

THE VIRTUAL UNIVERSITY

Models &
Messages

Lessons from
Case Studies

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Universitat Oberta de Catalunya (UOC), Spain

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A newly created institution



United Nations
Educational, Scientific and
Cultural Organization



International Institute
for Educational Planning

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List of abbreviations

EDIUOC	UOC publishing house
ICDE	International Council of Distance Education
ICT	Information and Communication Technology
IN3	Internet Interdisciplinary Institute
TP	Training Plan
UNESCO	United Nations Educational, Scientific and Cultural Organization
UOC	Universitat Oberta de Catalunya (Open University of Catalonia)
VC	Virtual Campus

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1. Universitat Oberta de Catalunya and its context

1.1 International context

The Universitat Oberta de Catalunya (UOC, Open University of Catalonia) was created in 1995 with the idea of it becoming a global university rooted in a local context. This was the main reason why the UOC started its activities at the regional level, in Catalonia; further, establishing the university at this level made it easier to monitor its early development.

Some time after, in 2000, the UOC started focusing its services on the national market (Spain) and then expanded them to the international Hispanic market.

Finally, in an attempt to fully carry out its global vocation, the UOC's next step is to enter the international space of other languages.

The UOC therefore belongs to a number of international associations and participates in several international forums, contributing from its experience to broaden the knowledge about how virtual teaching and research universities could be, or should be, managed. Examples of this include UOC's affiliation with the ICDE (International Council of Distance Education), European Distance Education Network, Centro Internacional de Desarrollo Universitario and the Latin American Network for Distance Education. In addition, the UOC belongs to all the Spanish associations, networks and consortia related to its activities.

1.2 National context

Although it is part of the Spanish Kingdom, Catalonia has an autonomous government, the Generalitat de Catalunya. With a different language – Catalan – and different cultural traditions, Catalonia is a diverse and welcoming society. Its territory has become a historical melting pot due to its strategic situation, being the Spanish region closest to the rest of Europe and playing a very important part in maritime commerce in the Mediterranean Sea.

Far from presenting a problem, Catalonia's two languages (Catalan and Spanish) are spoken by the majority of Catalan people. As a result of migratory movements, many people from different Spanish regions live in Catalonia and are fully integrated. Catalan is understood by 99 per cent of the region's population and 100 per cent can speak Spanish.

Until the creation of the UOC in 1995, the Spanish National Distance University was the sole distance education provider in Catalonia. However, Catalonia has a rich tradition of quality, higher-education institutions. A number of conventional universities can be found in the region, such as the Universitat de Barcelona, the Universitat Autònoma de Barcelona and the Universitat Politècnica de Catalunya. More recently, the Universitat Pompeu Fabra has been created, and regional universities, such as the Universitat Rovira i Virgili, the Universitat de Girona and the Universitat de Lleida have gained their independence. Moreover, in 1990, private universities were permitted in Spain, and the Universitat Ramon Llull, the Universitat Internacional de Catalunya and the Universitat de Vic started their activities. Nevertheless, none of them offered any real distance, or virtual, education programmes.

In order to find some past distance education experience in Catalonia, it is necessary to go back to the 1930s, when the Mancomunitat de Catalunya created the Extensió Tècnica Professional. That was a classical correspondence education programme, focused on vocational studies.

In 1999, the Catalan government presented a plan called the 'Digital University', which aimed to facilitate the initiatives of universities in this field. As a result, an experiment of sharing courses in the same virtual space was conducted by the government.

Far from limiting its activities to this environment, the UOC started to offer its educational programmes to all Spanish regions in 2000. Immediately, the demand from Latin America led the UOC to implement a strategy for offering these programmes more globally, starting with the Ph.D. programme on the Information and Knowledge Society.

2. The creation, organization and current programme of the Universitat Oberta de Catalunya

2.1 Creation

The Universitat Oberta de Catalunya is a fully accredited distance education university that was established in January 1995 by the Catalan government. Its headquarters are in Barcelona, and it has developed in partnership with key stakeholders in Catalonia, from both the public and private sectors. It was designed to complement the Catalan university system, making university studies available to all members of society who, because of work, place of residence, age or other personal factors, opt to enrol in more flexible courses. The objective of the UOC is to provide the highest quality university education based on distance learning – delivered via the latest information technologies – to Catalan students anywhere in Catalonia and to students throughout the world.

In the past few years, there has been a growing awareness of the necessity to base education not only on face-to-face interaction between the teacher and the student, but on different educational models that can respond to different needs. In Europe, and throughout the world, a new educational paradigm is being consolidated, one that is adapted to a new society, and changeable and diversified in terms of the student's age, activity, economic level, place of residence and personal situation.

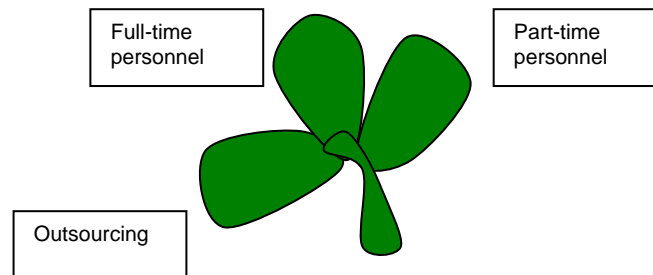
The UOC was created to respond to this new situation and fulfil these new needs. This response is based on a flexible and open educational model, which takes advantage of the possibilities that information society technologies offer, and uses these as support tools.

With regard to the educational services of the conventional universities in Catalonia, the UOC was conceived from the very beginning as an effective and efficient alternative, providing distance higher education with the following characteristics:

- a commitment to being rooted in the cultural, social and linguistic reality of the Catalan country and open to the world;
- to make knowledge available for everyone, despite time and space constraints;
- a special focus on lifelong learning;
- the use of high-quality and innovative teaching and learning models;
- the intensive application and use of new communication and information technologies;
- a commitment to research and development in the emerging information society;
- serving students and society;
- agreement of cooperation and co-ordination with the Catalan university system;
- an ethical commitment to society; and
- a new organizational model for a new type of university.

UOC's educational model is based on an innovative teaching and learning system, which encourages students to become part of the university community as a way for them to communicate with others and learn. Students thus acquire knowledge not only through what is taught to them, but also by interacting, working and cooperating with different members of the university community.

Figure 1 The Human Resource organizational model



2.2 Organizational structure

The UOC was not organized as a traditional university, but as an e-university that can be agile, flexible, competitive and cooperative all at the same time, and has a vision of the future as an opportunity to innovate and to improve the university system. Its legal status is that of a non-profit private foundation, with the Catalan government as its main trustee. Other important trustees are key stakeholders in Catalan society, including the Chamber of Commerce, the Savings Bank Consortium, the Catalan Broadcasting Corporation and a number of publishing companies. On the basis of proposals made by the trustees, the Catalan government appoints the university Rector.

As mentioned, the UOC structure is altogether different from the organizational concept and working style of traditional universities. While the UOC is a state university in terms of fees that students pay, it is, at the same time, a private undertaking which needs to be internally organized more as a private company than as a traditional higher-education institution. Different areas of the UOC are thus structured in different ways, using different models. In the area of human resources, for instance, the university has adopted the following 'shamrock' model (Figure 1) to obtain a balanced human-resource structure.

As the university was being newly created, it chose a new form of management and organization: a model based on a Process Management System, the European Foundation for Quality Management¹ model, and structured to be able to respond directly to fulfilling student needs.

The UOC applies this management model to three areas:

- Strategic
- Educational programmes
- Operational

The university has adopted this model in order to achieve the following main objectives:

- increasing a client-oriented philosophy;
- avoiding barriers to horizontal communication;
- generating systems so that staff can participate more in the success of building UOC as a virtual university;

¹ <http://www.efqm.org>

- improving internal information and communication systems;
- promoting quality assurance along all processes.

The UOC opted for a Product Management System because:

- it is a non-bureaucratic management system;
- it implies agile co-ordination;
- it generates an environment that fosters participation and involvement of staff;
- it allows to ensure communication on the work-flow;
- it facilitates the integration of client and market-place voices;
- it facilitates continuous improvement procedures;
- it allows to achieve a model of excellence.

For this process to be useful to the institution:

- it must be updated;
- it must be public and collective;
- staff must periodically examine their mission and meet requirements;
- management must be evaluated periodically so that improvements can be implemented.

A high level of continuous self-assessment for best quality assurance is necessary.

Staff development

For all the above reasons, the structure of the UOC faculty and staff is different from that of a conventional public university. The UOC structure aims to allow for agility and flexibility and, at the same time, meet the need for a very professional and highly client-oriented staff.

Through its Human Resources Department the university has set up a Training Plan (TP) for UOC staff that includes three kinds of training. The university is conscious that a TP must be flexible, wide in range and open in order to be able to respond to new educational needs that arise as the university evolves over the years. The TP covers different fields of knowledge depending on the training that is needed by the organization. The catalogue of internal training specifies these activities, the departments for which the courses are intended, and the requirements that need to be met in order to apply for the training. The programmes are divided into:

- professional development;
- abilities and techniques;
- training new UOC staff; and
- languages.

The different modalities of the TP can be classified into:

- *Internal training:* This is training that has been specially designed by the UOC for staff members who share the same technical or organizational needs. The university offers two kinds of internal training: training that is destined for a specific group, and training that is open, available to everybody. The university covers the training costs and these are charged to the training budget. Training takes place during working hours.
- *External training:* This training is organized by other institutions and offered to UOC staff. These kinds of courses are usually very specific with regard to the subject matter

Table 1 UOC programmes and courses by discipline

Programmes/courses by discipline	Number of complete degrees	Number of programmes/courses
Humanities	2	130
Social sciences*	11	160
Health sciences	0	5
Engineering	4	92

* Includes Business administration, Education, Law, Psychology and Information Sciences

Source: UOC internal documents.

and the number of people who are concerned. This is the reason why the UOC does not organize these training activities.

The Training Programme also participates in certain professional activities, such as seminars, congresses, exchanges with other institutions and workshops. In order for staff to participate in these activities, they must be relevant to present or future responsibilities of staff and be approved by their supervisor.

2.3 Current programme

Despite starting with only 200 students enrolled in two complete and accredited degree programmes, the UOC has managed to increase these figures considerably over the years. New disciplines have also been added in response to the new demands of a changing society and at present the UOC covers all the different levels of the Spanish university system (undergraduate, graduate, postgraduate, continuing education and doctoral programmes). UOC offers a total of 135 programmes/courses. Over 60 per cent of these are a part of the postgraduate degree and continuing-education (specialization) programmes.

The main current figures for UOC² programmes are given in Table 1. The number of students enrolled in accredited degree programmes during the September 2002 to January 2003 semester was 19,735. If students enrolled in continuing education are added, the figure is close to 22,000 students. The degree with the highest enrolments is business administration with nearly 5,000 students, followed by computer engineering (2,500 enrolments). Eighty-three per cent of students are between 25 and 45 years old. The UOC student body is composed of 45 per cent females and 55 per cent males.

Average course completion rates

Due to the specific structure of curricula and accredited study programmes in Spain, the concept of 'course' as it is used here should be clarified. Each degree programme is composed of a number of subject courses. These courses do not constitute the degree as such, but upon their completion students receive a certain number of credits that they need in order to obtain the final degree.

² All figures are related to the academic period September-February, 2002-2003.

Table 2 UOC support staff by function

Function	Number of staff
Strategic directors	6
Operational heads	25
Technical support	250
Administrative support	117
Total	398

For this reason, average university-level course completion rates in UOC are related to the completion of subject courses at the undergraduate level. Each course lasts a semester. Assessment of student performance is based on different assignments that students send to their professors. At the end of the semester, they take a final face-to-face examination and receive an average mark.

Keeping this in mind, on average 82 per cent of the students who take the final examination at the undergraduate level pass it. On the other hand, of the total number of students registered for each subject course, 65 per cent pass the final examination on average.

Academic staff

There are 1,170 faculty members at UOC: 65 per cent hold a master's degree and over 30 per cent have a Ph.D. The breakdown of staff members by function is given in Table 2.

Lessons learned

Despite the difficulties associated with creating a new institution, starting up a virtual university is an initiative wholeheartedly recommended. An important point to keep in mind when considering such a project is that it provides the opportunity to formulate a new policy for a different type of university, one that will not be burdened with the inertia of old institutions.

Another important aspect to consider is the identity of the university. It is often believed that with the development of a global approach for trans-border education, a university's special identity no longer matters. On the contrary, the author believes that it is important for the university to be strongly committed to the region where it is located, and that a high component of the university's identity should be related to its region. Even if it is going to be virtual, the university needs to be strongly rooted in the rational and specific characteristics of its initial users.

A virtual university should not be organized like a conventional one. This is not only because it is going to be more technology-driven than a classical university, but also because it offers the opportunity to develop a new educational model that is more student-centred and more responsive to the current demands of society. The UOC is a good example of such a different organization, one that tries to respond to these particular and new needs. However, this type of university requires almost constant change in organizational terms, and this is sometimes perceived negatively, as creating a burden of anxiety and concern.

The UOC programme is oriented towards providing what society is currently demanding of the university system. This is the reason why the UOC does not offer the whole range of different subject areas and courses, and concentrates its offer on those courses and specializations that are most in demand, trying to offer what the conventional university system cannot. There are still people today who cannot enrol in a conventional university because there is not enough room to accommodate them.

Despite being primarily focused on the Catalan context, the organization of the UOC has been capable of meeting the demands of the Spanish market and it is starting to focus on the Latin American one. This local-to-global approach has thus been one of the key points in the history of the university.

3. Administrative issues

3.1 Administration

The UOC is a private entity with the vocation of a public service, and it is part of the university network of Catalonia. For this reason, the main administrative issues are basically the same as those for other universities in Spain.

The biggest issue the UOC needed to manage was its virtual character, and the underlying philosophy of permitting students to undertake all their studies from home. Keeping this in mind, a comprehensive study was conducted to analyze how an administrative organization for running a virtual university could be developed.

Going much beyond the simplest aspect (i.e. enrolling in courses from home) that the administration of a virtual university has to address, a long list of issues was studied, such as developing a work-flow tool to control the elaboration and production of teaching materials, their delivery to the students' home, and managing the economical transactions between students and the institution and also between professors and the institution.

At present, there are a number of applications that can help the organization handle the administrative aspects in an easier and more efficient way. Some were developed in-house and some were bought externally.

The relationship between the UOC and its students with regard to administrative matters is almost perfect. For instance, students can consult their own academic record from home, in real time, whenever they want or need, and a back office will answer any questions they may have within 48 hours.

Some tools have been developed to help faculty create new teaching materials (GEPP and ARM).³ In addition, the economic management of the UOC is being renewed to facilitate the relationship between the Business Department and the rest of the organization.

It is important to highlight that as the university has grown, some new administrative and organizational units have become almost independent, in some instances becoming separate companies. Thus, the UOC has given rise to a new publishing company⁴ and a multimedia producer⁵, both of which maintain a mutually beneficial relationship with the university through outsourcing.

3.2 Costs and financing

The financial aspects of the UOC are controlled by the Catalan Parliament, as established by law. Therefore, despite being a private university, the UOC has become the most transparent

³ GEPP is a tool for managing the whole publication process of teaching materials. It acts as a work-flow tool which tries to keep all the different players informed of the different steps of the process. ARM means 'Methodological Resources Assistant' and its function is to help authors to build pedagogically-based materials, even if they have no experience in the pedagogical field.

⁴ EDIUOC (<http://www.ediuoc.es>)

⁵ EURECAMEDIA (<http://www.eurecamedia.es>)

public institution in Catalonia and Spain. This is not intended, of course, to cast any doubt on the other Spanish universities; it is just a fact.

Investment

A very important part of the investment budget is dedicated to course production. Over the past six years, the UOC has invested more than 2.8 million euros in developing new multimedia teaching materials, representing the core of its provision (this sum includes all authoring and production costs).

In order to move into Spanish-speaking markets beyond Catalonia, the UOC has entered into a partnership with a publishing company, which has provided an investment of 15.2 million euros. As no public funds will be made available for this, the initiative will have to be financed by fees.

UOC research is funded by agreements with private companies and Public Administration government programmes (Catalan, Spanish and European), mainly through Research & Development programmes. Some companies (Telefonica, IBM, Hewlett Packard) are contributing to UOC research programmes by sponsoring academic chairs, web sites with information databases and reports and research projects.

Income and pricing

Public grants for its activities in the Catalan language make up about half of UOC's income. Student fees contribute a third. The university makes up the difference through revenue from consultancy services, managing other programmes, transferring its model to other universities and assessing other institutions.

Of total expected income of US\$30.5 million in 2003, 52 per cent is expected to come from the Catalan government and 44 per cent from student fees.

By law, Catalan-speaking students who enrol at UOC pay official public university fees, as they would at any public university in Catalonia; they are thus partially subsidized through a Contract Agreement that the university has signed with the Catalan government.

The revenue structure for Spanish-speaking students is quite different. Income from fees they pay is expected to reach close to 44 per cent of the university's total income in 2003. The remainder will be funded by both academic and commercial activities of the university (publications, projects, etc.). It must be taken into account, however, that the Division that deals with the Spanish-speaking market has been in existence for only three years, so it is difficult to make a thorough analysis of its results.

The cost structure for students from Catalonia, and subsidized by the Catalonia government, is based on six modules per academic year (two semesters). That is, a three-year programme for the first degree, and two years for the second degree.

The student pays an average annual fee of US\$400. This includes US\$200 in subject credits, US\$82 in content materials and US\$100 in support services. For students outside of Catalonia, the full cost is charged. This is approximately three times the subsidized price. The average cost per student is expected to reach approximately US\$1,800 in 2003, out of which nearly US\$950 is the average subsidized amount from both the Catalan government and local organizations.

Due to the funding agreement between the UOC and the Catalan government mentioned above, Catalan students who enrol at the UOC pay the same fees as they would at any public university in Catalonia. On the other hand, students from outside of Catalonia have to pay the complete fee, without the benefit of subsidies.

3.3 Technological infrastructure

The Campus VirtualTM, which was developed by the Information Systems Department at UOC, is an Internet-based e-learning delivery and support system. It uses a client-server web technology and common interface to integrate a series of services and applications. All functions of the Campus VirtualTM are applications that have been designed to provide an efficient environment for tele-cooperation and e-learning.

The Campus VirtualTM software is made up of a series of functions that reproduce the structure of a traditional university. These include:

- access to online educational materials, library resources, general academic and cultural information;
- a student management enquiries service; and
- interaction with professors and other students through pre-defined communication channels (e.g. forums, activity spaces, etc.).

In order to foster the sense of a real educational community, the Campus VirtualTM creates a widely shared learning space in which students can interact with the community from their homes. They can receive personal attention; interact with their classmates, counsellors and tutors; gain access to university services; take part in virtual work or debate forums; and have the opportunity to come into contact with the web's extensive university scientific and cultural community.

Campus VirtualTM uses the IDEASolutionsTM platform, which was also developed by UOC. The continuous assessment and development of this platform has allowed UOC to build up a market product that can be adapted to a number of educational contexts. As such, it is of real interest to other institutions wishing to provide virtual university services.

The main characteristics of the IDEASolutionsTM, a start-up company and also the registered trademark for the platform, are the following:

Usability and modular structure

IDEASolutionsTM has been designed specifically for e-learning through the Internet. The tool allows the creation and management of complex training programmes geared towards study, subject areas, and learning modules.

It is designed to be an ergonomic, intuitive, easy-to-use environment for students, professors, managers, and administrators.

The IDEASolutionsTM administration tool aims to be flexible enough to manage learning environments across a range of company or departmental contexts, and has a customizable interface. It is also language independent.

Based on market standards

IDEASolutions™ is installed over Oracle Database, Oracle Application Server and Netscape Web Server. It has been developed with the most frequently used programming languages on the market and uses Transmission Control Protocol and HTTPS⁶ Internet protocols. It is adaptable to the Instructional Management Standard for the management of training programmes.

Open platform

The platform aims to provide a scalable, robust, and secure environment that allows for growth as the organization increases the number of students, professors, managers, and courses on-line.

IDEASolutions™ has an Application Programming Interface that allows the integration of external applications within the tool, and standardizes access to the database.

It has a customizable graphic user interface and also allows the input of various types of teaching materials.

Integrated applications

IDEASolutions™ features the following integrated applications:

- *Electronic Messenger Service*: E-mail engine with message monitoring system (sending, reading, re-sending, erasing, etc.).
- *Training Spaces (courses and modules)*: Includes communication tools (forums, debate, trainer bulletin board).
- *Chat*: Dialogue or conversation among many users in real time.
- *Administrator*: Environment manager for student registration and privilege assignment for registered users. Administrator is also used for teaching program configuration.
- *Content Management*: Application for input and output of content information and teaching materials (HTML, images, texts).
- *Shared Disk*: Application for remote file input and output.
- *Resources Manager*: Multimedia teaching resources database that allows searches according to pre-established criteria.
- *Directory*: Search engine.
- *Help Module*: Help application.
- *Favourites Module*: Allows users to alter settings for language, messenger service system presentation, password, enabling/disabling graphics.
- *MIS Module*: Integration of external applications.
- *On-Line User Monitoring*: Allows real-time identification of the users connected to the environment in order to establish conversations.
- *Bookmarks*: The user can set and manage preferred URL-links.
- *Work Groups*: Enables the user to use specially created privileges, e.g. creation of temporary work groups from user-lists.
- *Additional Components*: Self-managing multimedia resource manager, training catalogue with all training programmes offered, job search service, and publications manager.

⁶ A version of HTTP (HyperText Transfer Protocol). HTTPS enables the secure transmission of web pages.

Software architecture

IDEASolutions™ software is structured through layers and modules. The modules implement the user functions (messenger service, personal disk, chat, etc.) and the additional applications (publications manager, help module, training programme catalogue, multimedia resource manager). The layers interconnect the modules, control internal and external data transmission, and give support to transversal user services (e.g. graphic interface, integration of external applications through an Application Programming Interface, access control, and security).

Hardware and communications architecture

The system uses one or more SUN servers connected to the Internet. Connections are made through the basic telephone network, ISDN (Integrated Services Digital Network), GSM (Global System for Mobile Communications) cell phones, cable and ADSL (Asymmetric Digital Subscriber Line), among others (Figure 2).

The system can therefore be accessed in remote environments, requiring only an Internet connection and a browser.

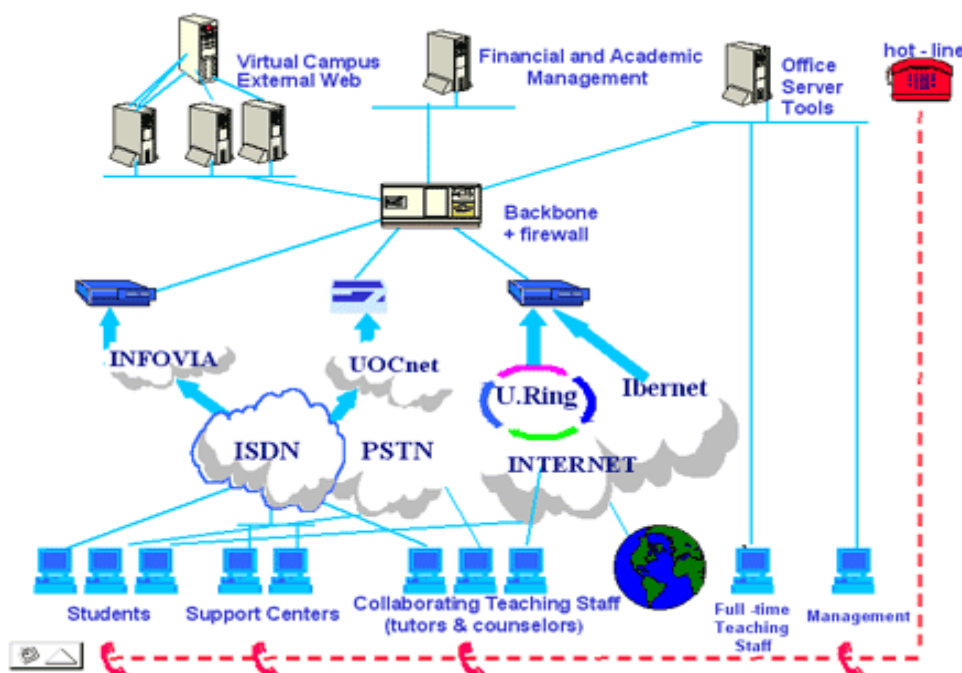
Server system requirements:

- SUN-based server system;
- SUN Solaris operating system;
- ORACLE database;
- NETSCAPE web server; and
- ORACLE web application server.

Communications requirements:

- Connection to the Internet with recommended minimum average capacity of 4 Kb/s per connected user.

Figure 2 UOC system diagram



Client system requirements:

- Pentium-based personal computer with 32 MB RAM (Random Access Memory), 1.2 Gb hard disk. Windows 95 Operating System or higher;
- Internet Navigator; and
- Connection to the Internet with minimum 28 Kb/s.

3.4 Intellectual property ownership and copyright

The university owns the copyright of the products and services it offers and generates. Rights are always demanded when necessary, e.g. for contracting authors or course developers, for the use of images or texts within UOC materials, etc.

Course-material authors retain the intellectual property rights, but they sign an agreement with the UOC, which gives the university permission to manage these rights for a given period of time (i.e. ten years). Authors also receive compensation when these materials are used by a third institution or company with the permission of the UOC. In order to better manage the large amount of information and many tasks such an undertaking entails, the UOC created its own publishing company, EDIUOC (as mentioned before), which has become an active player in the publishing world and also acts as a copyright management agent for the university.

As an educational institution, the university is free to use certain types of information, such as free online documents and images, if this information is used within a password-protected university Intranet. The learning material posted on the UOC site, however, has obtained all required permission to be published in this way and under these conditions.

Lessons learned

The idea of building a virtual organization was always kept in mind when addressing administrative issues. Students must have the possibility to meet their needs by using the ‘virtual campus’, that is, they should be able to access a complete range of student services from home.

For some years to come, virtual universities will be subject to particular scrutiny. Some people think that these initiatives are merely a new attempt at finding ways to do business. Others do not believe in the capacity of online teaching and learning to deliver good-quality education and training. The UOC is committed to offering a good-quality education and also to maintaining a reasonable relationship between costs and benefits.

At present the UOC is achieving good academic results at lower cost compared to conventional universities in Spain. Transparency is one of the key issues for the university. Developing a high level of confidence in the UOC’s practices and activities is needed to demonstrate that these may hold unlimited possibilities, even when they are combined with other, conventional practices.

UOC has developed its own Internet-based e-learning delivery and support system that reproduces the structure of a traditional university: access to educational materials, library resources, general academic and cultural information; a student management enquiry service; and the interaction between professors and students through several pre-defined communication channels.

The reason for creating this technological infrastructure was that in 1994 no appropriate tools to build what we had in mind were available. Today, we are using a number of commercial software applications and tools that can be linked to the basic UOC platform because we think it is important to avoid reinventing the wheel.

Finally, managing intellectual property ownership and copyright is still an open issue for the university. At the beginning, the UOC set out to directly manage its relationship with authors of learning materials. Later, it decided to create a publishing company to improve this relationship, which it has. There is now more flexibility and a greater concentration of tasks.

4. Academic issues

4.1 Programme development

The basis for creating the UOC was to provide an education that would be complementary to what the university system of Catalonia had to offer. The UOC hence developed curriculum areas that are increasingly in demand but that conventional universities are not proposing in sufficient quantity to meet this growing demand.

On the other hand, the UOC is targeting its offer on students who are preparing second-cycle degrees, which means that they have already obtained a first-cycle degree, as is customary with the Spanish education system.

Curriculum areas

Currently, the curriculum areas that the UOC offers are in:

- business administration;
- law;
- psychology and education sciences;
- humanities and languages;
- computer sciences;
- information and library sciences.

Accreditation

All UOC programmes are accredited by the Spanish Government, except those related to 'continuing education', which are accredited by the university itself.

Admission requirements

Students interested in studying at the UOC need to meet all the official requirements for attending any university in Spain. However, access to a great variety of non-credit courses is open. The UOC promotes an interdisciplinary approach, which is reflected in its study plans and the structure of its curricula. Students can choose from a great variety of optional courses when they are working towards their degrees, even in other fields of study, which makes their university experience both easier and more motivating.

Since the UOC is not a conventional university, it is important to consider the particular nature of its student community, which consists primarily of adults. Most UOC students are between 25 and 45 years old (82 per cent), most of them work (93 per cent), and four out of ten have children. Moreover, 65 per cent have already received a university education, so most of them are experienced students. For these reasons, the UOC is currently promoting a project that aims to make recognition and accreditation for learning acquired through experience possible.

Student profile

The profile of a UOC student is that of an adult; 93 per cent of students are working and 77 per cent have previous university experience. Therefore, they can complete the degrees in the same time that full-time students at a traditional university do. At present (eight years after

UOC was founded) the first batch of 200 enrolled students has already finished or is in the process of completing their degrees. However, for the continuing education programmes at UOC the picture is quite different. These shorter courses are more market oriented, with a dropout rate of only 15 per cent and a high level of student satisfaction, and companies have recognized their value. The UOC considers that these are interesting indicators of success for the future, considering that the university has been in existence for such a short period.

Quality assurance and control measures

Providing services with a high level of quality has become a fundamental principle in the public sector in general.

Systematic quality evaluation is an essential method which ensures that the objectives and goals of institutions are being met. The UOC – as part of the Catalan public university system – should be in the forefront of applying quality evaluation systems as internal self-improvement mechanisms to better meet the needs and requirements of its students and society in general. The Agency for the Quality of the University System⁷ in Catalonia coordinates and maintains educational standards for all universities in the country. It is in charge of setting and maintaining quality standards for teaching in all the Catalan universities. As there is no similar agency for the supervision of distance universities, the UOC is working with the Agency to establish indicators for measuring quality in a virtual learning environment.

Quality evaluation means a permanent definition of the prioritized objectives set by the institution (within a limited resource environment), a clear expression of the results obtained and, ultimately, the evaluation of the degree of satisfaction of its clients or those who receive the services offered by the institution.

Quality evaluation at the UOC

Quality evaluation at the UOC has the following goals:

- to promote internal self-improvement within the institution;
- to better fulfil student needs and requirements and to evaluate student levels of satisfaction and their perceptions of the services received;
- to validate the UOC's specific pedagogical system and innovations that are periodically introduced.

To achieve the above goals it is important to know what the students think, for student opinion plays an important role in the functioning of the university. Students can make suggestions and consult services that are offered through the different mailboxes and forums that make up part of the virtual campus. A survey is conducted at the end of each semester in order to gather student opinions and improve the quality of UOC studies and services. Tutors and counsellors are also mainly assessed through this survey, in which students evaluate their teachers' dedication, ability to solve problems, level of knowledge of the subject taught, ability to encourage students to work together, and attention paid to student questions and needs.

In addition, the virtual campus and the UOC itself are evaluated by means of surveys and open forums of debate, as follows, conducted and evaluated by UOC.

⁷ <http://www.agenqua.org>

- *Surveys*: answered by all members of the UOC community (faculty, students, management staff, administrators);
- *Open forums of debate (suggestions, new proposals, complaints etc.)*: everything is taken into account in order to evaluate the state of the university and identify possible improvements.

In general, information and results from the following sources are used when preparing the evaluation process:

- *Statistical information*: student profile, class-load, use of the virtual campus, academic results, etc. Internal evaluation (student surveys): carried out once a semester, which include questions on the teaching process and staff, study materials, virtual campus, academic administration and university services.
- *External agency report*: qualitative study carried out periodically by independent organizations, which survey random samples of students, teaching staff and degree recipients (at opportune times).

4.2 The teaching and learning model

One of the particularities of the UOC is its advanced pedagogical model based on the set-up of the first virtual campus to interconnect university students, professors and central services all over the country.

One of the UOC's main principles is overcoming time and space barriers in order to offer students the highest possible degree of flexibility when they are carrying out their studies.

To understand this principle it is necessary to analyze how the various education systems presently work in society according to time and space variables. Four different situations are presented here, each combining different methodologies and technologies for optimal effectiveness:

- Activities taking place on a traditional campus, where participants must coincide in time and space as these activities are based on face-to-face relations. Although face-to-face teaching is interactive, immediate and personalized, it also lacks flexibility because of time-and-place constraints.
- Tele-training activities, in which participants are in different places but coincide in time. Here, immediacy is possible but there is neither interactivity nor personalization.
- Resource centres, where participants are required to coincide in space; however, participants can go there at different times, which means that, in this case, there is no interactivity, immediacy or personalization.
- Activities in virtual environments, which allow for flexibility in time and location of participants, and are interactive, immediate and personalized.

The UOC organizes its activities in a virtual environment – the virtual campus platform – which allows students and professors to participate in learning, social and communication activities from their homes and at any time during day or night.

Even though on certain occasions specific (but not compulsory) activities can coincide in time (i.e. chats), in space (i.e. consultation of materials at a study centre) or in both time and space (i.e. attending meetings twice every semester), the UOC is developing a completely asynchronous model (Ferraté, 1997). This is because of the profile of its students. As most of

them work, it is difficult to make them coincide with each other at a specific time or place. Total asynchronicity will make it possible to increase the flexibility of the UOC educational model even further.

The UOC faces an important challenge as it develops a new concept of the pedagogical model: for both teaching and learning. The teacher is no longer a mere transmitter of knowledge, but instead he or she becomes a guide in the learning process, for which the student is ultimately responsible.

Traditional universities are beginning to realize the advantages of new technologies, and how distance higher-education institutions are making use of them. As a result, the number of institutions using distance learning models will increase, but they will apply these new technologies in their organizations in different ways, which will lead to different models, focusing on three main variables: the student, the faculty and the technological media. From this point of view we can talk of three possible models (Sangrà et al., 1999):

- media-centred models;
- teacher-centred models; and
- student-centred models.

Media-centred models focus on the technological tool used. The teacher becomes a mere provider of content. The students are the users of this content whenever and wherever they require it. Technology takes over the role of transmitting knowledge and facilitating the assimilation of this knowledge proportionally.

Teacher-centred models are classical in the sense that they focus more on teaching than on learning, with teachers being the only transmitters of knowledge and using new technologies essentially to expand the scope of their lessons. Usually, this does not imply any change in the educational pattern.

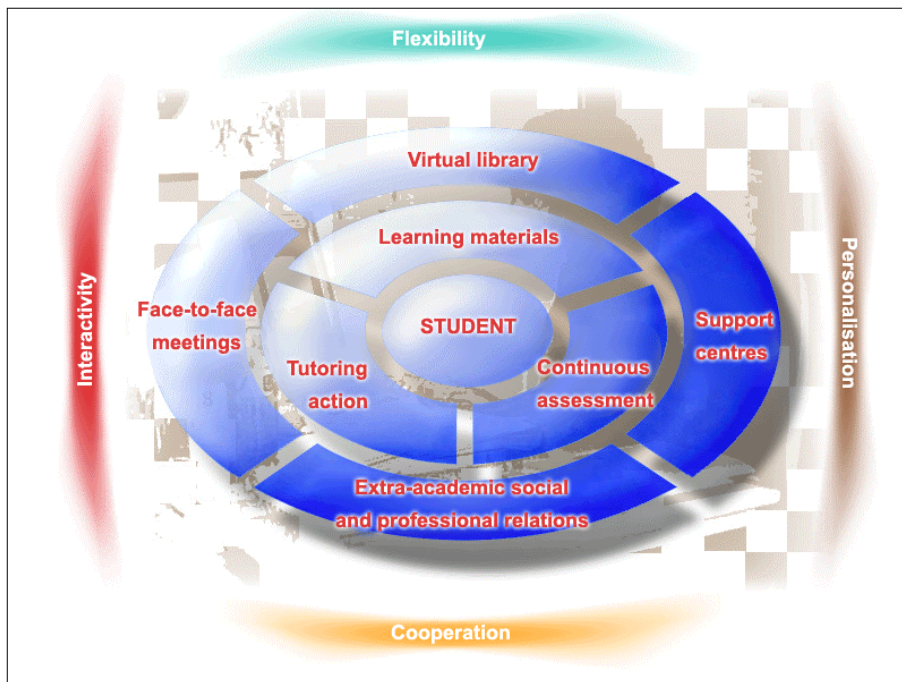
Generally, teaching institutions claim to use a student-centred model. This is because there is a worldwide trend towards the decentralization of the role of the teacher in formal education in favour of a student-centred model. In this context the student becomes the user. From a radical viewpoint, the most student-centred models are mostly those based on self-learning or self-training.

The UOC is seeking to develop a balanced model, one that would combine the best features of each of the three models described above. The most balanced model, however, would probably not be placed at the epicentre of a graph showing the three models. It would be located a bit closer to the student than the teacher, and a bit closer to the latter than technologies, which should remain a tool serving the other two elements if the university is to reach its objectives and fulfil its educational role (see Figure 3).

Student-centred models must endow the students with enough freedom to take advantage of the support offered, to plan their learning process and to regulate their own working rate. Every element in the pedagogical model should serve students so that they can develop their own learning skills. In order to reach this objective, two basic points in web training should be taken into account: high pedagogical quality and the emphasis on personalized support.

For students to become motivated and be involved in their own teaching and learning process, active methods need to be fostered. However, inductive methods used by teachers, together

Figure 3 The UOC's pedagogical model



with learning materials, provide guidance and orientation, enabling students to follow the right path, thus facilitating the teacher's role of making things easier.

From the very beginning of the UOC initiative, the need for creating a virtual community in order to offer a real learning space was understood and supported. All members of the university community can interact through the UOC's virtual campus: from their homes, students can receive personal attention, interact with their classmates, counsellors and tutors, gain access to university services, take part in virtual work or debate forums, and have the opportunity to come in contact with the world's extensive university scientific and cultural community.

Learning materials

The main role of the learning materials is to gather and transfer the basic contents of a course. The learning materials also present the basic objectives of the course, self-evaluation activities, summaries, etc., and they are designed to make the learning process simple and stimulating.

Teaching materials are created by specialists (from the UOC or elsewhere) and by a work team involving instructional designers and technological specialists (Guàrdia, 2000). These materials can be paper-based or multimedia, and they combine different technologies in order to take full advantage, from an educational point of view, of all the resources available. At present, more than 840 course materials have been developed by the UOC.

For each course, students are provided with a set of multimedia study materials (print, web-based, discs, videos, computer programs, cassettes), which contain course objectives, contents, self-assessment instruments, activities and assessment criteria. As a result of the research and development that the UOC is carrying out in the field of new technologies, the university is currently developing and experimenting with new, innovative types of

educational materials (Sancho et al., 1999). Therefore, the number and quality of digital-based educational materials the UOC uses is bound to increase.

At the beginning, in 1995, the UOC had to develop its first teaching materials based on paper. Obviously, back then the Internet and especially the web could not assume the delivery of multimedia materials. For this reason, the UOC started out by sending paper-based materials to all students. After some years, however, the university progressively increased the number of CD-ROMs and web-based educational materials, moving closer to the educational model it was looking for.

All the different elements of the UOC pedagogical model are integrated and related within the virtual campus. At any time (night or day), students can send messages to their classmates and professors, which allow them to share experiences, ask for clarification or make suggestions and participate in the university's different social, cultural and academic activities, as well as access the university's administration services.

Teaching

The teaching and learning process takes place within the virtual campus thanks to the collaborative effort of the following:

- *Professors*: full-time teachers. They design the teaching plan for each subject and are responsible for contents.
- *Teaching co-ordinators*: train people who are actually involved in the development and delivery of courses (i.e. full-time teachers, counsellors, advisers and tutors) and co-ordinate their activities.
- *Instructional designers*: design the learning materials from a pedagogical and methodological point of view, and give guidance to their authors.

Most important of all are the tutors and counsellors who work with students. The tutoring provided to students involves two types of professors: tutors and counsellors, who work for the UOC on a part-time basis. Over 900 tutors and counsellors are currently involved with UOC teaching tasks. Students are assigned a tutor for each course.

The tutor is a specialist in a particular subject and his or her main functions are:

- to guide (through the teaching plan presented at the beginning of the semester);
- to stimulate (through forums and debates on the virtual campus);
- to evaluate (through continuous evaluation and the final examination) the progress of the student's learning process.

Students are also assigned a counsellor, who provides general advice throughout their studies and who becomes their personal adviser and their main interlocutor during their stay at the university. In addition, the counsellor:

- supports the student during the registration period;
- introduces the semester's activities;
- monitors student performance during the semester and provides a global evaluation; for continuous evaluation, students undertake a series of activities during the semester to ensure that they are achieving course objectives and actively participating in building their own knowledge.

Although the UOC is a virtual university, it provides an opportunity for students and professors to meet and interact with each other, face to face, twice every semester at meetings organized at the same time for all the courses and held in a public university campus close to Barcelona. The first meeting, at the beginning of the semester, serves as an introduction to the course, and the second meeting, at the end of the semester, acts as a round-up session.

In addition, the UOC is setting up a network of local support centres, which will extend over the entire Catalan region, and reach as far as Madrid and Brussels. These centres have a media library with all of the UOC's multimedia and reference materials, as well as computers connected to the virtual campus for student use. The support centres also have meeting rooms and study rooms that students can reserve.

The virtual library supports student training and allows students to gain access from their homes to specific resources (digital library, databases, etc.) and information services (documentation, virtual desk, etc.) developed by the UOC Library. Students can also access the libraries and information services of the other Catalan universities, or navigate through the information networks and services of the Internet.

The virtual classroom

Classes are taught virtually and take place in this Virtual Campus (VC) teaching area. This area has the following functionalities.

- *Messaging the tutor*: when a UOC student wants to send a message to the tutor, the VC automatically configures this option so that the appropriate tutor's name is selected for each student and is automatically used for messages.
- *Subject mailbox*: this is a common area with access for students and tutors, and corresponds to a traditional classroom. The VC ensures that, after logging on, the students access the correct 'classroom', i.e. the students and tutor virtually 'meet' and can communicate if they belong to the same group. By clicking on this area the participants will find a bulletin board, a forum and a debate space.
- *List of students*: the student's classroom list is where all fellow students and their tutor are listed (photo, names and CV).
- *Related materials*: the materials area is where everybody can find materials related to a subject, activity or course.

One of the UOC's main goals is to create a learning system where students can acquire not only knowledge and promote their skills, but also learn to learn. In this learning process, achieving the different objectives depends primarily on the quality of the materials, which are carefully designed to be dynamic, intuitive and self-explanatory for students in a distance-education environment.

Continuous assessment

The university offers evaluation by continuous assessment, providing activities to be completed during the semester. This is the best guarantee that the students will achieve their learning objectives. However, this evaluation is optional, and students can follow it or not. Course results are a weighted balance between the assessment of the entire course and the results of the final examination, which is compulsory for all students. Those who do not follow continuous assessment activities can directly take the final examination. Currently the UOC is testing new assessment models in order to increase the flexibility of its evaluation methods.

Student support

The UOC was founded with the vocation to break the isolation of students in traditional distance-learning models, and to take into consideration the particular nature of its student community, which consists primarily of working adults. Hence, the UOC is committed to offering services that truly match the needs of its student community. A wide range of student services is available through the virtual campus of the university.

- *Administration services:* Students can access the university secretariat from home at any time, day or night, consult UOC regulations and study plans, register for new courses and examinations, consult results, modify contact data, request certificates, and make inquiries.
- *Associations:* Students have the option to create their own student associations and use a restricted discussion area in the VC where they can exchange information and organize activities.
- *Community forums:* These are discussion forums, open to everybody at the UOC, in which students, professors, and others can discuss topics of interest in a free and open way. Some forums are organized around specific topics of common interest, such as culture, sports, games, etc.
- *Notice board:* Within the VC, students can send and read messages using the general notice board which posts messages for buying and selling computers, cars, housing, etc., and for advertising events and activities.
- *Purchase cooperative:* ‘La Virtual’ is a cooperative that belongs to the students, professors and staff of the UOC and allows them to negotiate product cost and buy products at reasonable prices. Currently, La Virtual offers hardware and software applications and programs, books, bank services, household goods, etc.
- *Publishing service:* EDIUOC is the UOC publishing house and is dedicated to publishing books that may be of interest to the students of the university.
- *Employment bureau:* A specific space in the VC that lists job offers.
- *Library:* The virtual library at the UOC allows students to access documentation services, the library catalogue, loan services, the information desk, inter-library loans, user training, etc., from home via the VC.
- *Cultural activities:* Information on cultural events, as well as discounts on tickets, are made available to the UOC community through the VC.

Some services, such as the ‘hot line’ service that gives advice to students who are having difficulties with the virtual campus, are completely outsourced to leading-edge companies.

Besides providing support to students in their studies, the UOC network of support centres organize cultural entertainment and leisure activities all over Catalonia and Spain, as well as in Brussels. Moreover, students can make suggestions and consult the services offered through the different mailboxes and forums that are part of the VC. In order to gather student opinions and improve the quality of UOC studies and services, a survey is conducted at the end of each semester.

The UOC access and enrolment systems were designed to work both virtually and face to face. The systems are flexible enough to solve any time or space constraints or other inconveniences. They were also designed to provide – in an understandable manner - all the information that is necessary to make certain decisions. For example, special consideration is given to students with special needs, such as disabled people (blind, deaf etc.) or professionals

with time constraints. In the case of disabled people, a UOC research group is developing special features for the VC in order to make it navigable for blind or deaf people.

Government scholarships are given to students with financial needs. The UOC negotiates this aid, which can take the form of a refund for university fees or financial help for purchasing books and materials, with the Catalan government, The UOC also offers certain grants to help students meet their credit commitments.

The virtual library

Throughout time, libraries have always played an important role in the collection and diffusion of knowledge, and today they meet many of the cultural, leisure, academic and general-knowledge needs of the new information society.

Modern libraries benefit from innovative applications that allow them to develop all of the classical library services as well as new ones, and they can do this in a more efficient and cost-effective way through the use of advanced information and communication technologies.

In this context, the mission of the UOC Library is to give support to the study, teaching and research that takes place within the university. This mission is not very different from that of other university libraries, although the UOC Library has one important distinguishing characteristic: the 'virtual' nature of its contents and services.

The UOC Library, which is accessible through the virtual campus 24 hours a day, 365 days a year, is a new model of library service. It is flexible and designed so that users can take advantage of the new information technologies regarding data registered and stored any place in the world. It is a 'library without walls': there are no walls impeding access, no walls holding back information, and no walls to stand in the way of the flexibility and personalization of its services.

Users of the UOC Library have the following services at their disposal:

- *Documentation service:* This grants users access to a wide selection of databases in relation to both UOC studies and interdisciplinary studies, and at the same time guides, educates and assesses users in their search.
- *Selection of resources:* An up-to-date selection of electronic resources, both interdisciplinary and those related to what is currently being taught at the UOC.
- *Catalogue:* The catalogue contains library references to all the documents available at the UOC Library.
- *Access to other catalogues:* This allows users to access the databases of libraries available on the Internet and consult their resources.
- *Library loan service:* Documents from the catalogue can be taken out on loan and the library will send them to the user's home by means of a delivery service.
- *Virtual desk:* The primary function of this service is to provide a quick response to specific questions. As part of this service, a library team responds to all the requests of a bibliographical nature. There is also a series of tools to help users in solving their information needs: encyclopaedias, dictionaries, databases, etc.
- *Document request and inter-library loan service:* The purpose of this service is to locate library resources that are not available at the virtual library and request these from other libraries not directly associated with the UOC, or receive reproductions of parts of such documents and provide them to users electronically.

- *Support libraries:* Each UOC support centre has a library so that students and faculty of the UOC have a place for study and consultation within their reach, as well as the recommended bibliography for each study programme.
- *User training:* Users of the UOC Library receive three types of training on how to use the library: virtual training, training at the support centre libraries with specialized personnel, and training during the meetings that are held twice a semester.

The UOC Library has an active policy of developing its own research and also participates in international research projects, in particular European Commission projects, following its vocation of acting in synergy with other libraries and universities, sharing its investigative experience and developing new ways of providing library services and accessing information.

Given the particular characteristics of the UOC and its educational model, the university's virtual library is especially interested in studying open and distance-learning services and providing all the information needed to support the learning process. For this reason the library is committed to developing new ways – using information technology, in particular telematics – of providing library services to users studying at a distance.

Lessons learned

In an effort to provide an education that is complementary to what the other universities in Catalonia have to offer, the UOC has developed courses and degree programmes that are increasingly in demand but that conventional universities are not proposing in sufficient quantity to meet this growing demand. The UOC's offer focuses on an adult student population: people between 25 and 45 years old, who work and who have previous university experience.

Although this may lead us to believe that the UOC offers primarily postgraduate courses, the reality is quite different. Most UOC courses are at the undergraduate level, taken in particular by people who did not have the opportunity (for different reasons) to finish their studies when they were younger. The UOC is giving these people an opportunity to participate in the process of lifelong learning.

For students who want to obtain an official degree at the UOC, admission requirements are the same as those for all the public universities in Spain. The UOC also offers courses that are open to everyone.

The UOC is involved in the Catalan Agency for the Quality of the University System, and is working with the agency to develop indicators for measuring quality in virtual learning environments. The university has already developed different means to maintain an appropriate level of quality, such as surveys, open debates and qualitative interviews. From the very beginning, ensuring quality has been a key issue for the UOC, and this concern over maintaining quality has been a core factor in its success.

The UOC teaching and learning model, in other words, the university's educational model, aims to overcome time and space barriers for education and training. From this perspective, the UOC is opting for an asynchronous model, which allows greater flexibility for students.

This model is student-centred, emphasizing the following three elements: specially designed learning materials and resources, teaching action based on two different teaching roles (tutors and counsellors), and a continuous assessment system to give support to students in their learning process.

Over these past few years we have learned that the most important issue in giving students a real opportunity to learn in a virtual, distance education environment is flexibility. But the problem is not so much the environment, or its virtuality; the real question is the students' availability and their dedication to study. So, our concern here is to foster an appropriate context to make studying easier and more rewarding.

Personalization, cooperation and interactivity are other important aspects for improving the university's educational model. The UOC experience has shown that technology is important for developing a virtual university, and plays an important role in the proper functioning of the organization. However, the most important aspects for achieving good results are the organizational and the educational models that the university has adopted.

A virtual university is not merely a platform for delivering courses, but a complete organization focused on student support and services. The whole university must be designed so that it can meet all the needs of students working from home.

5. Cooperation

In order to play an active role in society, and take advantage of the resources and infrastructures that are available in the Catalan region (teaching staff, library resources, buildings, etc.), the UOC has signed collaboration and cooperation agreements with public and private institutions.

Many higher-education institutions have decided to develop distance education experiments by applying UOC's successful pedagogical and technological models. The UOC has been assessing these institutions and helping them by transferring its models; for example, this has been the case for many Latin American universities.

The UOC's successful experience in online education has also motivated some conventional universities to seek guidance in how to use ICT (Information and Communication Technology) in university teaching, as a complementary or dual mode. The UOC is glad to offer its expertise to these institutions in the hope that this will increase collaboration among them and stimulate their development.

The UOC promotes credit transfer from other universities with which it has signed collaboration agreements. The reason for doing this is to offer students a wider range of courses, even in areas where the university does not specialize. Currently, several programmes are covered by these agreements. For example, a large number of courses are offered under the 'Metacampus' programme, which makes it possible for students to take virtual courses at other universities without leaving their own virtual environment.

In the international Year of the Culture of Peace (inspired by UNESCO), the Decade for the Peaceful Resolution of Conflicts (promoted by the United Nations) and in accordance with the Act relating to peaceful solutions to conflicts and the culture of peace (approved by the Parliament of Catalonia), the UOC provides the international university community with a space for dialogue, cooperation and work to promote peace in the global sense of the word. The Campus for Peace⁸ gathers and promotes expressions and human actions that foster peace, all those humanitarian values and humanistic reasons that different cultures and human sensibilities have contributed and continue to contribute in their efforts to create a better world.

The Campus for Peace is the virtual city for peace, solidarity, humanitarian aid and sustainability, created by the UOC. It is accessible from any part of the world, at any time. This initiative is aimed at generating synergies to improve the living conditions and dignity of people and nations facing critical situations as a result of war, natural disasters and poverty. This is the first initiative of its kind, providing a global space open to all. It promotes integration and pluralism and has been conceived on the basis of a global perspective of human progress.

The Campus for Peace serves people and organizations that are directly involved in the processes of peace, solidarity, human rights, humanitarian aid and sustainable development. The aim of this open space is to be an instrument for dialogue and cooperation, in addition to optimizing the work, various initiatives and specific aims of organizations, institutions and the

⁸ <http://www.campusforpeace.org>

world virtual university and scientific campus that hope to help nations facing critical situations and help build a world and culture of peace.

Lessons learned

Despite its brief existence, the UOC has a clear and evident commitment to cooperation. The UOC believes that by helping other universities to develop high-quality virtual learning systems it will increase its own credibility. Hence, the UOC is launching a number of initiatives to offer universities interested in collaboration the opportunity to progress together, by benefiting from UOC's good practices and avoiding its mistakes. The UOC is proud to share its experience with other universities if this can improve university teaching through the use of ICT.

The UOC further considers that it is very important to provide a framework for exchange between universities that offer virtual courses, so that they can offer more opportunities to their students. The UOC is promoting the 'Metacampus'⁹ experience as an example of cooperation in virtual learning environments.

Cooperation is also an important issue in research. The UOC research institute – the Internet Interdisciplinary Institute (IN3) – is looking for partnerships with other similar research organizations in order to increase the efforts and importance of Information Society research.

Finally, Campus for Peace is an initiative to provide an international and virtual university space for dialogue, cooperation and work to promote peace in the world.

⁹ The mission of the Metacampus project is to demonstrate the global, virtual cooperation of universities; a concept known as the flexible university or the 'hyperuniversity' and which is achieved by interconnecting the partners' virtual services and infrastructures. The hyperuniversity will be able to capture, register, invoice, teach, assess and accredit courses and provide all the administrative services on a global scale, using the Internet as the only medium to support all these educational processes. Metacampus will go a step further than the mere use or development of virtual campus infrastructures (VCs or educational intranets) for the provision of online educational services.

6. Future development and institutional change

E-learning will experience incredible growth in Spain. First of all, the need for lifelong learning in an increasingly competitive society requires new and more flexible opportunities to learn and update knowledge. This is the reason why many companies, especially those involved in technology, intend to enter the world of adult education and training.

On the other hand, a decreasing birth rate in Spain may threaten traditional universities in the near future. Some people think that this can be an opportunity to reduce students-professor ratios, but this will also suppose a reduction in public funding. Because of this, most public universities are seeking to develop new programmes with the private sector, in an attempt to widen their potential customer base. In such a context, distance education seems like a good solution. The use of ICT is currently considered as a sign of modernity, a way to make people feel that they are headed in the right direction. But conventional universities are not likely to abandon their face-to-face educational models. They will introduce ICT in the classrooms and will offer a part of the curricula online. In time, traditional and distance education will converge, as Tait and Mills (1999) have mentioned.

Moreover, accessibility to communications is becoming much easier. The cost of communications is decreasing rapidly, and the number of people in Spain and Catalonia who have Internet access at home is rising daily. While there are bandwidth problems at the moment, we expect these to be solved in four to five years. Mobile communications are spreading very quickly, and developing a paradigm for mobile learning.¹⁰ Today we can only imagine the many possibilities this will give us, especially for accessibility.

The UOC expects to be one of the most important actors in this scenario, mainly because it can contribute its experience and will be a useful partner for any relevant initiative on e-learning. Besides, the UOC is keen to be a leader in the research field through IN3, its research institute, which analyzes the impact of the Internet in different sectors of society (economy, politics, commerce, social issues, arts, education, etc.).

Furthermore, the possibilities that Artificial Intelligence offers for developing a new generation of digital teaching and learning materials are being studied.

The UOC will play an important role not only because of its impact on education and business, but also because it is actively promoting cooperation and partnerships with other institutions in the field and guaranteeing the quality of online education and e-knowledge.

However, its biggest challenge will probably be how to best keep reshaping the organization so that it can meet the needs that continuing changes will create. This is the most important factor for developing a feasible and successful educational model.

¹⁰ It remains to be seen if mobile learning will develop a new paradigm that is different from the e-learning paradigm. To obtain more information on this, a research project will be started to analyze m-learning in greater detail.

7. Policy development, planning and management in the virtual university: the most important lessons learned and recommendations

This last chapter is dedicated to highlighting the factors we consider extremely important for institutions that are planning to adopt a more virtual educational model.

Far from giving lessons, we would just like to share a number of thoughts that were very important in our experience. As each situation is different, conditions are likely also to be quite different, and the policy and character of each institution will require different solutions. But if our thoughts can provide some interesting information and help others to avoid making mistakes and to progress further, faster and cheaper, we will be very glad.

A virtual university: adaptation, reconstruction¹¹ or invention?

In a previous paper, the author said the following:

It is still difficult to give a good definition of what is a Virtual University. That is because, for many reasons, there are numerous higher-education institutions trying a variety of teaching methods while using different degrees of virtualization in the organization.

Often concepts like Virtual University, Virtual Campus and Online Courses are confused; they are put in the same box when in reality they are quite different things. The term 'virtual university' should encompass the concept of a university as a whole that is offered to students and the teaching and researching community, the university itself. This is a rather different term to 'Virtual Campus'. Van Dusen (1997) gives a correct definition of the term when he says 'The virtual campus is a metaphor for the teaching, learning and research environment created by the convergence of new powerful instruction and communication technologies.'

Finally, Online Courses are a third stage, preceded by the already-mentioned other two. The third stage directly provides courses, without aiming to establish a possessive relationship with the institution offering them.

Lately, a new term has begun to be used in an attempt to cover a wider idea and, as usual, there are individual interpretations that establish definitions that are, at least, doubtful. All this is based on the English term 'e-learning'. This can be defined as 'the use of technologies based in the Internet that provide a wide variety of solutions that bring together the acquisition of knowledge and abilities or capabilities.' (Rosenberg, 2000). (Sangrà, 2002)

The fact is that most universities today are trying to make effective use of ICT in their teaching and learning systems. However, the way to do this can be very different depending

¹¹ In the framework of the international conference on *The use of technology in distributed learning* (Online Educa), held in Berlin in November, 2001, there was a session where different experts from different institutions exposed several policies and strategies to use virtuality in higher education. For more information, see <http://www.online-educa.com>.

on the tradition of the university, its background and who in the university is initiating this change.

This means that each university will require a different model to make the change. Some of them will need to adapt their structures. Some of them will need to undo some of their structures and re-build new ones. And some of them will even need to start a completely new project that is entirely different, with different players and conditions. The paper mentioned above (Sangrà, 2002) describes some of these models.

Our experience shows that the most important decision that needs to be taken is this: What is the best model for incorporating ICT into our teaching and learning? Do we really want to build a 'virtual university'? What is our present situation and what do we need to move to this new model? Finding the right answers to these questions will definitely help us reach our objectives.

Identity and globalization: from local to global

As mentioned in Section Two, there is the idea that if we want to develop a global university, it does not need to have a particular identity. However, we think that this component is particularly important. Virtuality does not mean that one cannot be rooted in a special context. Virtuality is not the absence of personality.

Our experience is a good example of this. We started by focusing on a particular profile of users and on a particular region; we have since then been able to extend our project to the rest of the world. And this has given the project much credibility. We can explain our rationale; we can explain how the project has evolved. We feel it is ours and it can become yours, because you will be able to give it its own identity.

You cannot manage a car like a horse

If you get into a car and kick the floor with your feet, it will not run. This could be useful if you are riding a horse, but not to drive a car.

A virtual university cannot be managed like a conventional one. A different management system is needed. When a university tries to survive in an increasingly digital world, it needs to be able to take quick decisions. Its management system must be flexible, adaptive and ready to act at any moment.

Some conventional universities try to manage their online programmes or their virtual extensions in the same way that they used to manage the 'regular' ones. We are convinced that virtual universities need a different kind of organization. Although there is probably no unique model for virtual organizations, they must avoid bureaucratic systems of organization, and move to new and more appropriate systems.

The concept of lifelong learning put into practice

The average age of university students is increasing considerably. The concept of lifelong learning is becoming a reality: people have new learning needs, that are more job-related and, due to time constraints, they seek to meet these requirements relatively quickly.

Given that virtual universities are a product of the new Information and Knowledge Society, they should orient their programmes in a direction that will enable them to respond to the

current demands of society. In order to cover the needs of different students, for instance, a virtual university should be able to offer both undergraduate and graduate courses.

The importance of being 'virtual'

Some of the experimental projects that are called 'virtual' are only partially so. From the very beginning, our experiment project tried to develop a 'philosophy of virtuality' for its educational and managerial models. In order to increase the credibility of this kind of educational offer, everything should be done virtually: enrolment, course delivery, examinations and research. That means, from home, with the use of a personal computer.

To be able to do that, a complete 'virtual organization' should be created. This is the real idea of a virtual university.

Achieving credibility through quality

Some conventional higher-education institutions are putting virtual universities under permanent suspicion. Moreover, the emergence of companies using technology to commercialize education is threatening the existence of virtual and online education.

Virtual universities can best deal with this by working to ensure a high level of quality, and denouncing those virtual-education projects that are of poor quality. A strong commitment to quality development is fundamental to the success of any virtual university.

Developing consortia of different virtual universities might be one good way to establish quality criteria, indicators and highlight good practices for benchmarking.

The wheel does not have to be reinvented

At the beginning of our university, we needed to build our own technological platform, but that is not the best approach in all cases.

At present, with many technological platforms on the market, one might consider whether to build a new platform or take advantage of the opportunities that the commercial sector is offering universities. There is no single 'right' answer, and 'the' solution does not exist. But it is important to conceive a strategy and take into consideration all the different possibilities. The syndrome 'not invented here' could be a terrible obstacle for the future development of the institution.

Problems with intellectual property and copyright must be avoided

Faculty tend to be extremely worried about how intellectual property and copyright will be managed. If a virtual university does not have a policy in this field, it will be in trouble. Each country, each context, may need a different policy, a different strategy, but they need to have one.

Asynchronicity as the basis of a new educational model

Virtual systems of education should avoid imitating conventional ways of teaching and learning. We try to develop new strategies for what we consider to be a new way of teaching and learning. Seeking to imitate face-to-face activities in a virtual environment would only result in a bad copy of the original.

However, a totally asynchronous model – as compared to a mixed model – would provide greater flexibility for students, especially for adult students who make up the largest part of

our student body. Furthermore, the faculty must make a special effort to develop new strategies that will enable them to achieve the same aims they would like to achieve in a conventional classroom.

Putting the student first!

This should be more than just a catchy phrase; it should be something real. Virtual universities make it possible to develop a truly student-centred model, focusing more on the student's learning needs.

The educational models of conventional universities are still teacher-centred. Yet the use of ICT is bringing about an authentic change in how classrooms function or students perform, and virtual universities are a good example of how this change can be used to the greatest advantage.

Build a real university, not just an electronic platform...

Some universities believe that you can develop virtual courses just by using an electronic platform: that is a big mistake. A virtual university is not merely a platform for delivering courses. What we need to do is develop a complete organization using ICT, focused on student support and services.

Our experience shows the importance of technology in building such a university, but the key issues to guarantee that the university will work are the educational model and, especially, the organizational model.

Cooperation for succeeding together

In the era of the Information Society, competitiveness seems to be the most important element for universities to be able to evolve or maintain their status quo in the near future. However, we truly believe that collaboration - much more than competition - will be the key factor for success.

Consequently, cooperation with other universities that are interested in developing virtual education is one of the basic strategies of our university.

Researching for progress

Finally, no reputed university can ignore the fact that it needs to develop research in order to contribute to new knowledge. The UOC strives to be a virtual university with a strong research component.

For this reason, we have sponsored and established a research institute, IN3. This institute will be specialized in researching the impacts of ICT, especially the Internet, on current society. Research in this field should contribute to finding ways of using technologies so that all of society benefits.

References

- Cabrera, N., Sangrà, A. 2000. Teaching and learning in virtual campuses: the Metacampus project. Proceedings of 6th ALN Conference, College Park, Maryland.
- Ferraté, G. 1997. Internet como entorno para la enseñanza a distancia. J. Tiffin and L. Ragasingham (eds), *En busca de la clase virtual: La educación en la sociedad de la información*. Barcelona: Paidós.
- Guàrdia, L. 2000. El diseño formativo: un nuevo enfoque de diseño pedagógico de los materiales didácticos en soporte digital. J. M. Duart and A. Sangrà (eds), *Aprender en la virtualidad*. Barcelona: Gedisa.
- Rosenberg, M. 2000. *E-learning: Strategies for Delivering Knowledge in the Digital Age*. McGraw-Hill, New York.
- Sancho, T., Masià, R., Santamaria, E., Mas, X. 1999. Discrete mathematics: a web-based approach. Proceedings of 19th ICDE World Conference, Vienna.
- Sangrà, A. 2002. Quality in examples in virtual higher education. Retrieved from <http://www.uoc.es/web/eng/art/uoc/sangra0102/sangra0102.html>.
- Sangrà, A., Duart, J.M. 2000. Formación universitaria por medio de la web: un modelo integrador para el aprendizaje superior. J. M Duart and A. Sangrà (eds), *Aprender en la virtualidad*. Barcelona: Gedisa. Retrieved from: http://www.uoc.es/web/esp/articles/duart/duart_pdf_esp.html
- Sangrà, A., Duart, J. M., Guàrdia, L. 1999. Putting the student first: when an innovative model leads to a new way of learning. Proceedings of 19th ICDE World Conference, Vienna.
- Tait, A., Mills, R. 1999. *The convergence between conventional and distance education*. London: Routledge.
- Van Dusen, G. 1997. The Virtual Campus: Technology and Reform in Higher Education. *Ashe-Eric Higher Education Report*, Vol. 25, No. 5.