing the policies and co-ordinating the development of the modules.

The partnership is funded by a non-recourse loan from the UKeU of £2 million. If the partnership succeeds the UKHEP will pay back the loan plus interest. The anticipated return to UKeU is around 18%. The UKeU funding covers the development of 14 modules, which will be developed at both undergraduate and postgraduate levels.

The business model includes plans to sell modules and courses both to individual students and to employers of healthcare professionals, both nationally and internationally. As the partnership is still in a very early phase, these plans are currently being dis-
The interviewees emphasise that in an ambitious and large-scale partnership like this involves a lot of innovation and the development of entirely new ways of doing things, it is important not to move forward and expand too quickly. The background and foundation have to be in place before you can move on to the next level.

The ambition is to create a sustainable financial model involving committed partners who accept the idea that they are in a long-term partner in this partnership. The purpose of the partnership is not generating cash for the shareholders, but instead invest any profits in the development of new modules and courses instead.

The structures within the partnership are still quite informal. In the future it will be more of a corporate entity, and all services will be contracted. The current model is based on working groups in which one of the four institutions takes the lead of some of the aspect of the partnership. They then are given the necessary funding to undertake the work and will invite relevant expertise to contribute where appropriate. For instance, there is a working group on library and information services, which is responsible for preparing documentation and presenting its case to the rest of the partnership.

The partners have been selected because of their expertise and commitment. Each brings expertise and competences in specific areas into the partnership. For instance, City University is managing the QA procedures.

One of the key values of the partnership is that it is working hard to develop UKHEP ways of doing things instead of RCN or City University ways of doing things. This is seen as important for the success of the partnership.

Relationship to UKeU

The idea for UKHEP was developed independently of, and prior to, the establishment of the UKeU. Instead, the UKeU was an investment opportunity that was able to provide part of the funding for the very costly initiative of developing the e-learning mod-
ules. After the settlement of the contract with the UKeU and the agreement on the conditions and the business model, there will be no serious connection between the UKeU and the UKHEP in the running and implementation of the partnership. The main basis of the relationship is that the UKeU will be the website host, and that the partnership will be using the UKeU platform to deliver its modules to the students. The UKHEP works independently in terms of education and academic settings and has decided not to purchase the marketing services that the UKeU can offer for the UK market, but it will be working with UKeU marketing colleagues to recruit international students. Within the UK the UKHEP will use its own expertise to market the modules/courses.

### Development of the course modules

The model for the development of the modules is based on workshops with various representatives from all four partners. At these workshops it was discussed how they should work together and what should be the main elements in the modules. As mentioned above, one of the participating institutions takes on the responsibility for leading the activity and then invites the other members to contribute.

The actual development of the content of the modules is done by the partnership. The selected individuals from each university contribute to the curriculum development and draw up the foundation for the module. Then they each do their share of authoring the material, and get together with the instructional designers. In the working process material is sent back and forward in order to make corrections and comments. The process is very interactive, and because of this it is more appropriate to retain both the content development and technical development as partnership activities than to subcontract them to external parties.

### The partnership model – strengths and weaknesses

The interviewees all expressed general faith in the model, and are enthusiastic about the general idea and the partnership model, although they underline that the partnership model is still evolving and will need to be refined in step with the progression of the project.
It is seen as very important that high-profile individuals from the management of each of the four partner institutions have been involved in the process from the beginning and are taking an active part in the evolution of both the partnership model and the course development model. This indicates the level of commitment to the partnership, and sends very important signals to the remainder of each institution that this commitment must be prioritised and has management backing. It is the assessment of the interviewees that it is easier to maintain commitment and focus within the institutions because their senior personnel have been involved from the beginning.

As mentioned previously, the UKeU funding depends on the financial success of the programme. According to some of the persons interviewed this is crucial to the partnership, as well. One of the main items for discussion has been the exit strategy and the criteria for winding down the business if it does not achieve its sales targets.

The case study points to the following strengths in the UKHEP model:

- It is important that the university partners should have the same internal structure and charter model. This means that they recognise and understand the associated internal procedures and possible problems.

- The composition of the partnership is sound. The four partners are necessary in order to cover the main areas of expertise required. The partners know and trust each other, and they all acknowledge the advantages and benefits of working together. They share the general belief that together they can achieve more than they can alone. The other partners are seen as bringing skill and useful expertise to the partnership.

- The awarding of degrees jointly signals mutual recognition and approval by the partners, which they regard as a reciprocal stamp of quality.

- They are not competitors. The regular students that enrol, for instance with City University, do so because of their location in London and its reputation. The issue of competition would
have been different if its partners originated from or near London. But since they are from cities out of London, this is not perceived to be a problem.

- There is a lot of scope for initiative and innovation. The process of developing the content together consolidates the best practices of four higher education institutions.

According to the interviewees, the partnership model is subject to the following weaknesses:

- Even though the partners are quite alike in their organizational structure there are still differences in the educational culture and ways of doing things. Therefore the partners constantly need to discuss and agree on such things as the level of ambitions or specific processes.
- The quality assurance process is an example of this. The QA systems of the four institutions are different and it is necessary for them to spend a considerable time agreeing on the model that will be used for the UKHEP. However, it should be underlined that the interviewees all highlight the value of these processes as well.
- The structures are still quite informal and there is a lack of detailed planning. This can result in slowness of response.
- The partnership and the development of the modules has involved a lot of hidden costs and transition costs in terms of meetings, co-ordination and so on. Because the partnership is not driven by profits these costs have not been estimated and included as part of the business model.

### 7.3. ICT integration in City University – role of the UKHEP

**Drivers for engaging in UKHEP**

For City University, entering into the UKHEP was not part of an overall ICT and e-learning strategy. It is more likely that it was a tactical undertaking which represented an opportunity to access the funds necessary to meet the e-learning development costs, which it could not otherwise have financed. It was also an opportunity to engage in a development project with other partners. Thus its motives were opportunistic and ad hoc, something which is un-
derlined by the interviewees as being the usual way of becoming involved in development projects.

City University had the ambition to expand and to increase its student numbers. Since the costs of physical expansion are very high, e-learning is an obvious way of overcoming this barrier. The partnership provided an opportunity for City University to work with e-learning in a consortium, with the hope of capitalising on the consortium’s joint e-learning expertise.

Finally, they were encouraged by the RCN proposal and motivated by its high quality. The approach was strongly focused on the student perspective and there was a solid sense of innovation.

At the beginning there was no plan or vision for how the university’s participation in the partnership should be co-ordinated or integrated, or what role it should play in the university’s strategy. According to the central management of the university, all its current plans will shortly be co-ordinated. City University is involved in several other e-learning projects, and the intention is for all these ad hoc projects to be incorporated into the overall strategy and action plan for the university.

City University currently sees itself as being in a transitional phase of working on a more comprehensive strategy which integrates all aspects of the university’s e-learning and ICT. The general development trend is one of pockets of activity that coexist without coordination. Overall, the university has put a lot of money into ICT and e-learning projects, but not according to a central plan. This is partly because the academic units and institutions enjoy a high level of autonomy and have their own management and development departments. In order to try to strengthen the central co-ordination of ICT and e-learning activities, the university is currently engaged in establishing a central e-learning policy office which will lead the implementation of the strategic aim of mainstreaming e-learning activities into all areas.

60% of the students at the university are post-graduate students,
and they are demanding e-learning. This is especially true for its business and profession-oriented courses.

At the moment the level of ICT integration and use of e-learning varies tremendously among the institutes and academic units. Some courses are already fully on-line, and it is anticipated that in 3-5 years all courses will contain some element of e-learning.

The library and information services are areas which are currently seeing much ICT activity. They are in the process of gradually establishing an online library. One of the key challenges in this respect is to get students and teachers to deliver course programs, curricula, reports and material electronically. They are gradually speeding up this process by first requesting these items in electronic format. After a while they will simply leave out all material that is not delivered electronically in order to force the teachers to go along with the transition to electronic documentation.

**Technical infrastructure**

The technological infrastructure varies among the different programmes and courses. All students have access to network facilities, but in general the classrooms are not adapted to facilitate ICT-supported education or e-learning. There are a few interactive teaching theatres, but only a small proportion of the students has access to these. One of the main problems in this regard is the lack of any available funding for the physical surroundings and the infrastructure from the university budget.

**Drivers for general ICT development**

The drivers for the general ICT development are for the main part identical to the drivers for entering into the UKHEP.

In addition, the interviewees point to the fact that City University is seen as quite prestigious, and therefore has a reputation to maintain. As regards the business school, both the labour market and the students expect its teaching and facilities to be up-to-date, as well as that the university will keep up with the labour market, which is well advanced in its use of ICT.

Efficiency is a key driver for the areas of administration and organisation. The university does a lot of administration on-line, such
as course and examination registrations, and this will expand further.

Finally, the interviewees pointed to market competition and the possibility of expanding and exporting education to overseas markets as being an important driver.

**Obstacles for ICT development**

The main obstacle to the development process in the direction of the expanded use of ICT and e-learning is considered to be legislation, in particular problems with copyright and ownership rights. These matters are far from being resolved, and they create huge difficulties for the sharing of content and library services.

Furthermore, the interviewees point to the following obstacles:

- Lack of funding to facilitate the necessary infrastructure and adaptation of the physical environments to accommodate ICT-based education. A lot of funding has been invested in WebCT, but more resources are necessary.
- Perceptions of some of the academic staff. Some teachers are very reluctant to use ICT in their teaching, especially if they see it as a management initiative which is being pursued in order to save money. The challenge is to communicate the processes really well, and to highlight the educational and staff development advantages.

**Precondition for success**

According to the interviewees, one of the main preconditions for success is an acceptance that the change process takes time, and that it cannot proceed according to a fixed plan or strategy but has to develop on an ad-hoc basis involving a lot of flexibility. It must be grounded among the staff, and therefore involvement in the ICT-based projects has to be voluntary. However, it is extremely important that the process is backed by management, and that the management should signal its focus and the priority being given to ICT.

**Incentive schemes**

The incentive at City University is mainly that key individuals from management are backing the process and its UKHEP involvement. As a consequence, ICT and e-learning are seen as being relatively
prestigious areas to be involved in.
City University is also working to raise the status of teaching. It gives teaching awards, and is trying to break down the dichotomy between research and teaching, for instance by creating career structures that reward good teaching. This is in line with the Hefce white paper, which outlines the importance of focusing on incentives that encourage good teaching.

7.4. The educational setting

The UKHEP learning model
The UKHEP courses have not been developed on the basis of a specific learning model, but are based more on what the partners believe works.

The keyword is flexibility. The courses will be designed so that the nurses can construct their own degrees to fit their particular needs. Hence, the modules are being developed so that they can be combined into degrees, and modules from other educational institutions can be accredited and recognised within the programme. In addition, the students can choose whether they want credits for their courses or not. This is important, since not all the students need credits. The payment model is adjusted accordingly.

All modules are 100% e-learning in format, so there is no physical meeting. The actual learning approach in the modules combines web-based text with various kinds of reflection and interaction among students, tutors and the material.

Software is being developed to direct the students in certain directions, for instance a video clip designed as the starting point for a discussion and further interaction between students. They also use a range of other media, as well as links to texts and literature.

Every student has a tutor, with the ratio being approximately 25:1. The role of the tutor is to comment on the discussions, engage in dialogue, help the students and answer questions. The students will be assessed through work-related coursework submitted online.

Target group
The target group for the modules/courses are trained staff and pro-
### for the UKHEP courses

professionals within the health sector seeking further professional education and professional update.

The pilot module focuses on leadership and will be launched this autumn. It is the plan to develop courses and modules at all higher education levels.

### Teachers involved

The UKHEP is currently in the process of recruiting tutors for the first modules to be launched this autumn.

The level of interest among teachers varies considerably. Some are very interested, while others are reluctant to become involved in the whole process.

### Quality assurance

City University has considerable expertise in the field of quality assurance and is the institution taking the lead for quality assurance for the UKHEP.

The quality assurance model selected is not very different from the universities’ regular quality assurance processes. UKHEP has set up joint structural committees for each module comprising representatives from each university. They develop the content and make sure that the quality standard follows the requirements set for the academic level in question.

According to some of the interviewees, e-learning modules should undergo a different quality process which is different from regular quality processes. They emphasise that a central quality assessment and assurance agency would be a good idea.

### Strengths and weaknesses concerning the UKHEP educational setting

According to the interviewees, it is important to consider the target group carefully when developing e-learning modules. E-learning may not be suitable for all purposes or target groups. The development of communication skills is an example of a subject which is not suitable for e-learning, and for which a shared physical environment is required.

Another important consideration for the learning model is that
sometimes an educational innovation can be ahead of the technical solutions and what can be made to work on a technical level. An innovative and well-thought-through educational model is worth nothing if the technology cannot support it or if it is not technically reliable.

The case study points to the following strengths in the UKHEP educational setting:

- The modules will be accessible to people in their own time and do not involve geographical constraints or the need for travel time.
- The modules are very flexible.
- Students can follow their own learning process in the e-learning modules more easily than with traditional learning. They can go back and review what they have done, correct it and reflect on the learning process.
- The modules will be accessible to new target groups.
- The joint electronic library and information services can make a lot more material accessible to the students.

The weaknesses in the UKHEP model are:

- Healthcare staff are often interrupted whilst at work and in general it is seen as acceptable to disturb people who are sitting in front of a computer. This is a weakness for those taking an e-learning module.
- According to some of the teachers involved, the e-learning model involves some learning weaknesses. The best model from a learning perspective is seen as involving some elements of face-to-face interaction. This is important for creating a sense of community and permitting the teacher to follow the learning process. The teacher should be able to see for him/herself how the modules are working in real life, and whether parts of the modules are working differently than expected.
7.5. Outcomes and lessons learned

Key challenges for the UKHEP

The interviewees all agree that even if the UKHEP does not succeed financially, they believe the project is a great success. The general impression is that the approach of partnership working is very fruitful and that everyone has learned a great deal.

The key challenges in the coming years are seen as the following:

- Keeping the focus on the educational and learning issues. The business and partnership models tend to absorb a lot of attention, which may displace the focus.
- However, the partnership still needs to be refined and adjusted according to its stage of development. It needs to be better at estimating the hidden and transition costs and concluding service level agreements. Another key issue is to develop a new way of negotiating contracts within the partnership.
- The partnership needs to focus on how it can strengthen and maintain the commitment among the staff and individuals involved in it.

Preconditions for success for partnerships

- Trust and commitment are seen as the most important preconditions for success in this type of partnership.
- A clear partnership strategy and a sound knowledge of the market.
- A sound business model, with clarity about who is doing what and who is responsible for what.
- Harmonising the level of expectations and corresponding agreement on the level of quality and ambition. Some wish to be the world champions, while others are more pragmatic.
- Involvement of senior staff, indicating commitment and priority.
- Motivating voluntary participation, and being aware that no-one can be compelled to join in. However, the staff need to feel that this is a necessary development, and this perception should be backed up with incentives for them to participate.
- Not allowing business issues to overshadow pedagogical ones. The original proposal was centred on the educational goals, and these were what inspired people. The partnership and business issues tend to absorb a lot of attention, with the risk of...
diminishing the importance of the educational considerations.
• Systematic analysis of the skills needed to develop and implement the various aspects.

Trends and scenarios

The future for the UKHEP could mean the involvement of more health care professionals as partners, and the interviewees also see the possibility of other partnerships developing within the structure.

They see a clear tendency for the universities to become more involved in partnerships, including ones with private partners. However, overall interest has weakened because of the general economic situation, and in addition the general experience has been that the business ethos is not very compatible with that of the universities. The profit motive is sometimes hard to assimilate into the logic of the university. Private companies could be involved in more limited roles, however.

Areas in need for further development

• How to quality assure and accredit e-learning modules.
• Best practice in terms of content development.

Need for EU co-operation

The interviewees point to the following areas in need of EU co-operation:
• Common quality assurance and assessment procedures
• Dissemination of good practice concerning content development
• Facilitation of partnerships. The EU could investigate institutions involved in the same fields of expertise and facilitate their co-operation.
• Assist in resolving conflicts concerning ownership, intellectual property rights and copyright.

7.6. Sources and links

Interviewees

• Dr. Liz Clark, Head of Distance Learning, Royal College of Nursing
• Professor Alison Kitson, Executive Director Nursing, Royal Col-
Contact information
Liz Clark/Alison Kitson
The UK Healthcare Education Partnership:
UK Healthcare Education Partnership

Consortium website
www.ukeu.com

Partner websites
The Royal College of Nursing – www.rcn.org.uk
City University – www.city.ac.uk
University of Ulster – www.ulst.ac.uk
University of Leicester – www.le.ac.uk

Reports and other documentation
http://www.dfes.gov.uk/highereducation/hestrategy/pdfs/DfES-
HigherEducation.pdf
8. Case profile for Bremen University, Germany

This case profile comprises a presentation and analysis of the integration of ICT at the University of Bremen. The case study is one of eight which have been carried out as part of a strategic study of virtual university models.

The eight best practice case studies have the purpose of enabling an in-depth understanding of the various models of ICT integration in universities, and also of the trends and perspectives they provide in relation to future scenarios. Additionally, the case studies are intended to publicise the experiences and lessons learned from those institutions or partnerships which are well advanced in their integration of ICT in university education.

This case profile is based on written interviews conducted in July 2003, and on written sources concerning the University of Bremen and the national ‘Laptop University’ initiative.

The profile starts out by introducing the university and its strategies regarding the use of ICT. Then the organisational model of the university is presented, followed by a description of how ICT is used in the educational setting. After this, examples are given on how the university co-operates with other universities, public and private partners. The case profile ends with an overview of the lessons that can be learned from the University of Bremen.

8.1. Presentation and background

Background information concerning the University of Bremen

The University of Bremen is situated in north-western Germany. The university covers the subject groupings of Humanities, Social Sciences, Natural and Technological Sciences, Law and Arts. The University is the place of study for some 19,000 students and 1,427 full-time scientists, and is the workplace of 910 full-time employees.
The University of Bremen has a single campus. Around the campus are situated other research institutes, such as the Max Planck and Frauenhofer Institutes, as well as a Technology Park in which many start-up companies are based.

The University of Bremen is a relatively new university, having opened in 1971. It was then considered a reform university because of its pursuit of new approaches to teaching and research. The University of Bremen was founded with a dedication to interdisciplinarity, an emphasis on the applicability of academic findings, and an awareness of its responsibility to society. According to the vice rector Peter Richter, the terms used are the same today as they were then, but their meaning has developed in step with the university. ‘Interdisciplinarity’ then meant attacking problems in terms of ‘projects’ without serious foundation in the related disciplines; now it means a thorough initial grounding in the disciplines, then an attempt to apply them in larger contexts and in co-operative ventures. ‘Applicability of academic results’ once meant a critical analysis of existing society; now it refers to the development
of technology. ‘Responsibility towards society’ once meant solidarity with the underprivileged; now it means support for the (regional) economy and the careful use of resources and the environment.

**Key challenges for the University of Bremen and the approach to ICT**

There are six official strategic goals (‘Leitziele’) for the University of Bremen:

(i) High quality of teaching and research
(ii) Responsibility to society and concern with problems of practical relevance
(iii) Interdisciplinarity
(iv) Internationalization of teaching and research
(v) Gender mainstreaming
(vi) Sustainable use of environmental resources.

ICT is a tool for attaining these goals, as it is used to promote closer interaction among all actors in the university (students, teachers, administrators), to connect them across disciplines and with external partners (regionally and internationally), and to effectively access and contribute to the world’s accumulated scientific knowledge.

A key challenge for the University of Bremen is considered to be the development and maintenance of a strong and competitive profile among the leading German universities. To achieve this, the emphasis is on the improvement of research and academic teaching; ICT is seen as an important tool, especially for the improvement of teaching.

Necessity is the primary driving force for the integration of ICT at the University of Bremen. It is regarded as having a growing impact on all sectors of society, and in this context the universities must be fore-runners in setting examples of sensible use. According to vice rector Peter Richter, other driving forces for the integration of ICT at the University of Bremen are:

- Technological developments in ICT, and the desire of many actors to take advantage of them
- Government support for ICT-related programmes in research and teaching
A strong commitment by the previous rector J. Timm to supporting ICT

A number of colleagues in the computer science department and other departments who have put a lot of effort into using and developing the technology.

In the 1980s, the university’s computer centre became decentralized, and more or less unconnected policies were developed in various departments and at the administrative level. At the end of the 1990s, the situation called again for centralisation and a combining of the different competing strategies and initiatives into a single shared strategy.

A new and co-ordinated ICT strategy is now being developed at the University of Bremen which will cover the organisational aspects, funding, technological infrastructure, the pedagogical and didactical aspects, the competence development of teachers and cooperation with other universities.

According to Professor Heidi Schelhowe of Digital Media in Education, the integration of ICT is very well advanced in some parts of the university. There are centralized services (the WLAN [wireless local area network] for the whole campus is outstanding), as well as many initiatives and projects in nearly all departments. All departments have decided on multimedia concepts for their teaching activities. Nevertheless, some faculty members disagree about multimedia activities, while others are still hesitant.

It is considered that in the future ICT will be an integrated part of the whole university, both in teaching, research and administration.
8.2. Management, organisation and funding of ICT

Management involvement in the process of harmonisation of the ICT integration

Management is seen as an important driver for the integration of ICT at the University of Bremen. The staff interviewed underline that the management is supporting the faculty initiatives, and that they are perceiving an interest from management in the integration of ICT which they consider to be creating a positive attitude towards ICT. Several staff members note that without a highly motivated and realistic university management there is no future for ICT integration.

The vice rector is very conscious of the management’s role. The vice rector points out that during an early phase in the university’s history ICT was concentrated in tightly managed computer centres. Then there was a phase of creative diversification, with little central management. Currently there is a strong demand for harmonisation, the setting of standards, and the definition of common goals. This process cannot be driven other than by a determined central management. However, the vice rector notes that the management must not be so strict as to suppress the creativity of the various parties, but it needs to mediate any conflicts between them and define a general framework.

Units working with the ICT integration

The integration of ICT at the University of Bremen can be seen as a combined organisational model which integrates both centralised and decentralised elements. It is organised around the Centre for Multimedia in Education (ZMML - Zentrum für Multimedia in der Lehre), which is a co-operatively-run competence centre for instructional technology and e-learning. The following organizational units of the university are members of the Centre for Multimedia in Education:

- University Media Centre
- Bremen State and University Library (SuUB)
- Centre for Applied Information Technologies (ZAIT)
- Centre for Networks and distributed Data Processing (ZfN)
- Centre for Continuing Education (ZWB)
- Media Informatics
- Bremen Institute for Education Research (FB12)
- Institute for Digital media (FB3, ITG-L)
The various organisations cover all the major aspects of the integration of ICT into teaching and e-learning. Each unit is responsible for its corresponding area of expertise. A steering committee containing representatives of the various departments is responsible for the strategic planning.

According to Professor Manfred Wischnewsky, Director of the Centre for Multimedia in Education, the strength of this organisational model lies in its flexibility. The Centre for Multimedia in Education can easily build task forces using the resources of the various organizations. Its highly competent and motivated staff are seen as another strength of the organisation.

The organisational model of ICT at the University of Bremen has developed over time. Several interviewees point to the need to maintain an overview of the whole organization, and the interfaces between the different institutions have to be designed very carefully, so as to avoid destroying the high motivation of individuals.

In an assessment of the organisational model two arguments stand out. On the one side is the democratic structure of the ZMML, which is seen as having been an important driver for the integration of ICT at the University of Bremen. On the other side is it believed that there are now too many committees which in parallel or in succession ruminate on strategies and initiatives without taking decisions or implementing projects. The interviewees call for a new structure to organize all the university’s multimedia activities.

### ICT integration departing in projects, but on the way to be integrated into daily life at the university

Nearly all departments at the University of Bremen are involved in projects on multimedia teaching. At the university there are many and various projects at both national and EU level. National projects supported by the German Ministry of Education and Research are as follows:

- Notebook university.
- WLAN
- Physik multimedial
- Vision 2003: Lehr- und Lernsysteme in der Medizin
- MMISS - MultiMedia-Instruktion in Sicheren Systemen
• PRO-TEACH-NET
• Methodenlehre-Baukasten
• eBUT: e-Learning in der Bewegungs- und Trainingswissens-schaft.
• Gender Mainstream

EU projects:
• IDEELS (Intercultural Dynamics in European Education through onLine Simulation)
• COSIGA (A Concurrent Engineering Simulation Game using Advanced Multimedia and Telecommunication for Education of European Students
• Radio (Remote Action in Distributed Learning Environments)
• DERIVE (Distributed Real and Virtual Learning Environment for Mechatronics and Tele-service)
• BREVIE (Learning Environments for Automation Technology: Development & Evaluation of a Learning Environment for Vocational Training)

Most interviewees believe that the integration of ICT begins in projects, but that the university is well on track to integrate the project experiences into normal operations and everyday education.

Experts such as Erwin Wagner, president of the European Distance Education Network, has pointed to the general problem in German universities of the integration of ICT being project-based rather than grounded in the organisational structure. The director of the Centre for Multimedia in Education at the University of Bremen does not see the fact that initiatives begin in projects as negative per se. For him it is important that the project results should be promising before they are integrated into the routine procedures of the university. However, he does acknowledge sustainability as being a key challenge for ICT integration in general.

The technical infrastructure

The technical infrastructure at the University of Bremen is good. Management, academic and administrative staff all have access to computers at the university. Internet access and e-mail accounts
are available to all groups at the university. The majority of students have access to computers, and there are about 7-10 students per computer. More than 25% of students have a laptop computer, and the number is rapidly increasing. The majority of the students have a PC at home, and about one fourth have either DSL or ISDN access to the Internet.

The University of Bremen is a Notebook University, and there is a wireless LAN (Local Area Network) at the university. The LAN is regarded as working quite well, and the director of the Centre for Multimedia in Education points out that the University of Bremen is a reference university for wireless LAN. Professor Heidi Schelhowe of Digital Media in Education notes that the Notebook University has represented a good approach for integrating ICT, and she considers that many creative and innovative concepts for changing learning and teaching styles will accompany this initiative.

An intranet based on a FirstClass Server has been used by some of the University of Bremen teachers in their courses, in EU projects and in other administrative work (e.g. online scheduling). The same intranet was also used by 450 students studying economics, who passed their semester exams by completing an online test delivered by the FirstClass server. However, for historical reasons there are different intranets and learning platforms being used simultaneously at the University of Bremen. This is now seen as posing a problem, as the different systems are not all compatible. According to the director of the Centre for Multimedia in Education, this problem will be tackled in the near future.

Advanced on-line services are offered to the students. By using smart cards containing an electronic signature, students can for example apply for vacation semesters, supply change-of-address information, or withdraw from the university rolls at the end of their courses. However, several interviewees point to the need for online services to be developed further. The emphasis is now on avoiding isolated solutions and implementing a comprehensive electronic platform which integrates the different developments in teaching, research and administration.
According to Professor Horst Schecker of Physics Education, technical limitations are seen as being less and less important. He considers that a key strength in the University of Bremen’s approach to integrating ICT lies in the combination of the provision of the technical framework (e.g. wireless LAN) alongside the development of the e-learning content in various projects.

**Funding of the ICT development**

The implementation of ICT is significantly funded by government funding and project funding; some funding comes from public-private partnerships, and only to a small degree from the university budget.

According to the vice rector, this funding model was chosen due to necessity and specific circumstances. The German federal government had a policy of generously supporting ICT projects (the New Media in Education programme), and at the University of Bremen a number of professors realised this at the right time and applied for grants. At the same time the federal state of Bremen was in a difficult economic situation (being characterised by a high degree of unemployment, low tax receipts etc.), which led to the more wealthy German federal states feeding money into the Bremen state budget only on the condition that it would be spent on investments in the future, such as the university.

The government funds were a driver for the integration of ICT at the University of Bremen which permitted the university to implement a number of innovative programs. The main obstacle to the continuous integration of ICT is also inherent in this, as the preconditions and time horizon for this funding are limited. The extra funding has enabled the university to start up the process, but has also left it with the responsibility of sustaining further integration with other resources. In the future the university will have to allocate funding from the university budget for the purpose of integrating ICT, but it is considered that this will be very limited in scope.

Funding will be a future challenge for the ICT integration at the University of Bremen. Only limited alternative methods of funding are being considered. Funding comes from private sponsorships and
EU programmes only to a very low extent. As regards private sponsorship, there is no tradition of that in Germany, but the vice rector does hope for sponsorship from large private companies who want students to get acquainted with their products. The University of Bremen has hesitated to enter the new territory of EU programmes out of a fear of bureaucracy, but some efforts are now being made to participate in European programmes. The vice rector does not anticipate that ICT will support the development of new models for the general funding of the university (for example, via an emphasis on selling e-learning courses to private enterprises).

Professor Klaus Jürgen Bönkost of the Faculty of Education notes that the challenge for the university in the future is to finance the fast-changing technology and the staff required. He does not believe that there are ways to save money in the education system.

8.3. The educational setting

The level and quality of ICT used in teaching at the University of Bremen is mixed

In general it is thought that the level and quality of the ICT used in the University of Bremen’s teaching is very mixed. According to the vice rector there are excellent examples in various departments, but there are also some which should not be highlighted. Professor Horst Schecker of Physics Education notes that there are a number of really innovative concepts, but the majority of lecturers are not involved in these. However, according to the director of the Centre for Multimedia in Education, the level and quality does not diverge from that of other universities in Germany.

Different types and combinations of digital learning resources/teaching material are made available to students and teachers at the University of Bremen:

- PowerPoint presentations,
- d-lectures (lectures recorded digitally, linked with the accompanying materials and presented on the Web),
- Supplementary materials are represented as e-books. The concept of e-books allows the integration of all possible multimedia
objects, including simulations. The e-books are based on XML

- Electronic study books containing all the types of document
  which the students collect during their studies.
- Intelligent Computer Based Training programs, e.g. hypermedia
  scripts (‘self-learning units’) with integrated simulations, videos,
  animations, and applets/physlets
- Problem solving tools including simulations, applets/physlets,
  interactive screen experiments, and modelling systems
- Home pages for working groups and various learning plat-
  forms.(However, it is noted that there are currently too many dif-
  ferent platforms)
- Co-operative learning environments supporting such things as
  net meetings with video conferences.

An example of the use of ICT in teaching is the collaborative class-
room server (FirstClass) used by students intending to become
teachers. According to Professor Klaus Jürgen Bönkost of the Fac-
ulty of Education, a virtual learning space was established in an
 electronic conference, and about 50 lecturers now use this elec-
 tronic infrastructure for their lessons. As part of the WLAN and
 Notebooks projects, many of the students have direct wireless ac-
 cess to this server on the campus.

Professor Horst Schecker of Physics Education, believes that the
development of the Notebook University has changed the learning
situation on the campus. More and more students have personal
laptops which they bring to the university and use on campus both
in group work or independently. However, he notes that no major
changes in the lecture didactics have yet taken place., as it is con-
sidered that this will take much longer.

Most of the interviewees think that the integration of ICT is improv-
ing the quality of education at the University of Bremen. According
to the director of the Centre for Multimedia in Education, ICT en-
courages the innovation of courses and curricula. However, Pro-
fessor Horst Schecker of Physics Education points out that such
improvements do not come about automatically. ICT needs to be
 integrated into proper learning environments. Professor Heidi
Schelhowe of Digital Media in Education notes that the implementation of interesting projects with strong effects on the quality of teaching is crucial as a starting point and for creating motivation.

Digital learning resources/teaching materials are being developed by individual teachers as components of projects and in student projects, and also in large teams. For example, Professor Klaus Jürgen Bönkost of the Faculty of Education is developing his own digital learning resources on the collaborative classroom server.

Larger development projects require team effort, and are for instance initiated by the Centre of Multimedia in Education. Teams are made to take on a variety of roles, e.g., project management, subject authoring, instructional design, courseware development, tool development, courseware evaluation or as video and audio specialists. Some of these larger projects are collaborative ones with other universities.

The director of the Centre for Multimedia in Education believes it is very important to develop digital learning resources, because good digital learning resources are lacking. However, the great expense of developing such learning resources is a problem. Therefore the director recommends that their development should be conducted in co-operation with other partners, because it is too expensive for one university working alone. Professor Heidi Schelhowe of Digital Media in Education instead recommends the development of (electronic) space for both the students' own activities as well as common activities.

The issue of pedagogical standards, and technical standards especially, is important if learning resources are to be sharable and reusable. At the Centre for Multimedia in Education, open specifications for facilitating online distributed learning activities are being applied. Both technical and pedagogical standards are being observed in the projects of the Centre for Multimedia in Education:

- ADL-Sharable Content Object Reference Model (ADL-SCORM)
- Learning Object Metadata (LOM)
IMS: The technical specifications of the global learning consortium for interoperability of applications and services in distributed learning environments,

- LTSA (learning technology system architecture) for the development of CBT (in particular level 3), initiated by IEEE Learning Technology Standards Committee (LTSC)
- Results of the European CEN/ISSS and Prometheus initiative.

The pedagogical standards comprise the following areas:
- Engaging and supporting all students in learning
- Creating and maintaining effective environments for student learning
- Assessing student learning
- Planning instruction and designing learning experiences for all students
- Understanding and organizing subject matter for student learning
- Developing as a professional educator

However, several interviewees note that the standards are not generally being observed, as most of the staff members know very little about them or do not consider them to be very helpful.

However, the use of standards can be expected to grow in the future as the infrastructure for exchanging learning resources is developed, which is what is happening at the University of Bremen. An electronic library (e-Lib) is being built for the exchange of documents. The e-Lib is being developed on the basis of the ‘open archives’ international standard. In the near future the University of Bremen will join the ‘Worldwide Universities Network’ (WUN), which fosters collaborative research, exchange and distributed learning among its partners. Most of the learning resources and teaching material are currently shared in connection with the university’s participation in national and international e-learning projects.

The University of Bremen offers only a limited number of courses in e-learning format. Most of these have been developed in cooperation with other universities using existing standards or quasi-
ised as e-learning standards. The cost/benefit relationship is the dominating factor, and the courses represent the capabilities currently possessed by the universities. The e-learning courses are accredited using the ECTS system. Quality assurance is an integrated part of the standardization of learning technology.

Different arguments are given to explain the limited number of courses being offered in e-learning format. The director of the Centre for Multimedia in Education notes the lack of resources for developing e-learning courses as being the main reason. Professor Klaus Jürgen Bönkost of the Faculty of Education points to the ‘academic senate’, which does not want to adopt e-learning. Professor Horst Schecker of Physics Education notes that teachers are used to conventional methods, and are reluctant to change them.

The teachers interviewed are positive towards the use of e-learning for teaching. For example Professor Klaus Jürgen Bönkost of the Faculty of Education has had repeated experience with online courses. He has conducted courses with Russian students in Belgorod and Moscow. He has received very good feedback from his students, who are demanding more such courses. The ones he has experience with are so-called ‘hybrid learning environments’, and he considers this model to be a good one provided the lecturers are qualified in tele-tutoring and have taken a thoughtful and systematic pedagogical approach. However, problems occur when a suitable pedagogical approach is absent.

Students - Skills, interest and incentives to use ICT

The students are very interested in the use of ICT in teaching. According to the director of the Centre for Multimedia in Education, the students expect high quality education which incorporates ICT and blended learning. 70% of the students say that d-lectures improve the quality of teaching, and Professor Horst Schecker of Physics Education notes that sometimes students ask lecturers to make use of e-learning if they have experienced it in other professors' lectures.

However, not all students have the skills necessary for integrating ICT into their curricula and learning process. Increasing numbers of students have computer experience and are confident users, but
they are not necessarily critical users of ICT and may for example not be effective in performing basic searches.

At the University of Bremen, the students are offered free training in the basic use of computers and software. Several teachers also offer special training courses as part of their lectures. Special courses are offered on demand, and there are teachers available to consult and to assist in achieving project goals.

The interviewees see most of the students as drivers for the integration of ICT, but the vice rector notes that while in principle students want to be introduced to the newest technology, in reality they prefer the easiest route towards passing their exams.

**Teachers - Skills, interest and incentives to use ICT**

The staff at the University of Bremen is seen as being of key importance in the integration of ICT. The vice rector praises the competent and highly dedicated staff members who have been drivers for ICT integration, but also acknowledges the inherent bottleneck affecting the staff, who have worked to their utmost to achieve it. Professor Klaus Jürgen Bönkost of the Faculty of Education also notes that it is a weakness that there are too few staff to do all the work. The scientific and administrative work required represents a difficult challenge for the staff, as they have to do the same work as before without any reduction in their teaching workload.

The University of Bremen recommends the other universities in Europe not only to focus on the technology, but also on the university staff. A creative, flexible and highly motivated staff member is more worth than high-end computer components and high-speed internet access.

The director of the Centre for Multimedia in Education believes that all academic staff are familiar with Office programmes such as word processing, e-mail, and the internet in general, but when it comes to integrating ICT into the curriculum only 40% have the good or excellent knowledge of ICT needed to be able to do this, while about 40% have basic ICT skills and 20% are beginners. However, the assessment is that the situation is continually improv-
ing.

The director for Centre for Multimedia in Education believes that the successful integration of ICT into the curriculum depends on teachers being convinced of the relevance of ICT as a means of providing access to a richer range of resources for themselves and their students. Professor Klaus Jürgen Bönkost of the Faculty of Education thinks that most teachers are interested in implementing ICT and e-learning, but that they have to make the right adjustments for their specific situations, whose daily work involves many challenges. Professor Horst Schecker of Physics Education sees a great deal of reluctance among his colleagues and fears that ICT might reduce ‘real experiments’ in physics teaching, for example.

Different incentives are being used to encourage teachers to integrate ICT in their teaching. The integration of ICT is encouraged by ‘innovative’ and ‘good practice’ teaching, and the university of Bremen is systematically training the university staff to use appropriate technologies to enhance and support effective learning using guidelines prepared by the Teacher Education department. At the Faculty of Education it is now possible to reduce lecturing obligations for a certain period if a staff member is developing special applications or exploring new ways of teaching with ICT. In addition, technical and pedagogical support is being offered to the teachers. However, Professor Horst Schecker of Physics Education notes that there should be more incentives, e.g. generally reducing the lecturing load of staff developing and testing ICT-supported lectures.

All the interviewees believe that some teachers are drivers while many are barriers for the integration of ICT. Conservative lecturers and elderly teachers are seen as a barrier for the integration of ICT, but as young professors join the staff the situation is expected to change positively. According to the vice rector, the students have an attitude of waiting, but teachers tend to become drivers when they are provided with the right backing in the form of official guidelines, course requirements and the like.
The interviewees believe that in the future ICT will become an integrated part of higher education in general, and in the University of Bremen in particular. For the future, the director of the Centre for Multimedia in Education foresees an individualization of the learning setting, combined with more co-operative learning. The use of co-operative or collaborative groups to solve problems is a trend in both work and education. The use of problem-based learning (PBL) in schools and universities is becoming more common, and will increase as long as it continues to be practised in business and industry. This model requires particular software containing a tool which - as far as this is individually possible - will support an autonomous and independent type of learning.

Additionally, the director of the Centre for Multimedia in Education believes that in the future teachers will make even more use of ICT for professional activities, including lesson planning and the preparation of teaching materials, recording student assessments and other administrative tasks, and for their own professional development and continuing education.

8.4. Co-operation with other universities, municipalities and private companies

The University of Bremen is dedicated to fulfilling its responsibility towards society, and is co-operating with other universities, the municipality and local companies.

The University of Bremen has a strategic co-operation agreement with the University of Oldenburg and with the other universities in the state of Bremen. In addition, the University of Bremen co-operates strategically with universities in Russia. Beyond this, co-operation is dependent on personal contacts. At the University of Bremen there are some 300 co-operative agreements based on the connections of individual professors. As an example of education-related co-operation, Professor Klaus Jürgen Bönkost of the Faculty of Education uses a so-called collaborative classroom server (FirstClass) in his campus teaching in Bre-
men, and on the same server there are gateways to six schools in Bremen plus ones to the University of Texas in Austin, the Russian State University in Belgorod and the Lithuanian University of Kaunas. The Faculty of Education has completed several online courses with students in Moscow and Belgorod.

The main driver for co-operation with other universities is considered to be having staff with the right connections. The main barrier for co-operation is that of resources. The University must, for example, consider if it is itself going to fund co-operation with Kiev. Professor Klaus Jürgen Bönkost of the Faculty of Education, points out that the process of building up both real and virtual networks is very time-consuming, no matter whether it occurs inside or outside the university, nationwide or trans-nationally.

The vice rector recommends to concentrate the efforts. With some 300 co-operative agreements in existence, he thinks there are already too many for an effective co-operation policy.

Co-operation with public and private partners

At the University of Bremen a community of ‘Friends of the University’ exists which has contributed to improving relationships between the university and the region. The ‘Friends’ began in the early 1980s, and since then a network for co-operation between the university and the private sector has also been formed.

The university now has a flourishing technology park next to the campus.
Co-operation with municipalities and other public partners

At the federal level, the University of Bremen is co-operating successfully with the German Science Foundation and the Ministry for Education and Science. At regional level, the University of Bremen is the only public university (in a strict sense) in the State of Bremen, and as a result the university co-operates very closely with the State authorities. The town of Bremen considers the university as one of its main assets for development in the future.

The vice rector considers that the co-operation between the University of Bremen and the municipality has become excellent following the first ten or twelve years of the University’s existence. However, he notes that the authorities keep a very close eye on how the university is organizing its ICT activities, as well as other matters such as study programmes, examinations and so on.

The main driver for co-operation with the municipality and other public partners is, as always, individual colleagues possessing strong determination.

The vice rector does not think that the role of the University of Bremen in the region will change in the next 2-5 years due to the extended use of ICT. The University of Bremen is the only true public
university in the region, and he does not foresee a change in its leading role. However, he hopes that the development so far will be consolidated in the form of increased coherence within the university, and perhaps among all institutions of higher education.

Examples of co-operation with private companies

Co-operation with private companies is an integrated aspect of the University of Bremen's activities. The vice rector sees the departments which are connected to technology, natural sciences or economics as drivers for such co-operation, and he can scarcely see any barriers to it.

The experiences gained from co-operation with private companies have been very good, and this is expected to continue in the future. However, the vice rector notes that he would recommend a modification of Germany's laws to give both companies and private individuals additional tax breaks when they sponsor a university.

In the next section are two examples of the companies with which the University of Bremen co-operates, plus the companies' assessment of their co-operation with the university:

One example of co-operation: Bremen Briteline GmbH

Bremen Briteline GmbH is a private company that has co-operated with the University of Bremen since it was founded in 1998. Bremen Briteline GmbH and the University of Bremen have set up a joint project to digitize lectures ('d-lectures') and to undertake intellectual co-operation in the field of wireless LANs. Among its other activities, Bremen Briteline has designed, and administers, the broadband network which links the institutions of higher education in the state of Bremen. A strategic partnership exists between the university and Bremen Briteline GmbH, and therefore the University of Bremen has a 5% stake in Bremen Briteline GmbH, just like the other colleges of Bremen.

In order to assure fruitful co-operation between a university and a private company, Bremen Briteline GmbH thinks it is paramount to understand the norms and values of the science paradigm and the corporate system respectively. This is also seen as the main barrier for co-operating with the university. The decision-making processes in
the science sector often seem arcane and not particularly streamlined. Scientists are bound to ‘produce’ knowledge and expect to be rewarded for it by their scientific communities. Companies need to earn money and deliver timely results, or they will be punished by the markets. Fortunately for the Bremen Briteline GmbH company, it had prior understanding of the university system and could understand its responses.

The main drivers and advantages of co-operating with the University of Bremen are considered by Bremen Briteline GmbH to be the exchange of knowledge. The managing director describes the experience of co-operating with the University of Bremen as rewarding, but notes that it has not always been easy.

Bremen Briteline GmbH does not see any ‘best’ model for co-operation between universities and private enterprises. However, as one precondition for co-operation it points to the need for a common understanding about the advantages and the ‘stepping stones’. The risk of frustration is always inherent in the process of joining forces and keeping the momentum going. To reduce this risk, it is essential to maintain communication not just when problems arise, but even more so when the participants feel that their co-operation is going quite well. As a specific piece of advice, Bremen Briteline GmbH’s managing director recommends organising both formal (task oriented meetings) and informal (luncheon dates) modes of communication. He stresses that the development will never solely be driven by ‘friendship’; there also needs to be a task, objectives and agreements concerning processes and expected outcomes. In short: professional project management.

Co-operation with hanke multimediahaus AG

hanke multimediahaus AG is a multimedia agency located in Bremen. Due to stagnation in the company’s traditional markets it sought new ones, and one such market turned out to be e-learning. hanke multimediahaus AG started co-operating with the University of Bremen and the Centre for Multimedia in Education on the development of web-based e-learning in healthcare and the pharmaceutical industry. Additionally, hanke multimediahaus AG also participated in developing e-learning content for Russian universities.
The co-operation with the University of Bremen is assessed as being very positive by hanke multimediahaus AG, since the academic staff with which it has co-operated have been very enthusiastic, competent and quick. The advantage for the University of Bremen of co-operating with hanke multimediahaus AG was being able to guarantee its students contact with local industry through projects and practical experience. For the company, the co-operation with the University of Bremen has been especially interesting, as the university has many years of experience of e-learning, knowledge concerning the ICT and quality requirements of the healthcare and pharmaceutical industries, and also contacts with major companies within the field.

Regarding preconditions for initiating co-operation between a university and a private company, hanke multimediahaus AG points to the importance of both sides trying to understand the approaches and working habits of the other party, as already noted above.

8.5. Outcomes and lessons learned

**Strengths of the university**

The key strengths of the way the University of Bremen has integrated ICT:
- The democratic structure of the Centre for Multimedia in Education
- Active support from the management of the university

**Weaknesses of the university**

The key weaknesses of the way the University of Bremen has integrated ICT:
- Too little time and too few incentives for staff to integrate ICT

**Main drivers for the integration of ICT at the University of Bremen**

The main drivers for the integration of ICT at the University of Bremen:
- The most important driver is enthusiastic staff members dedicated to integrating ICT
- Funding from the federal government programme
### Main barriers for the integration of ICT at the University of Bremen

The main barriers for the integration of ICT at the University of Bremen:

- The process of integrating ICT takes a great deal of time and effort from those involved, and when this is added to everyday tasks it rapidly becomes too stressful
- Reluctant lecturers
- At present, there is a strong demand for harmonization, the setting of standards, and the definition of common goals. The existing decentralised organisation structure cannot deliver this. There is now a need for a determined central management.
- Limited funding when the university has to fund its own ICT integration

### Recommendations from the University of Bremen to other universities in Europe

Special recommendations from the University of Bremen to other universities in Europe:

- Do not only focus on the technology, but also on the university staff. A creative, flexible and highly motivated staff member is more worth than high-end computer components and high-speed internet access.
- When starting up, the implementation of interesting projects with a significant impact on the quality of teaching is crucial for motivation

### 8.6. Sources and links

**Interviews with management**
- Vice rector for teaching affairs Dr. Peter Richter, Professor of Physics

**Interviews with representatives from the ICT organisations**
- Professor Dr. Manfred B. Wischnewsky, Director of the Centre for Multimedia in Education, Mathematican and computer scientist
- Professor Dr. Heidi Schelhowe, Head of Digital Media in Education, Department of Computer Science
Interviews with academic staff
  • Professor Dr. Klaus Jürgen Bönkost, Faculty of Education and Centre for Digital Media in Higher Education
  • Professor of Physics Education Dr. Horst Schecker, Department of Physics and Electrical Engineering

Interviews with private sector partners
  • Wolfgang Schmidt, Co-owner and Managing Director, Bremen Briteline GmbH
  • Frank Drecoll, Leitung eLearning, hanke multimodiahaus AG

Contact information for the University of Bremen
  • Universität Bremen
    Bibliothekstraße 1
    D- 28359 Bremen
    Telephone: +49 421 218-1

University of Bremen website
  • The University of Bremen website: http://www.uni-bremen.de

Strategy papers
  • A committee on the organization of ICT (‘Rechner-Organisations-Kommission’) exists at the University of Bremen. The committee is currently developing a strategy to combine the various strands of activity.

Examples of projects involving ICT
  • Physik multimedial: http://www.physik-multimedial.de