THE VIRTUAL
UNIVERSITY

Models & Messages | Lessons from Case Studies

Edited by Susan D'Antoni

Universidad Virtual de Quilmes, Argentina

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An evolution of an existing institution

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List of abbreviations

CONEAU   Comisión Nacional de Evaluación y Acreditación Universitaria (National Committee of University Assessment and Accreditation)

ICT   Information and Communication Technology

ISP   Internet Service Provider

UNQ   Universidad Nacional de Quilmes (Quilmes National University)

UOC   Universitat Oberta de Catalunya (Open University of Catalonia)

UVQ   Universidad Virtual de Quilmes (Quilmes Virtual University)

1. The Universidad Nacional de Quilmes and its context

1.1 International context

The Universidad Nacional de Quilmes (UNQ) is a state higher education institution that was founded in 1989 and started its teaching/academic activities in 1991. It is part of a group of public universities that were created by the Argentine National Congress between 1988 and 1995 in the Buenos Aires suburbs, that is to say, cities adjoining Argentina's capital or very close to it. Despite the differences that might exist among these universities, they tend to appear as offering alternative or innovative education models compared to those of traditional universities.

The UNQ's youth is an advantage over more traditional universities as it allows for greater flexibility and the ability to adjust to the changes occurring in university systems throughout the world.

As this paper outlines, the UNQ aspires not only to become a high-quality university, but also a university capable of successfully competing with foreign universities that might establish subsidiaries in Argentina, and might address the Spanish-speaking higher education market of the Americas through the Internet.[1]

Unlike other university initiatives in distance education – for example, Open University in the UK, UNED in Spain, UNEDs from Costa Rica and Venezuela, and Universitat Oberta de Catalunya (UOC) from Catalunya – the Universidad Virtual de Quilmes (UVQ) is a virtual education programme implemented by an existing university, the UNQ. In other words, as we show in this paper, the Quilmes case is similar to that of the Tecnológico de Monterrey (Mexico); in both cases, universities that originally offered face-to-face education have lately become involved in distance education. The UVQ is contemporary with other university distance education programmes that were started in Argentina in 1998.

Distance education was born in Argentina in the 1950s within the non-formal education environment. These programmes did not have high professional standards; thus, their credentials were not competitive when compared to formal education programmes. In other countries of the region, distance education was implemented to achieve literacy in large population sectors that could not receive an institutionalized education. In Argentina, where the initial education policy programme implemented by the national state in the late nineteenth century was based on the principle of free, mandatory and secular education, large sectors of the population had access to elementary and secondary schooling early on. The education programme became the first social policy of the modern Argentinean state, with national scope and specific rules and resources. In the 1980s distance education programmes were added to supplement university degree programmes. A decade later, distance education programmes lost their exceptional character and were becoming an increasingly important issue on the university agenda. In 1993, Red Universitaria de Educación a Distancia (Distance

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[1] The Universidad de Bologna was the first foreign university to be established in Argentina, in the mid-1990s. In turn, US universities formed joint ventures with Argentine private universities for the joint granting of postgraduate degrees. Recent literature on this subject indicates that universities from developed countries and, in particular, from Europe, have started a transnationalization process due to sluggish enrolment and restrictions of public funding at home.

Education University Network) was created. It provides a means for exchange among state universities and aims to become one of the coordination and planning bodies of the Argentine university system, provided for under the Higher Education Act No. 24.521.

The number of students who are enrolled in online programmes – more than 4,000 – at the UVQ is modest, compared to the Tecnológico de Monterrey, which has some 80,000 students, although this total figure includes students attending short-term professional training courses. However, the UVQ is not that small in terms of the number of students who take their full undergraduate studies through the online off-campus programme.[2]

Since UNQ's online off-campus students account for nearly 30 per cent of the overall number of undergraduate students there, UNQ can be considered a bimodal university.

1.2 National context

In 1998, the Argentine university system had 1,114,085 undergraduate students attending courses at the country's 36 state universities and 42 private universities. The number of university students in Argentina was below 400,000 until 1984, when the country regained democracy. This explosion in the number of students enrolled in higher university studies can be explained by the elimination of formal education systems that restricted admission to universities, the opening of the university sector to private universities, and the increase in the number of secondary school graduates.

The Argentine universities' enrolment rate is 20 per cent of the population between 18 and 24 years old. Some 40 per cent of high-school graduates enrol in university, one of the highest rates worldwide.

It is worth mentioning that the Argentine higher education system is strongly biased towards university education, since non-university post-secondary studies are essentially for teacher training and cater to approximately 400,000 students. Non-university post-secondary technological institutes are non-existent, and demand for higher education in this field is met largely by universities.

State universities are run by the central government. In 1972, public provincial universities were taken over by the national state, and over the past fifteen years, ten new national universities were created.[3]

Until 1992, the establishment of private universities was severely restricted. Only a few, mostly denominational, private universities were created in the late 1950s and early 1960s. Afterwards, the establishment of new private universities was banned until 1992, when the existing restrictions on new private universities were lifted. Most of the forty-two private universities now in operation were founded during the 1990s. At present, the operation of

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[2] There is no agreement yet on the name for off-campus education that uses new telematic technologies. The term 'distance' is not appropriate since there is 'no distance' in virtual environments. Moreover, if, as in the UVQ case, the asynchronous mode is chosen, there is 'no time' either. The expression 'virtual' is better but not completely satisfactory since virtual things exist in time but not in space. Probably the most contradictory expression is 'virtual reality', which illustrates the complexity of this issue. The Asociación para el Desarrollo de la Tecnología Educativa y Nuevas Tecnologías Aplicadas a la Educación (Association for the Development of Educational Technology and New Technologies Applied to Education) proposes the term 'tele-teaching'. This paper uses the expressions 'virtual environment' and 'off-campus environment' interchangeably.

[3] Two of the ten new national universities had been previously established by two provinces after 1972.

private universities, as well as of new state universities, is subject to approval by the National Ministry of Education, with the prior assessment and issuing of a favourable opinion by the Comisión Nacional de Evaluación y Acreditación Universitaria (CONEAU, National Committee of University Assessment and Accreditation).[4]

State universities account for 85 per cent of university students – with a total number of over 1.3 million students. The number of students who graduate from state universities averages 38,400 a year, versus 15,400 graduates from private universities. If we compare the data on students and graduates from state and private universities, it is evident that the latter have a substantially higher productivity coefficient (graduate/student ratio). The annual growth rate of the number of students who graduate from state universities is approximately 4 per cent; this rate amounts to 11 per cent for students who graduate from private universities. In Argentine state universities, 19 out of 100 enrolled students complete their studies (Del Bello, 1998).

A study carried out by the Organisation for Economic Cooperation and Development (OECD) in 1966 asserted that during the 1960s Argentina had some of the highest rates of enrolment in higher education in the world, greater than those of the European countries. For example, while the United Kingdom had few post-secondary students and many graduates relative to the population, the opposite was the case in Argentina, where easy access compromised quality, resulting in high drop-out rates and few graduates (Balán, 1998).

The restricted admission university systems operating in developed countries achieve equity through broad scholarship programmes. Although Argentina has an unrestricted system, scholarships paradoxically account for only 0.4 per cent of the total annual expense of state universities. The granting of scholarships as a way of financing regular students represented on average only 0.5 per cent of the financing.

University students coming from lower-income households represent a minute share of the total number of students in Argentina, even lower than in the case of other Latin American countries where universities charge tuition fees. The Argentine case demonstrates that an open and unrestricted admission system is not synonymous with social equity. The state's contribution to higher education accounts for 0.6 per cent of the Gross Domestic Product, for a consolidated amount of contributions to the education sector of 3.7 per cent. Therefore, in relative terms, the state's financing of higher education with respect to the wealth of the country is not substantially different from that of some European countries, such as Spain, France and Italy, but it is notoriously lower in Argentina for elementary education.

The data mentioned above reflect a state university system with significant deficiencies resulting from historical-political factors. The Argentine state university was developed from a model with the following features: a strong presence of students in the university government and a strong emphasis on liberal-profession studies (half of the enrolled students take law, medicine, and accounting degrees). Later, two characteristics were added: no tuition fees (since 1947, except during authoritarian government periods) and, more recently, unrestricted admission. These predominant features of the Argentine university model were partially changed (for the worse) during authoritarian government periods, when universities lost their autonomy (the state took control of the university government, there was no choice

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[4] The authorization process for private universities to operate has two stages: during the first, a temporary authorization is granted; during the second, after six years of operation, the national government assesses the university's performance and grants the final authorization.

of faculty chairs and teachers were dismissed for political and ideological reasons) and admission restrictions were established. The loss of autonomy implied a decline in the levels of quality and excellence, and admission restrictions were mainly formal and did not improve the rate of student retention.

The public university enjoyed its highest prestige between 1958 and 1966, the so-called 'golden age' of the Argentine university. This was the only period when university autonomy (in the framework of pseudo-democratic national governments due to the political proscription of the Peronist party) coexisted with high levels of excellence, non-formal but substantive admission systems based on merit, and free education.

After a long series of de facto governments between 1966 and 1984 – except for a short democratic period between mid-1973 and early 1976 – the situation in the past two decades has not improved; in fact, it has become worse. The higher rate of high-school graduates does not necessarily mean better quality; according to the results of achievement tests that students take to obtain school-leaving certificates, Argentine high schools have very low levels of academic performance. This, along with the lack of strict university admission requirements based on merit, results in great numbers of students entering the university and later a phenomenal number of them dropping out. Since 1984, autonomous university governments, except for a few cases, have made strides toward democratization by opening up admission. Compared to Argentina, the Brazilian university system – though much younger, with less than forty years of existence – is based on a more scientific model, with limited admission, which enables the private sector to play a more active role in absorbing demand.

An extremely high number of faculty members (63 per cent) devote only ten hours of work per week to the university. As a consequence of such low dedication, only a small part of the faculty carries out R&D activities: 18,700 out of a total of 102,000 university faculty members.

Since 1993 – and after almost five years of budgetary constraints – the national government has been implementing a strong reform process together with annual budgetary increases. In 1998, the Argentine State doubled its 1992 public university contributions. State financing went from US$940 million in 1997 to US$1.8 billion in 1999, and the latter financing level has been maintained up to the present. Between 1992 and 1996 state and private universities became fully autonomous and financially independent; the creation of private universities was authorized; it was decided that faculty members should have at least 50 per cent involvement in collegiate government bodies; R&D activity was encouraged, and showed a fourfold increase in that period; CONEAU was established and the Fondo para el Mejoramiento de la Calidad (Quality Improvement Fund) was created to support structural reforms affecting university studies and schools. However, the idea of a university for the masses remained unchanged, and still conspires against an improvement in state university performance.

Future challenges for Argentina are: (i) the reform of high-school education (only 54 per cent of teenagers finish secondary school); (ii) the development and diversification of non-university higher education; (iii) a greater opening of the higher education market; and (iv) a reform of the state universities' operational regulatory framework. With regard to the last item, the biggest challenges will be: changing university admission policies and procedures; putting an end to the free tuition structure, defining length of curriculum for obtaining a degree; increasing research and development in technological innovation leading to scientific production; and developing virtual programmes for highly demanded degree courses (i.e. business administration, law, social sciences).

Government policies on off-campus online education come under the Federal Education Act (No. 24.195) and the Higher Education Act (No. 24.521) passed in 1993 and 1995 respectively. The former sets forth that university distance education and other education models such as alternative, experimental and open universities are to be governed by a specific law.

Act No. 24.521 sets forth, through a later regulation, that the executive branch of the government is to provide for the creation and operation of different models of institution organizational design and pedagogical methodology. The different models referred to in the text include a non-conventional approach, as opposed to face-to-face university education. The Higher Education Act sets the framework for future regulations so as to guarantee that off-campus online educational offerings will have the same level of quality as the face-to-face education model.

In 1998, the executive branch regulated, under Decree No. 88/98, what is known as distance studies and, through Ministry Resolution No. 1716/98, established instrumental guidelines for providing and monitoring distance university activities; these included an outline of requirements for granting nationwide validation of degrees obtained through distance education programmes. The above-mentioned regulations have been strongly criticized by all public universities, which consider these to be excessively prescriptive and a violation of the university autonomy principle.

Virtual university programmes were first created in Argentina in the late 1990s. Previously, universities had begun to add institutional information to their telematic networks, and were also using these to offer a few services: registration, enrolment information, handling some administrative procedures through e-mail, and publication sales.

The following state universities have developed distance education programmes using new telematic technologies: Universidad Nacional del Sur, Universidad Nacional de La Plata, Universidad Nacional del Litoral, Universidad Nacional de Cuyo, Universidad Tecnológica Nacional, Universidad de Buenos Aires, Universidad Nacional de Lomas de Zamora, Universidad Nacional del Centro and Universidad Nacional de Quilmes.

As regards telematic infrastructure for the development of distance education programmes, in the early 1990s Argentina started a major modernization process of its telecommunications sector beginning with the privatization of the state-owned telephone company.

Argentina's progress regarding new information and communications technologies, however, has been relatively poor. Argentina lags far behind the world's most developed countries, as well as Korea and almost all European transition economies, and even somewhat behind other Latin American economies, such as Chile and Uruguay. However, Argentina is still ahead of countries such as Brazil, Mexico and Venezuela.

Argentina has an important fibre optic network structure for international and national communications. There are at least six networks across the whole country, with services ranging from videoconferencing to Internet pages and data, to telephone calls. This provides large urban centres with the same international connectivity enjoyed by other world capitals.

The Argentine Internet market experienced exceptional growth in the 1990s: between 6 and 7 per cent per month. By mid-2000, there were approximately 1,800,000 users (Prince and Cooke, 2000).

In general terms, the number of Internet users in Argentina will grow at the same pace as the offering of contents and applications, and undoubtedly instruction and training contents will be among the highest value-added applications.

Most Internet users (67 per cent) residing in Argentina are between 19 and 39 years old; 59 per cent belong to the highest-income socio-economic level (ABC1). Ten per cent of all users older than 19 years have postgraduate studies; 29 per cent have completed their university studies, and 21 per cent have incomplete university studies. As these developments indicate, the spread of new Information and Communication Technology (ICT) does not reach medium-low and low-income social sectors with limited education levels.

1.3 Institutional context

The UNQ was established under a law passed by the National Congress in October 1989 as part of the government initiative aimed at creating new state universities in Greater Buenos Aires.[5]

The UNQ was opened during the 1991 academic year, and its first autonomous government was established in December 1992. It has over 10,000 students, approximately 6,000 of which are on-campus students while more than 4,000 are part of the UVQ programme.

The UNQ consists of three academic departments: the Social Sciences Department, the Science and Technology Department, and the Studies and Research Centre Department. It also has an Institute for Social Studies of Science and Technology. The academic departments and the institute are responsible for planning and teaching undergraduate and postgraduate courses, for conducting research and for curriculum development. University extension services are rendered through a secretariat that depends directly on the university's President.

The following university courses depend on the Science and Technology Department: biotechnology, food engineering, naval architecture, and industrial automation and control engineering.

The following university courses depend on the Social Sciences Department: social communication, education, international trade, hotel management, electroacoustic music and occupational therapy.

The Studies and Research Centre Department is organized into research units in the fields of basic sciences and social sciences, and the Institute for Social Studies of Science and Technology carries out research and is in charge of the on-campus Master's degree in Science, Technology and Society. The teaching for the Master's degree is conducted on a networked basis with foreign universities. Since 1999, the UNQ has had Ph.D. programmes that depend on the Vice-President's Office for Postgraduate Degrees.

Even though the oldest curricula date from 1991, the UNQ applies a permanent revision and updating policy. In 1997, the curricular structure of undergraduate studies was modified to be more flexible. The university chair structure (one teacher, one course) was eliminated, and the

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[5] Since Argentina regained democracy in 1984, the National Congress has created 6 national universities in Greater Buenos Aires (a territory concentrating approximately 5 million inhabitants). A reason for this legislative decision is that approximately 60 per cent of the 226,000 students taking courses at the Universidad de Buenos Aires – located in Buenos Aires City (8 million inhabitants) – reside in Greater Buenos Aires.

credit unit was introduced to evaluate curricular progress; moreover, the subject correlative order system was eliminated and university studies were organized into two phases: an initial phase or Diplomature with a theoretical duration of two years, and an advanced phase, with a theoretical duration of two years for Bachelor's degrees[6] and of three years for engineering degrees. For both basic and advanced phases, the degree is awarded when the student has obtained 150 credits from taking mandatory, general or optional courses. The initial phase provides basic education and training, and these studies are certified with diplomas in science and technology and social sciences. Students design their own curricula with the assistance of a tutor. The curricula reform introduced the Tutorship Management Unit depending on the Vice-President's Office for Academic Affairs.

The UNQ is located on the premises of an old factory, outside the downtown area of the city of Quilmes. This site provides the university with 18,500 m² of facilities that have been recycled as classrooms and laboratories. The UNQ is also renovating a building it shares with the Universidad Nacional de La Plata in a nearby town (Florencio Varela), where the laboratories of the formerly state-owned oil company (YPF) used to be located. The university's laboratories and workshops for industrial automation and control engineering, food technology engineering and naval architecture operate on those premises.

Unlike the unrestricted admission policy that prevails in other Argentine state universities, admission to UNQ is regulated. In order to be admitted to the university, students have to take proficiency tests on language and logic/mathematics skills. Students who obtain a grade of sixty or higher in each skill are automatically admitted to the university; the rest have to attend a preparatory course in those areas for one semester, which they must pass in order to become regular students.

Likewise, the UNQ Superior Committee – on suggestions made by the respective academic departments – establishes a minimum and maximum student enrolment quota for all of the university courses every year; the university operates on a system that allows new students to choose among four selected vocational options, similar to systems used in other parts of the world where the public university controls its size.

The UNQ is recognized nationwide for its high quality, which is reflected in its faculty members and the teaching system, whose main features are: (i) high percentage of full-time teachers (41 per cent of all faculty members versus a national average of 10 per cent); (ii) high percentage of faculty members doing research (35 per cent versus a general average of 18 per cent); and (iii) a salary system based on experience, opportunity cost and performance.[7]

Within the framework of the Higher Education Act No. 24.521, the Universidad Nacional de Quilmes has established a teacher career system that may be accessed through an open

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[6] Translation note: The term 'Bachelor's degree' has been used as a translation of *licenciatura*, a four- to five-year course at university level according to the Argentine education system.

[7] The UNQ was the first state university to innovate in terms of salaries after the labour and salary system deregulation (1995) affecting state university teachers. The faculty system was changed with the technical assistance of the Centro de Investigaciones para el Desarrollo (Research Centre for Development). Faculty hierarchies are: full professor, associate professor, assistant professor and instructor. Ordinary and theoretical classes are only administered by teachers and instructors coordinate workshops. Remuneration includes: (i) a basic salary, which depends on hierarchy and academic background (the scale is divided into fifteen levels); (ii) the value of the teacher opportunity cost; and (iii) the academic merit, only applicable to full-time faculty members, consisting of a bonus of up to 30 per cent of the basic salary and that rewards productivity. Additionally, faculty members are entitled to fees for consulting, engineering and R&D jobs commissioned by the university to third parties.

selection process involving competitive examinations, interviews and peer review. Staff promotions depend on biannual evaluations combining performance analysis carried out by external examiners and assessments of teachers by students. There are also faculty members who are hired temporarily, based on specific demands that cannot be met by permanent staff.

All on-campus classrooms have a maximum capacity of thirty students and the technical teacher/student ratio (excluding drop-outs) is, on average, one teacher per every twelve students, and one full-time teacher for every twenty students.

In the year 2000, the UNQ's consolidated budget amounted to US$19.9 million, of which US$16.6 million were derived from National Treasury contributions under the budget law; US$1.6 million from off-campus student contributions managed through the Campus Virtual SA firm, owned by the university; US$1.4 million from third-party income (training courses offered by the University Extension Secretariat, sale of small- and medium-sized ships designed and constructed by the faculty and students of the naval architecture programme, and R&D projects) and US$300,000 from credit financing.

While state universities in Argentina use on average 80 per cent of their budget for staff expenses, the UNQ uses 65 per cent. Approximately 10 per cent of the annual total expense budget is invested.

2. Creation and organization of the Universidad Virtual de Quilmes (UVQ)

2.1 Creation

The UVQ was created as an off-campus education programme, which uses the comprehensive software programme Campus Virtual as the means and environment for conducting its undergraduate and postgraduate training courses online. UVQ's programme implementation was possible thanks to a transfer and cooperation agreement signed between the UNQ and the UOC in October 1996.

The UOC was created in 1995 as an autonomous university within Catalunya University, with the special feature of being a university exclusively devoted to off-campus education in asynchronous virtual environments. The UOC has approximately 18,000 students, offers nine degrees, three Master's programmes, two postgraduate courses and one special admission course for people older than 25 years. At the same time, the UOC develops corporate training programmes and university extension courses.

UNQ's relationship with the UOC was set down in an inter-university agreement and the transfer of information technology was carried out through a licence to use the UOC's Campus Virtual platform. This collaboration is being handled by the companies owned by each university, Campus Virtual SA and GEC SA.

The UNQ created its corporate entity, Campus Virtual SA, to provide a vehicle for its educational programme in a virtual environment. The difficulties inherent in the public-sector management system governing Argentine state universities and the political opposition to the implementation of tuition fees for undergraduate university studies are, in our opinion, most likely the main reasons why a satellite company belonging to the university was created for the UVQ Programme.

As Internet development in Argentina was very limited, the UNQ decided to make a strategic alliance with a small Argentine company established as an Internet Service Provider (ISP). The university strategy consisted in providing not only the educational service but also the Internet connection, so as to guarantee overall quality. Given the ISP's small size, the university decided to become a shareholder in order to minimize risks. As pointed out later in this paper, the university relinguished its shares in the ISP during the third year of operation.

The server where the Campus Virtual software is installed is owned by the university, but managed on the ISP's premises.

UVQ academic activities started in early 1999 with courses for the Bachelor's degree in Education. It was thus necessary to obtain authorization from the National Ministry of Education in order for this degree to be valid nationwide.

The Higher Education Act (No. 24.521) provides that universities have 'academic and institutional autonomy' to 'create undergraduate and postgraduate courses', 'design and develop curricula' and 'grant academic and qualifying degrees' (Title IV, Chapter 2, Section 29). However, Act No. 24.521 also states that in order to grant a degree with nationwide

validity, universities will request authorization from the National Ministry of Education, which takes the decision based on analysis of the curricula, professional concerns, priority of the degree, and duration of studies.

We consider that all the decisions UNQ made in order to operate the virtual programme were the right ones, both as regards the software licensing and the simultaneous offering of education and Internet connection services. In fact, no proper link has been established yet between the UVQ and the Ministry authorities, since the latter are still reluctant to authorize full university studies via the Internet. The existing legislation on off-campus university studies was designed using criteria that do not provide for the use of the new information and communication technologies in academic processes. Specifically, there is a legal vacuum as regards postgraduate programmes, since CONEAU – the body in charge of accreditation and assessment at postgraduate levels – has not yet established the guidelines and criteria for off-campus online programmes.

2.2   Organizational structure

The UVQ's organizational structure underwent a logical evolution as processes became more complex. In early 2000, one year after it was launched, the university hired a consulting company to carry out a diagnosis of the UVQ operation and propose a new organizational structure.

The consulting company looked at the academic operation, administration and management control processes, analysed the programme's organization, its situation and optimization possibilities and proposed a new structure and organization, as well as the profiles of the new required positions. The consulting company did not assess either content or academic performance.

Among organizational deficiencies, it was found that responsibilities were not clearly defined and that processes lacked a methodological description. As a result of this work, a new structure was adopted, flexible enough to allow for future evolution. Thus, UVQ went from a 'foundation stage' to a 'mature stage' organization. The new organization, which was implemented in mid-2000, introduced planning and definition of responsibilities and processes.

Three kinds of processes are featured: (i) strategic processes, including decision-making processes at macro level; (ii) key processes, that is to say, academic processes in a virtual environment; and (iii) academic activities support processes: management, financial and economic administration, information and communications technology, institutional relations and marketing.

As regards strategic processes, the UVQ programme depends on the President's Office. The President chairs a Directive Committee formed by the people responsible for UNQ academic, economic and financial programming activities and by the UVQ Executive Director.

The UVQ Executive Director is, in turn, the General Manager of the company Campus Virtual SA, whose Board of Directors is formed by the members of the UNQ Directive Committee and the other UNQ vice-presidents.

Key and support processes stem from the Executive Director's Office. The former encompass the set of academic activities: undergraduate studies, postgraduate studies and other

continuing education and training programmes; the development of educational materials; the tutorship system; the assessment system and communications of the university community in the Campus Virtual.

Support processes are auxiliary to key processes and embrace: academic management (student enrolment and admission, addition of records to the Campus Virtual, Internet connectivity management for all university community members, and allocation of students to virtual classrooms); contacts with people interested in taking courses at the UVQ (call centre, marketing); management of computer support technologies (relationship with the ISP, communication links; development of applicative systems related to the Campus Virtual); and the administrative, economic and financial management.

Campus Virtual SA is in charge of enrolling students and charging them for the Internet connection services rendered, as well as for printing and posting educational materials. On the expenses side, the company pays royalties for using the IT platform; hires the connectivity service as well as the educational materials reproduction and posting services; conducts marketing activities; and develops, maintains and updates IT systems.

To sum up, the UNQ deals basically with academic processes and their management, while the company deals with support processes.

Undoubtedly, the organizational changes adopted in mid-2000 and the improved articulation between the company and the university have enabled substantial improvements in efficiency.

Since the end of 2000, the IT systems area has been consolidated and a new corporate entity, Sistemas Virtuales SA, has been incorporated, aimed at developing platform and application software, in addition to rendering consulting and technical assistance services to third parties, such as other universities that are starting training activities in virtual environments, business chambers, university professional organizations, etc.

2.3   Current programmes

The UNQ's Universidad Virtual programme has the following undergraduate studies:

- Bachelor's degree in Administration;
- Bachelor's degree in Public accountancy;
- Bachelor's degree in Social sciences and humanities;
- Bachelor's degree in International trade;
- Bachelor's degree in Education;
- Bachelor's degree in Hotel management and tourism;
- Bachelor's degree in Occupational therapy;
- University Technician's degree in Business administration sciences;
- University Technician's degree in Multimedia.

Moreover, since mid-2000, the UVQ has offered the Master's degree in 'Science, technology and society', which was already in place for UNQ on-campus students.

At the end of 2000, the UVQ started developing e-learning programmes. First, together with the Asociación de Bancos Argentinos (Argentine Bank Association), it developed the abavirtual.com platform through which training courses are offered to bank employees in areas such as customer service, accounting for non-accountants, auditing, verification of bills

of lading and checks. Second, a digital literacy course was developed (Internet browsing and utility programmes such as text processors, spread sheets, web page design), to be offered to primary and secondary school teachers through the national portal educ.ar. Third, courses in the field of administration were also developed, such as human resources administration and others.

Moreover, the UVQ programme will launch, during the second half of 2001, a three-year secondary school programme for adults, which has been welcomed by the public since 73 per cent of the population between 25 and 64 years of age has not completed secondary school.

In 2000, the virtual university community was made up of 2,384 undergraduate and postgraduate students who take full university programmes through the off-campus, online education system. In addition, a variable figure of approximately 300 on-campus UNQ students take some courses through the virtual education programme.

The UVQ forms a pluralistic community whose demographic structure has some special features as compared to a more conventional university student population.

A true advantage of the virtual university programme is that it is not limited by space constraints and can offer its courses to people anywhere: students taking undergraduate and postgraduate courses through UVQ reside in all Argentine provinces and there are even some students who live abroad.

The socio-demographic characteristics of UVQ-programme students reveal an original university community. While most UVQ students are between 30 and 50 years old (the average age is 39.4 years), the age spectrum is very broad, ranging from 22 to 77 years.

The majority (67.1 per cent) of UVQ students are women. Moreover, 61.7 per cent are married and working.

Most UVQ students are employed; in fact, 89 per cent work regularly, which is 35 percentage points above the figure recorded for Argentine universities as a whole (including UNQ on-campus students), according to the 1994 University Census.

While figures vary with regard to the extent of the previous higher education that students have received when they are admitted to any of the UVQ programmes, in no case is this less than two years; the weighted average of the years of higher education that UVQ students have received before admission is 3.43 years. Some 56.2 per cent of UVQ students have four years of previous post-secondary education, mainly in the non-university higher education system.

The UVQ student-teacher ratio is the same for all subjects, except for the introductory course, which is common to all university studies. The UVQ has determined that all of its virtual classrooms will have a maximum of fifty students per teacher, while in the introductory course the ratio increases to seventy-five students per teacher-consultant.

Unlike the teachers in the UNQ face-to-face education system, teacher-consultants in the virtual university programme do not have permanent positions; they enter into a relationship with the UVQ programme for fixed periods of time equivalent to the scheduled duration of the academic activity. They earn a salary equal to that of a full-time Associate Professor in the face-to-face education model. Unlike the latter, for UVQ teacher-consultants the total salary does not include research. Furthermore, their contractual situation does not require them to be on the university premises; on the contrary, teacher-consultants work in a way that is similar

to tele-working. They only have to attend at least one meeting at the beginning of the academic year, and administer and correct tests at a maximum of two examination boards.

There are seventy-three active virtual classrooms, with a staff of sixty-one teacher-consultants and seventeen tutors. Faculty members may be in charge of up to two classrooms at the same time.

UVQ faculty members are recruited through public notices in the national mass media. This has enabled the UVQ to work with teachers who, like their students, are spread across Argentina. However, it is worth pointing out that the selection of teacher-consultants is not formalized through an 'academic career system' as in the face-to-face education model of conventional universities.

The development of UVQ teaching activities lasts approximately eighteen weeks, with three weeks more for teachers who join the programme for the first time. In this case, the UVQ deploys a teacher training and instruction programme for asynchronous virtual environments. In general, the teacher devotes sixteen out of the eighteen weeks to the development of the specific course contents, and two weeks to general examination drafting and correction tasks, working approximately fifteen hours a week.

As detailed in Section 4.2 below, UVQ faculty members have postgraduate degrees in their field. However, given the unprecedented characteristics of this programme, the existing teacher-consultants did not have specific training per se in off-campus education through virtual environments.

Because of UVQ's particularity, it is necessary to generate a teacher profile with unique features that fits closely with the multimedia and telematic environments where the teaching activity takes place. An ad hoc training and instruction programme for teachers is key for this kind of venture to succeed.

To that end, a systematic staff development programme should be defined that guarantees teaching-quality improvement and that, with respect to such improvement, joins with research proposals on the topic being developed. This will allow an academic career specific to this environment, which guarantees a stable staff policy, consistent in time, subject to periodical quality assessments, with highly skilled scholars, capable of leading and meeting the strategic objectives of the UVQ programme.

Determining remuneration consistent with a staff hiring policy and with a performance-assessment system should also be taken into account.

UVQ started operation in 1999 with only one undergraduate degree (in education), and 273 Bachelors in 'Educational sciences' have graduated. It will not be possible to draw conclusions on the UVQ programme performance in terms of the graduate/new student ratio since the programme has more than two starting dates for the annual academic cycle.

3.   Administrative issues

3.1   Administration

The administration and management of the UVQ require the development and implementation of new structures and procedures, different from the ones applied in face-to-face education at the UNQ. As an example, the cost-free basis of undergraduate studies under face-to-face conditions and their costly basis under virtual conditions implies that the allocation of a virtual classroom to a registered and admitted student is mediated by his/her enrolment (payment of fees), an administrative procedure that does not exist at the UNQ.

The management of the UVQ differs significantly from that of the face-to-face education system. As analysed under Section 2.2 above, the UNQ decided to establish an ad hoc[8] organizational structure. The UVQ collegiate government bodies adopt the decisions to be implemented by the enforcement bodies. The relationship with the UNQ is demonstrated by: (i) the authorization by the University Superior Committee to create an undergraduate and/or postgraduate course of studies; and (ii) UNQ's management of the partial funding granted by the university to the UVQ. Except for these two interactions, all UVQ academic and support activities are independent of the face-to-face education system of the UNQ.

The UVQ's main operational problems were detected in the support processes, particularly in the lack of information technology systems for the academic, economic and financial management of the UVQ (under Section 3.4 below they are referred to as back-end systems).

Key academic processes had a less difficult time adapting to the new virtual environment. Both the academic experience of the UNQ and the technical assistance of the UOC contributed to the resolution of common problems in this field. On the other hand, no experience on support processes such as management of student fees collection, allocation of classrooms, relationship with the Internet server, among others, was available.

Students have been very critical of the services rendered by UVQ regarding the teaching-learning process. Sometimes there were difficulties in accessing the Internet and others felt that at times fees were charged in error.

The UVQ initially focused on the key elements concerning the faculty, educational aids and communication tools, among others. The most useful lesson is that key and support processes should be tackled simultaneously in order to avoid bottlenecks, which are difficult to resolve when academic activities are in process and the increase in the number of students is exponential. As analysed later on in Section 3.3, back-end systems are under development to migrate gradually from a traditional management structure towards a management model consistent with a virtual and open organization.

The second lesson is that the creation of a related business company for the management of the UVQ programme propitiated the incorporation of higher accountability standards as compared to those of the face-to-face education system. Nevertheless, this falls under objective and opposing restrictions, particularly for a 'bimodal university' whose

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[8] The Executive Director/General Manager position does not exist at the UNQ and does exist at the UVQ. A similar position at the UNQ, in the face-to-face education system, is held by the Planning Vice-President.

administrative and academic management structure has only been devised for a face-to-face environment. Thus, the emergence of tense situations between both administrations is unavoidable, giving rise to misunderstandings, which are gradually being overcome due to the transfer of management processes already deficient in the face-to-face environment.

The UVQ's administration and management demand the development and implementation of structures and procedures different from those usually applied to face-to-face education. Another important characteristic of the virtual environment is that the academic product or activity should not only be of top quality and excellence, but also financially self-sustaining.

This is the reason why modern concepts applied to the field of business administration and organization, such as 'virtual organization' and 'open organization', should be the guidelines of a programme such as the virtual university programme. UVQ-type organizations are based on flat structures with interconnected operating teams.

The success of these programmes lies in designing management strategies not just conceived as a simple exchange among closed compartments with no communication among them. On the contrary, information, including both routine and ordinary data and the global values and viewpoints of the business, should flow through in-house cooperation and circulation networks, among management agents with a high capacity for rotation and adaptation to constant changes.

A virtual university – that is, an institution of higher education incorporating new information and communication technologies to attain its fundamental goals – cannot face this challenge without also incorporating such technologies into its management and administration systems. Thus, the administration and academic management processes should be strongly based on the use of information technology systems for the production and flow of information.

The UVQ originally conceived its end-to-end processes of academic administration and knowledge management, taking to the virtual environment what it has done for years under the face-to-face educational system. Nevertheless, within the framework of a virtual organization made of flat and open structures and committed to the education of individuals (undergraduate and postgraduate courses of study), not only the knowledge management associated with learning should be taken to the virtual environment. To become a true 'virtual organization', those activities that are not necessarily directly connected with the processes of teaching and learning should also be held under distance conditions in order to become a true 'virtual community' operating in the areas of education and generation of knowledge.

With the virtual community having been organized as such, it can be concluded that the success of its management depends on the analysis and satisfaction of the expectations and needs of the following: (i) the organization itself (i.e. coordinators, teacher-consultants, managers, technical back-up); and (ii) the students.

According to Cabrera and Martí (2001), virtual and open organizations focus on four issues concerning their operation: 'safety, knowledge management, Customer Relationship Management and Datawarehouse'.

For the purpose of ensuring the safety of the virtual organization it is necessary to develop systems of authentication and control of access to the campus, and services guaranteeing the integrity and confidentiality of data.

The end-to-end knowledge management requires model-development tools for the identification of its sources, such as process re-engineering and workflow tools. It also needs tools enabling the storage, selection and retrieval of information through intelligent agents. Finally, knowledge management requires tools that facilitate the management of resources and services (human resources, back-up, etc.).

There are three phases of Customer Relations Management, that is, solutions to improve the service rendered to customers: (i) marketing, sales and service activities linkage; (ii) customers' data analysis for the purposes of identifying market behaviour patterns and identifying demand behaviour patterns and their satisfaction; and (iii) the strategic or action phase, where the organization's structure must be adapted according to the knowledge of the customer obtained from phase (ii).

Datawarehouse is the study of the users' and the organization's behaviour patterns which is aimed at detecting opportunities to improve decision-making. Information must be accessible to all members of the virtual organization. When referring to the interests of students, the idea is to provide solutions on a personalized basis to their particular expectations, in other words, their concerns and interests before they became active students, and those appearing later as they study within the framework of a virtual environment. In both cases, data generated and processed must be logically sequenced in terms of the personalized expectations of the student-user.

As regards potential students, a key factor for any educational offer is to include guidance services that provide information on activities. These services should also be capable of collecting individual information, such as data on personal preferences, skills, prior education, professional or work environment and time availability.

As for students in the virtual community, they should be able to obtain as much automated information as possible. Other virtual communities that are already consolidated, such as the UOC, user tools such as FAQs (Frequently Asked Questions) and also a Help Desk, a service enabling the resolution of questions on an automated basis under predetermined terms and conditions. Both services require a database specially configured for such purposes. Finally, the prospect of rendering a twenty-four-hour service throughout the year, also in connection with activities or formalities beyond learning, implies that once the students have become acquainted with the automatic data-processing system flowchart, they may 'self-manage' their permanence in the different virtual campus areas.

3.2   Costs and financing

The UVQ is funded through the contributions made by the students to Campus Virtual SA and a grant by the UNQ, whose partial participation in the total funding is gradually decreasing.

At the beginning of its educational activities, the UVQ established a system according to which students were charged per course. During the year 2000, that system was replaced by monthly payments, which has led to improved financial follow-up.

The UVQ students must hire the services of Campus Virtual SA for a set of technical services including: connection to the Internet, help desk (telephone assistance twenty-four hours a day throughout the year), tutoring, creation and delivery of educational aids, including bibliography. The fee for the Bachelor's degree in 'Educational sciences' is US$40 per month

throughout the year, and for all other undergraduate and master courses of study it is US$80 a month.

Therefore, the services that Campus Virtual SA provides account for a substantial part of the UVQ's current expenditures: economic and financial management, hiring of Internet access, payment of royalties for the licence to use the automatic data-processing system, compensation for technical assistance rendered by the UOC and payment to tutors.

With a fixed annual allowance, the UVQ assumes responsibility for hiring the authors of the educational material, payment to faculty members, academic management of the programme, investments in equipment, server-maintenance expenses under the housing mode, and marketing expenses (advertising, press, participation in exhibitions, brochures, etc.).

As the number of UVQ students increases (and since Campus Virtual SA is a subcontractor of UNQ) the income obtained from UVQ will cover not only the non-faculty expenses but also more of the expenses now assumed by UNQ.

It should be mentioned that the determination of the monthly fees that UVQ students pay was not subject to a thorough cost-benefit analysis, but was determined by taking into account the fees charged by Argentine private universities; UVQ fees were then set at the lower end of the scale.

This 'price policy' was essentially due to the cost-free nature of the UNQ, and subject to basic university policy as defined within the framework of the Argentine university system.

In terms of total expenses per student, the UVQ is well below the cost of face-to-face education at the UNQ. While the cost per off-campus online student amounts to US$1,200 annually, the on-campus student has an approximate cost of US$3,700. Even though infrastructure investment costs and expenses in R&D of a university in its first development stages should be subtracted from the latter value, in net terms the value per on-campus student is the same as that of a UVQ student.

The challenges for the current fiscal year and the years to come are to improve the collection system, introduce credit cards for payment of enrolment fees, and introduce postgraduate funding strategies through arrangements with financial institutions, which as is customary in developed countries, where banks and other institutions provide financial aid to university education.

One of the most important lessons is that the creation of new academic programmes should derive, among other things, from an economic and financial analysis, without implying that a project should be considered only from an economic viewpoint. In fact, feasibility studies and the advantages of expanding the academic offer must include agglomeration economies, which entail new courses of study within a given field of knowledge where the university has some potential, and provide for a fee covering overheads and initial investment expenses (break-even point and marginal contribution analysis).

Since virtual education demands higher initial and start-up investments than face-to-face education, the economic feasibility of virtual academic programmes entails a necessary minimum number of students.

A greatly diversified academic offer with few students in each programme acts against the attainment of positive economic results, and the same applies to excessively open curricula, which contradict trends towards flexibility.

Three years after its creation, the UVQ systematically began to subject all new potential educational offers to a strict economic analysis, which is not at all the case for face-to-face university programmes. In this sense, the UVQ has had a beneficial impact on the way face-to-face education works at the UNQ, as the university is now devising its academic policy on a stricter basis.

The UNQ has not been unaware of the dominant practices in the Argentine university system: it follows Say's Law of Markets, which would explain that the academic offer creates its own student demand. Argentine universities are basically a community of professors and assistant professors, more than a community of students. Academic opportunities thus reflect the preferences and viewpoints of faculty.

Within a virtual environment, such as that of the UVQ, such practices are not as relevant as they were in the beginning. Nevertheless, it should be acknowledged that the face-to face model was partially transferred to the virtual model, particularly face-to-face educational programmes, which is not necessarily the best option.

Currently, the UVQ devises its academic offer independently of face-to-face policies. In fact, the UNQ is basing its institutional policy on the joint but differentiated consideration of its two modes: face-to-face and virtual education. In just a few years, the UNQ will probably have the same number of face-to-face and UVQ students.

As far as costs and financing structures are concerned, we concluded that: (i) a virtual university is like any other economic activity as far as the best management practices are concerned, such as outsourcing, subcontracting, differentiation of cost units, marketing, loans, etc.; and (ii) it is advisable to have a company to take care of the technical aspects of virtual education and training (although in the case of the UVQ it was due to political and public management restrictions imposed by the central government). This is a sound institutional policy because it inevitably sets criteria typical of private management practices.

3.3   Technological infrastructure

UVQ has its own servers, which house the database. They are set up, maintained and administered by the company rendering Internet services (housing).

The Campus Virtual software is provided by the UOC through a non-transferable and non-exclusive licence. The platform that the UOC has granted to UVQ under these licence conditions belongs to the front-end functionality of the system, which supports communications in the learning environment among the different members of the educational community (i.e. students, faculty members, tutors, coordinators, etc.). It also supports communications in the social environment of the 'campus' (i.e. mail, chat, bar), and in the general support-services environment (library, institutional messages, etc.). The Campus Virtual platform functions within the web environment and may be accessed through different navigation systems. It is codified under CGI/Perl and runs under Sun Solaris. The database is Oracle and the operating access interfaces for the general management system (back end) have been custom built.

The Campus Virtual's associated systems, that is, the back end, were developed by another UNQ-related company (see below), and provide support both to academic and administrative management applications. The database is integrated with the front-end database through appropriate connections and may be any standard relational base of the industry (currently there are implementations in Oracle and SQLDServer). The development was based on a first stage that included survey, analysis and processes re-engineering. This stage took approximately three months and it was possible to redefine and document the main set of processes in a Petri web-based format for easy implementation. Then it was possible to codify programmes within a conceptual framework shared with users. From the technological point of view, the programmes accessible through the web were developed with front-end compatible technology, while the customer-server programmes were developed with Virtual Basic.

The decision to offer web connectivity as part of the educational service was due to the insufficient development of the Internet in Argentina. Providing access to the web together with a Help Desk (technical service twenty-four hours a day throughout the year) was considered a strategic issue. So much so that the UNQ's company, Campus Virtual SA, purchased shares in the ISP that was rendering connectivity services and held approximately 30 per cent of the capital stock of that company.

After the full deregulation of the communications market, the UNQ's strategy was to sell Campus Virtual's share in the ISP. This was accomplished in an international operation that resulted in substantial profits for the university.

During the last quarter of 2000, the university created a company for the development of virtual education software – Sistemas Virtuales SA – which is currently developing all the systems. For these purposes, the Fondo Tecnológico Argentino (Argentine Technological Fund), a state agency that finances technological innovation, gave the UVQ programme a US$300,000 non-refundable grant for the development of back-end systems and automatic data-processing systems.

Sistemas Virtuales SA is thus developing both the front-end and back-end functionalities of the systems used by the UVQ programme. The front end supports communications within a learning environment similar to the UOC Campus Virtual. Due to the design of this platform, the decision was made to provide it with integrated multi-field facilities so that in just one implementation it will be possible to run different virtual campuses simultaneously, and also share virtual classrooms. This means that students from different institutions can attend the same virtual classroom, each of them within his/her own virtual campus. Likewise, the platform was provided with intuitive and agile interfaces so as to minimize navigation. The system is encoded in ASP-type programmes using PerlScript, and it is compatible both with servers running Microsoft's Internet Information Server under Windows NT, and Apache under Linux.

A three-layer implementation was adopted for the whole system, separating the database manager from the business rules and from the visual interfaces. This facilitates the system's adaptation and maintenance. A component-based approach for interfaces has been adopted so as to maximize and simplify the reutilization of components. Coding resides in a unified database so as to keep good configuration control and facilitate systems maintenance.

The UVQ already has an automatic data-processing system prototype (internally known as Notredame) and has begun its 'personalization' in the e-learning area with customers associated with the UVQ, such as professional boards and business chambers, among others.

Several conclusions may be drawn from this experience with regard to how things should be done. The case of the UVQ is characterized by the restricted development of the Internet in Argentina. This was the reason why we did not follow the UOC's experience of releasing and separating access to the Internet from the educational service. In hindsight we believe this was the right decision.

As for the decision to take part in the ownership of the company rendering Internet access services, the outcome is less conclusive. From an economic viewpoint it was an excellent investment. In terms of quality of service, there were technical problems that were difficult to resolve due to our shareholder role (between an Internet provider and the UVQ as customer). Although different positions may be adopted, if the aim is to provide good educational services, investing in the ISP sector may not necessarily be a good option for a university.

The creation of Sistemas Virtuales SA for developing systems for front-end and back-end functionalities has been an excellent decision that gives the UVQ and Sistemas Virtuales SA international standing in state-of-the-art technological development.

3.4   Intellectual property ownership and copyright

The UVQ has the copyright of all the basic teaching materials that are used to support each course (work file). The authors are paid a lump sum, which entails a significant initial investment in exchange for the authors' copyrights on the work files. An alternative would have been to follow the UOC's experience, paying the authors a royalty on a monthly or course basis, per student.

On the other hand, no copyrights are recognized for the digitalization of bibliographies, since such reproduction is partial and restricted. Reprography is a widespread practice in the Argentine university system which causes economic hardship for authors and publishers and, although reducing educational expenses, also makes students less familiar with textbooks.

The UVQ recognizes copyrights on digitized bibliography and negotiations are held with the Book Chamber, an organization grouping publishers.

As far as the Campus Virtual software programme is concerned, the UVQ recognizes the UOC copyright and pays royalties for the licence of use, which includes access to modifications and updates.

4.   Academic issues

4.1   Programme development

Replicating the UNQ, the UVQ programme bases its academic organization on the grouping of related disciplines by field of knowledge, and basically focuses on undergraduate studies, offering only one Master's degree programme. One of the particular aspects of the UVQ's programmes is their emphasis on social sciences and business administration sciences, with an occupational profile that is not available at other national public universities.

The strategic decision to offer these courses of study was due, in the first place, to the need to satisfy the educational demands of a public that, because of its demographic and sociocultural characteristics, could not gain access to the conventional offers of the Argentine university system.

For the UVQ, the design of subject areas that overlap requires a flexible management academic organization. Thus, the UVQ curricula were designed on the basis of circular curricular models with a wide range of free choices for students, who are accompanied by a tutor. Except for the University Technician's degree in 'Business administration sciences', the offers of the UVQ programme are complementary study cycles or second-level Bachelor's degrees. They require that the students have prior academic experience, either holding a degree or having taken a minimum number of courses (fifteen) approved by the university system (see Section 2.3 for details).

4.2   Teaching

Academic management of UVQ is the role of coordinators attached to the Academic Office. They are responsible for developing the different processes that shape each professional or management area: teaching, tutorship, academic communication, assessment and processing of educational materials. The Academic Office is composed of a Director and a Deputy Director. Both are permanent employees of the university and are appointed by recommendation of the Vice-Chancellor.

The Director's role is to deal with the integral academic management of UVQ, which includes following and evaluating the performance of the academic coordinators in the delivery of their academic input; organizing curricular programmes, and coordinating their delivery with the management company (Campus Virtual SA) and the technical support (ISP) company; and informing the Chancellor, Vice-Chancellor and the Upper Council on developments.

The Deputy Director of the UVQ deals with all that relates to the coordination of academic units. He/she supervises the provision of information on the delivery of the UVQ programme and the production of statistics, and is responsible for the execution of the academic calendar. Together with the Director he/she recruits academic personnel and selects authors for the creation of work files. Finally, he/she assists the Vice-Chancellor's Academic Affairs Office in verifying course plans and overseeing the awarding of degrees and diplomas.

Teaching is carried out by teacher-consultants, who have a contract limited to the duration of the courses they teach. They develop the content proposed in the work files by the specialists

in the respective subject areas, and on a weekly basis they outline proposals and guidance for the development of learning processes in what is called the virtual class. They depend on the coordinators of disciplinary areas.

The virtual class consists of the teacher-consultant transmitting to the students the key elements of the work files and the compulsory bibliography, according to the sequence of a Work Plan which is presented at the beginning of the course or subject. The students must develop skills that will enable them to interpret these texts with a view to producing their own texts. The Work Plan is a 'contract' between the teacher and the student which permits planning and organization of work in the virtual class. It helps students to understand the development of the course or subject from the first day, so they can plan their studies with certainty and precision.

The virtual class, which lasts a week, begins with a written communication (usually in the form of an attachment) that the teacher places in a space of the Campus Virtual called 'Teachers' Notices' at midnight of each Thursday, so that students can study over the weekend. During the following days there are exchanges, discussions, and consultations between students and the teacher in a space called 'Discussion'.

In the virtual class, the teacher-consultant formulates the content developed in the educational materials and the compulsory bibliography, relates the content to preceding and subsequent materials, proposes activities for the analysis of subjects dealt with in the course, proposes problems for reflection, proposes discussions around a study of the bibliography and communicates updates relating to the subject matter.

The UVQ is based on the concept of knowledge as a construction, linked to a conception of cognizant subjects who interact within a shared social context. The act of teaching is conceived as a space for collaboration, a mental process of construction and reconstruction of knowledge carried out by each student, within a collective framework especially designed for this purpose: the virtual class.

Tutorials are one of the critical functions of the UVQ programme. The tutors are responsible for accompanying students throughout their entire academic lives. They provide permanent input to the teacher-consultant on the one hand, and to the academic management on the other, so that the best strategy to retain students in the UVQ programme can be designed.

Within traditional distance education systems the roles of tutor and teacher are combined. Within UVQ, the person and role of the tutor are separate from that of the teacher-consultant, although they complement each other. Tutorial action is defined within a model of general guidance. It should be clarified at this point that the figure of the tutor thus described, especially with regard to UVQ, represents a recent change in the Argentine university system that resulted from the academic reforms of 1997.

The general guidance tutorial model coordinates different institutional dimensions, while dealing with organization and curriculum. In the case of UNQ, and especially the UVQ programme, a tutorial system of this nature is justified when an open structure curricular education model is in use with a high degree of electivity on the part of the student.

The aim of the tutorial system is to guide students in the development of their education within the university. The students' education is constructed by taking into account their different educational situations and needs throughout their course of study. These in turn will

be connected with other experiences that affect the students' professional development, and that take place outside the university environment. The tutor is thus a person with whom the students can discuss and design their educational plans according to their interests and progress of their studies.

Both the teacher-consultants and the tutors are university graduates. The teachers have postgraduate degrees in their areas of competence and carry out research within UVQ or other universities or research institutes. The tutors, on the other hand, have professional experience and a university degree, preferably a postgraduate degree, involving research.

The academic management coordinators are academics with postgraduate studies, who have current knowledge of their field and conduct research. In particular, the academic management coordinators of each professional area supervise the overall work done by the coordinators in their respective disciplines and, with their assistance supervise, the Work Plan of the teachers, implement it and coordinate the work of teachers and tutors.

The academic management coordinators in charge of the Units of Communication, Assessment and Didactic Processing, however, have different responsibilities; they coordinate transversal processes common to all areas, thus ensuring uniformity in the global methodological profile of the UVQ programme.

The Communication Unit is in charge of coordinating and managing the production and circulation of information within the UVQ programme (from statistical data, to ensuring the best means of access to academic content by students). Furthermore, the Unit moderates and promotes public exchange forums, produces informative material on the development of the UVQ programme, adapts the Campus Virtual platform for best use in each programme of study, and designs and audits the communication processes that shape and allow the constitution and development of the UVQ university community.

The Didactic Processing Unit coordinates the design, editing, production and printing of UVQ educational materials, and the digitalizing and production of educational multimedia and hypermedia materials.

The educational materials (i.e. paper copies of the work files or CD-ROM multimedia support materials) are produced by renowned academics, who are solicited by the university for this purpose. The academics (equivalent to the highest teaching category) develop the content of a course or specific subject through a set of theme units with proposals for teaching and learning activities.

The educational materials (paper or multimedia) constitute the central axis for teacher intervention. Their aim is to teach and they express a pedagogical proposal, even though the teacher-student relationship is essentially developed through written communication in the digital medium.

The Assessment Unit establishes assessment criteria, coordinates the production process of examining tools and evaluates their application. From an organizational standpoint, it ensures the constitution of examining bodies in different parts of the country depending on student registration, and develops management tools for this purpose. It coordinates the accreditation of UVQ students, organizing and systematizing information on the academic performance of each student.

A distinctive aspect of academic management of the UVQ is its unified learning-assessment policy for all educational proposals. The Assessment Unit, together with the career and subject area coordinators, produces generic assessment instruments and procedures making it possible to ensure the quality of these tools and their methodological and content consistency.

In all institutions of the formal education system in Argentina, assessment and accreditation are related and coexist. Assessment informs on the ability and knowledge of the students, and accreditation represents the institution's certification that their assessed knowledge qualifies them for promotion, whether within the institution itself or to a higher level within the education system. The final examination thus acquires relevance for the UVQ programme, as this is the only instance throughout the course when the student's presence is required, and when a written record with documentary value is produced, providing proof of each student's identity.

Universities that offer distance learning have had to make considerable efforts in order to be considered as providing education that is comparable in quality to that provided by face-to-face systems. For this reason there has been an emphasis on requiring the students' presence for assessment. While in other aspects of the education process (e.g. educational materials), distance learning higher education institutions have been very innovative and the first to make use of technological resources, as regards assessment the tendency is still to respect university tradition because certification and accreditation of the students are carried out in person.

The availability of the academic programme is based on a flexible and open model. Whereas in the traditional face-to-face system the calendar of activities follows the traditional division into two academic semesters, in the UVQ programme there are five teaching periods. Thus, students can choose, according to their time preference and availability, the best moment to begin the course. The same follows for the administration of final examinations: they are held on five occasions during the year and take place in eight different centres throughout Argentina.

The delivery of UVQ's educational offer, both in its academic and administrative dimensions, is subject to continuous monitoring and assessment through surveys circulated to students, as well as evaluations of the academic programmes that are carried out periodically by external experts. The latter are drawn from the Academic Degree Council, which comprises professors and researchers of outstanding academic achievement in their field. They issue opinions on matters such as curriculum design and study profiles, relevance and consistency of study plans, minimum content of courses, educational materials, and any other matter submitted for their consideration by the Academic Board of the UVQ programme.

4.3   Learning

Campus Virtual is a logical and comprehensive software programme that provides the means and the environment for the UVQ. It is where all the conditions, spaces and procedures that make up and surround the teaching and learning processes in a higher education institution are recreated. It is, at the same time, a complex space where each and every place and service typical of a university campus can be found, redesigned and retrieved under the virtual setting's own logic. In this sense, dialogue-based options of the virtual frame and interaction have been specially developed in terms of point-to-point (typical of the distance education experiences), point-to-group and group-to-group possibilities. This variety of technological possibilities for social relations is added to the clearly stated institutional intention of

transforming interactivity into interaction. Thus the UVQ becomes a virtual academic community with an influence on the everyday worlds of each of its members.

From the very beginning of the UVQ programme, emphasis was put on the creation of plural spaces that can overcome the limitations of a web page, since the challenge is not the transference of the existing contents to the HTML language, but the creation of original contents in a virtual model in which the time and place of study is chosen by the student, who is the true subject of the learning process.

The UVQ programme produces educational materials which are the basic theoretical reference of the courses. Unlike traditional distance education courses, learning materials for the UVQ programme are not self-sufficient, and are very much linked with the contents developed throughout the subject course. These materials are mailed to the students as work files, and complemented by the compulsory bibliography, the multimedia material and the courses' contents.

There is an aspect we consider essential here: a change in the quality of the learning processes. In the particular case of the UVQ, the transformation becomes so visible that, unlike traditional universities where pedagogical activities are teacher-centred, our programme can be identified as a 'university of students'.

In the virtual class, the teachers are not the only ones in charge of education. On the contrary, it is a complex model of which the authors of the educational material (whose profile most resembles that of the professors in face-to-face education), the classroom teacher-consultants, the tutors and the academic management coordinators are all a part.

As was stated earlier, it is not just a question of transferring traditional teaching to the hypermedia or of simply cutting out distances, but rather a matter of creating new models of knowledge acquisition and knowledge building. In that respect, the UVQ model specially emphasizes cooperative learning.

With the combination of the interactive framework, which is basically asynchronous, communication between teachers and students is promoted; this guarantees a high level of freedom for students in the administration of their time and place of study. In virtual classes, everybody shares material and information resources, and the teacher is the pedagogical mediator who guides and reinforces the students' initiatives as he/she implements strategies to increase collaboration and associated work. The teacher's main role is to encourage the students to learn and think, and not to impart knowledge: teachers promote the dynamics of the collective intelligence of the groups they are in charge of.

5. Cooperation

As we have repeatedly stated, the UVQ was born as part of a technological and pedagogical association strategy with the UOC. This allowed the UVQ to save time by postponing internal technological and pedagogical efforts and incorporating a university experience from a European country.

At the same time, UVQ entered a strategic alliance with an ISP organization in order to be able to provide connectivity to the Internet together with the virtual education service.

Today, the UVQ focuses its strengths on the pedagogical model in the virtual environment and on systems development, both platform (front end), or application systems (back end). As for educational contents, the UVQ's strategy is to establish joint ventures with other universities, from Argentina and abroad.

Recently, the UVQ entered into two academic partnerships with other institutions: the first is with an Argentine university institute specialized in health educational programmes (ISALUD); and the second is with the UOC. A postgraduate course on 'Health services management' will soon be offered in collaboration with ISALUD; the classes of the business administration technician's degree have already started in collaboration with the UOC; and the classes of the multimedia technician's university degree are now being offered.

In both cases, the educational programmes – as regards curricula and contents for each subject – belong entirely to the associated institutions. ISALUD and the UOC appoint their teachers for the health course and the multimedia degree, whereas in the case of the business administration degree, the UVQ appoints its teachers. In both programmes with the UOC, the UVQ also incorporates the tutors. As to the economic and financial management of the programmes, ISALUD runs its postgraduate studies and the UOC runs the multimedia degree. On graduation, students receive two diplomas: each university granting a degree for the academic studies that were completed.

UVQ's association with other institutions has highlighted the following: (i) UNQ's permanent policy to enter into partnerships with other institutions; (ii) UOC's disposition to transfer its know-how; (iii) the error of creating exclusive associations, in the sense of seeking an exclusive partner (both in academic and technological matters); and (iv) the immaturity of the Argentine university system in adapting to to new challenges in education, virtual education and technological change, and in following a strategy of association.

In the future, it will be important to: (i) increase inter-university cooperation, both nationally and internationally; (ii) avoid being dependent on exclusive suppliers of any nature; and (iii) foster network configuration to enable the exchange and transportation of multiple offers.

The last recommendation is undoubtedly linked with all the others. It is necessary that we imagine a new phase in virtual university education development. The greatest difficulties are within the universities themselves, not in the availability of technologies. Most of the educational contents on the web are not related to the progress of the ICTs. Broadband, with its impact in terms of speed to visualize high-quality compressed videos in real time and incorporate sound similar to the CD, as well as load and unload indexes in seconds, leverages

the possibilities of applications of a greater added value. However, education systems are still too conservative, fearful and doubtful to enter the field of virtual education.

Universities are slowly introducing virtual courses for their on-campus curricula and educational programmes, and a few of them have started to teach undergraduates within a virtual frame.

The configuration of an inter-university virtual education network should be the challenge for the near future. The web could replace the individualistic approach whereby each university tries to master all the educational contents and have its own technological platform.

In a globalized context, ICT allows universities of the developed countries to export their educational proposals to the emerging countries through the Internet. Trying to compete individually is not possible. This means that it will be necessary for each university to share its strengths and to cooperate in order to collectively solve structural weaknesses.

Access to a virtual campus does not have to be a problem, and permanent upgrading of support technologies does not have to be a barrier for receiving a virtual university education. Even the creation of virtual classes with teachers and students from different universities will be possible. These students will visualize on their screens a personalized campus within the context of the university they are enrolled in.

In a restricted domestic financial context, national and international cooperation in virtual education will be of key importance.

6.   Future development and institutional change

In the short run, competition in the virtual higher education market with other Argentine public and private universities, along with universities from abroad, will increase. The rapid expansion of ICTs will eliminate technological barriers and facilitate the entrance of new educational offers. Moreover, the tendency of big international companies to internalize not only R&D activities but also training and education programmes, is likely to limit the university higher education open market.

The UNQ's institutional policy to strengthen its bimodal (face-to-face and virtual) educational model guarantees institutional stability in the mid-term, a necessary condition for the growth of the UVQ programme. In a sense, the UNQ is a good example of how public universities can deal with globalization and open borders: use criteria strictly based on merit for admitting and retaining students; develop R&D activities in areas of knowledge where the university has started educational activities; offer academic programmes that are up to date and in tune with the current demand of the economic and social sectors; incorporate modern information and communication technologies, and show innovation with regard to education models, by proposing, for example, activities such as tele-teaching.

The innovative experience of the UNQ and UVQ programme has drawn the attention of the media: quite unexpectedly, this experience shows that an Argentine state university can effectively deal with the challenges public universities face. The UVQ's future development will focus on the creation of strategic alliances, joint-venture agreements, subcontracting of additional services, organizational flexibility, high-quality graduate and training offers, and an educational portfolio of its own as well as of third parties.

7.   Policy development, planning and management: lessons learned and recommendations

With regard to institutional policies, the UNQ experience illustrates that innovative enterprises such as the UVQ call for boldness and creativity on the part of the university's highest authorities. The leadership and talent of UNQ's President, Julio Villar, and the high calibre of the Vice-Presidents have made possible the development of a modern university within a public university system that offers more limitations than opportunities. In short, institutions often bear the imprint of the people who lead and manage them.

The management system of the UNQ has been another positive factor for change and continuous improvement of the university. The students express a strong political adherence to different parties which works against a more academic approach and greater awareness of social change. The university government of Quilmes makes a clear distinction between the roles of the Superior Committee and those of the Board of which the President and the Vice-Presidents are executive members.

In addition the UVQ programme is part of a series of structural reforms that started during the second half of the 1990s: academic reform, reform of the teachers' labour law and reform of the university government system.

The decision to create a private company to manage the UVQ programme was wise. This facilitated the introduction of modern management and accountability methods, and made the management of this new and very complex programme more flexible and responsive, especially when coordinating the very different parties, involved: academics, ISP, Campus Virtual and application systems.

While the UVQ is not a good example of advance planning, it is a good example of 'learning by doing' and of 'catching up'. Methods were adapted and improved, and best management practices were introduced so as to be able to focus on continuous improvement. The decision to invest in the ISP had an excellent return compared to the high risk taken (we invested in a small domestic ISP), and helped to provide a good educational service along with Internet connectivity in a local context where access to new ICTs is difficult.

Notwithstanding the advantages of learning by doing, it is advisable to do a feasibility study before launching each educational product; in particular, at a minimum a market analysis is essential, as education under virtual frames requires great initial investments, which can only be recovered with a large number of students (at least 300) per group. It is also advisable that bimodal universities – that is, those based on a face-to-face model but also offering virtual education programmes – do not automatically transfer the face-to-face educational programmes to the virtual frame. A 'fine tuned' educational offer implies that the face-to-face and virtual academic programmes it proposes are differentiated, even though they may be related.

With regard to government educational policies, it is essential to create a minimum regulatory framework for distance education (the virtual environment would be one kind of distance education although, strictly speaking, online education has no 'distance'). While the government must in some way guarantee the development of educational institutions and

ensure their quality, the emphasis of the regulatory framework should be placed not on requirements per se, but on the evaluation of the quality of the processes and their outcomes (i.e. graduates). In light of the new ICT, governments should not be prejudiced against virtual educational programmes when they are examining them. The previous distance education model, based on mail and paper, did not allow the kind of teacher-student interactivity that is possible through the Internet and Campus Virtual, which seems to be even better than that of the conventional face-to-face education system.

As for management, the main difficulty has been the staffing process for an educational enterprise as innovative as the UVQ. Specialists with experience in the private sector, in marketing for example, are not acquainted with the codes and routines of educational institutions that work on a mid-term basis; moreover, the UVQ programme does not consist of short-term training proposals that involve the student's loyalty to the institution. An undergraduate or postgraduate university student taking a virtual education programme will be studying for a continuous period of no less than two years. On the other hand, education specialists of traditional universities find it difficult to adapt to private management and to incorporate practices and values inherent to market transactions.

The UVQ made an important management mistake: it did not simultaneously incorporate back-end systems with the Campus Virtual platform. While students were studying via the Internet, the UVQ worked almost manually on academic and financial management. The solution to this problem was found by the end of the year 2000.

In order to generate trust in the UVQ programme and attract students to it, the UNQ launched, in the first part of 2000, an important, though costly, advertising campaign that positioned the 'UVQ' trademark as being synonymous with university learning through the Internet. Although there is no consensus at the UNQ on whether the decision to invest so heavily (around US$500,000) in the campaign was appropriate or not, communication and marketing campaigns are highly recommended. Such campaigns help to position a non-conventional learning institution in the educational landscape and to foster social acceptance and recognition. Prospective students of the virtual education system anywhere in the world are likely to ask themselves the same questions: Is it possible to learn through tele-teaching? Are these degrees as valid as the 'other ones'? If I study at a virtual university, will I have the same opportunities when looking for a job as I would if I were to study at a conventional university? Doing away with all these doubts calls for a great effort by any university offering virtual programmes, which is not the case for face-to-face educational programmes since no such explanations are needed. As UNQ President Villar has often pointed out, paraphrasing a Canadian colleague:

> the university is one of the most conservative institutions, so much so that if an eleventh-century professor came back to life in the middle of a conventional classroom he would feel at home, whereas if a physician of that same century were to appear in an operating room where a heart transplant was being performed, he would die from a heart attack.

With poor development of the higher education market in Argentina – due to the fact that 85 per cent of the university students attend public, free-of-charge universities – the UVQ operates in a context of underdeveloped student financing, which is totally different from the experiences in countries where university education is not free of charge. In those cases, banks and other financial organizations think of university students as clients. It is obvious that UVQ students analyse and compare the cost of studying in a virtual environment that is

not free of charge with attending an on-campus classroom that is free of charge but has external costs such as transportation, boarding and books. The absence of long-term financing with a grace period while the student is at university and of repayment of debt once the student has graduated, makes access to virtual education difficult for a greater number of students in Argentina.

If one of the aims of a virtual university programme is to become financially self-sufficient over a given period of time, some kind of financing will have to be made available to students; without this possibility, the tuition that the programme can realistically charge will be too low for achieving financial balance. The UVQ's average tuition fee is US$140 per month, which means that for a thirty-month Bachelor's degree the total cost would be US$4,200, which is very low. The absence of credit financing systems discourages prospective students who, at the outset of their studies, cannot even pay US$140 per month. However, these students would undoubtedly be willing to pay up to US$200 a month if they could pay half of this amount during their studies and repay the other half once they were working as professionals.

To sum up, the underdevelopment of the banking system in countries with low per capita income severely limits strategies of self-financing for virtual university programmes.

As for the technological infrastructure, the UVQ experience has shown that the development of front-end Campus Virtual systems is recommended to make navigability easier, with more intuitive and friendlier interfaces. These may include multimedia resources (hypertext, sound, video) to provide better support and more flexibility for virtual education models. Moreover, well-developed front-end systems are needed to be able to accept virtual multi-campus classes and classrooms, where each may have its own institutional image; enhance the visual image; include evaluations and self-evaluations that form part of the virtual classroom; go beyond e-mail as the only means of communication; and work with many browsers, multi-platforms and multiple databases.

Finally, academically speaking, the challenge is to do research on – and apply pedagogical models to – distance education systems based on the new ICT. As Santangelo (2000) wisely points out:

> We should think about pedagogical models because very frequently the impact and great advances of ICT make us believe that they are the main factor; cancelling or leaving aside the basic principles of education, reducing them to a superficial and intuitive version.

Thus, we must be coherent with regard to our teaching-learning, constructive, psycho-pedagogical approach, avoiding the exclusive aim of maximizing the number of users or minimizing educational costs. The challenge is to improve the processes of interaction and construction of knowledge shared among and between teachers and students.

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