
ECOMPETENCE AT THE UNIVERSITAT AUTÒNOMA DE BARCELONA (UAB): A CONTEXT ANALYSIS

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Introduction

In order to react to the challenges of constant technological change and its influence on all spheres of activity at the university (management, research, teaching and documentation), the Universitat Autònoma de Barcelona (UAB) has created various information and communication technology (ICT) facilities. In this paper we describe the UAB within the context of Spanish universities, indicate technological development in the university and provide some reflections on the extent to which ICT services foster institutional and individual eCompetence.

1. The Autonomy of Spanish Universities

With the turning of the century and the relentless consolidation of the information society, the University faces a new socio-cultural scenario which is based on a global economy and is extremely sensitive to innovation and demands arising from rapid and continuous technological change.

Spanish universities have developed considerably since the – now repealed – University Reform Act (LRU) was passed in 1983. This was enacted due to a need to adapt and address the emerging context of technical and scientific development. This was a period which had seen a long process of social transformation and it was necessary to adapt the university environment to the more advanced models in Europe in order to satisfy the demand for high-level studies to provide qualifications for a generation who would have to take the helm at this historic moment. The LRU fulfilled its mission of democratising the universities and at the end of 2001 it was substituted by the Universities Act (Ley Orgánica de Universidades). This established the following functions of the university system:

1. Universities undertake the *public service* of higher education by means of research, teaching and study.
2. The following are University functions serving society:
 - a. The creation, development, transmission and critical examination of science, technique and culture.
 - b. Training for professional practice which implies the application of scientific knowledge and methods and for artistic creation.
 - c. The development of science and technology, as well as the diffusion, evaluation and transfer of knowledge for the service of culture, quality of life and economic development.
 - d. The diffusion of knowledge and culture by means of extra-mural activities and life-long learning.

The Act sets out that Spanish Universities are individual legal entities and develop their activities autonomously, but in coordination with one another, without prejudice to the competences reserved for the central government and the governments of the autonomous communities (see table 1).

Competences reserved for the central government	Competences reserved for the governments of the autonomous communities
<ul style="list-style-type: none"> • General administrative and educational planning • Advice and coordination for autonomous entities • General regulations on entrance systems • General directives on curriculum • Regulations on general processes for the selection of teaching staff • Granting of official qualifications and accreditation for regulated studies • Management of research programs 	<ul style="list-style-type: none"> • Global financial administration and free use of funding received • General coordination of universities • Management of the selection and entrance processes • Control of results • Management of research programs • Distribution of qualifications to be given by Universities • Control over the quality of the university system

Table 1: List of competences related to the university system

As we can see, the Spanish universities have, little by little, increased the scope of their competences taking on at present the following responsibilities:

- Administration and control of organisational systems
- Management of the process of teaching staff selection
- Organisation and allocation of the annual budget
- Administration of their own studies
- Approval of by-laws and the election of governing bodies
- Process autonomy
- Internal organisation and management

2. The UAB in the Context of Spanish Universities

It is not easy to summarise the story of the past and the present of a University, even in the case of an institution as young as the Universitat Autònoma de Barcelona (UAB). Nevertheless, it is important for context setting. In 1968, the year of the *Prague Spring* and *French May*, three new universities were created in Spain (one of which was the UAB), the first since the Civil War, as alternatives to those already existing. It was the beginning of a reform that aimed at modernising teaching in order to adapt to development needs and international trends. An institution was established that could be considered at international standing, due to the range of programmes it offered, its links with society, its emphasis on research, but, above all, because of its liberal character and the quality of its teaching staff. The model that was adopted was that of the complete university, the Campus model which successive Vice-Chancellors have attempted to nurture as far as possible.

Its first years coincided with the last years of the Franco dictatorship and the transition to democracy, which meant that it faced many hurdles during its consolidation, both of a financial nature, given the

meagre resources that government allocated to the universities, and of a political nature, given its aim to contribute to the democratic recovery of the country.

In spite of its modest beginnings, the UAB is now able to carry out these functions given an infrastructure that comprises:¹

1. Eleven faculties, a higher school of Engineering, two schools of its own and fourteen schools associated or linked to the University.²
2. A community of over 50,000 people, made up of:
 - a. more than 45,000 students, including postgraduate and Erasmus students
 - b. almost 3,000 teachers and researchers
 - c. nearly 2,000 administrative and service staff.
3. A budget of over €232 million

3. Technological Development at the UAB

The history of technological development in the UAB is similar to that of most of its neighbouring universities. Over 10 years ago a number of parallel projects were set up to foster ICT in the university. For example, the *Oficina Autònoma Interactiva Docente* (OAID) was set up in 1996 with the aim of fostering the use of ICT in teaching, especially the use of the Internet and its possibilities (*Campus Virtual*). The computerisation of administrative and academic management processes was undertaken progressively (self-enrolment, academic files, lists of students, teaching activities of staff, etc.), research management (computerised procedures to apply for grants, access to scientific output), communication and information management (computer services, servers, computer science rooms, Internet access, institutional email, etc.) and digital documentation management (UAB catalogue, Decomate, summaries of electronic journals, digital books etc.). Such progress has led to collaborative projects and ventures with local and international companies, universities³ and other organisations.

Today, the emphasis is on improving quality, effectiveness and the range of services, recognising the importance of coordinated action, increased resources and strategic planning for research, teaching and management.

Historically, there had been no explicit reference to *eCompetence* but a recent resolution of the Governing Board⁴ identified specific objectives relating to ICT processes, the development of an institutional model, clarification of the structure of support services and identification of computing infrastructure and support needs. Currently, in response to this and calls from the *Vice-Rectorate for Doctoral Studies and Continuing Training*, a proposal for a psycho-pedagogic eLearning model for postgraduate studies is under construction. The model takes on the philosophy of the *European Space for Higher Education* which puts the student at the centre of the teaching-learning process and offers reflections and psychological and pedagogic proposals for the design and optimisation of a range of ICT based teaching scenarios (including blended learning on campus and distance learning)

¹ Data from June 2005

² Subject areas: Social sciences, Humanities, Health Sciences, Experimental and Technological subjects

³ e.g. *Inter-campus* which comprises 8 universities and around 200,000 students in Catalonia

⁴ 8th November 2005

3.1 Studies on ICT in Spanish Universities

It is only recently that research on higher education policy and practice has been undertaken to any great extent in Spain, partly as a result of historical reasons in the development of universities, which meant that there was no tradition of external comparative studies, for example. The new legislative framework, which was highly controversial at its inception (LOU, 2001) did begin the first steps towards accreditation and European convergence.

We present here a brief summary of some of the recent research studies.

Research carried out by the CCUC⁵ team (UAB) on institutional culture (CCUC, 2003)

Since 1999 a research group sponsored by the Spanish Ministry of Education and Culture has developed research to study culture change in four Catalan universities. This study used interviews, questionnaires and document analysis, obtaining feedback from over 200 university teachers, 100 students and a subset of administrative and service staff. The *Questionnaire for the Study of University Organisational Culture* covered 10 aspects, one of which was the impact of ICT on the university (spanning ICT and administration, ICT in teaching and research, and infrastructure issues) and an example is shown in table 2.

What is the current situation				How should it be?				
1	2	3	4	9. ICT (Information and Communication Technology)				
1	2	3	4	1	2	3	4	
				9.1 In administrative management tasks in the university, the functionality (filing and data base management, calculation and publishing, source of information, means of communication...) offered by ICT (computers, networks, multimedia) is taken advantage of appropriately.				
				9.2 ICT enables students to communicate with other members of the university community, facilitates administrative procedures (enrolment, consulting grades, requesting documents...) and access to various services (bibliographies and databases).				
				9.3 ICT provides administrative and service staff with new tools to carry out their tasks: managing room material bookings, internal communication, administration and secretarial management				
				9.4 ICT enables teachers to communicate with other members of the university community, facilitates administrative procedures: (entering grades, requesting document) and access to various services (bibliographies and databases).				
				9.5 In teaching and research activities, teachers use ICT and foster its use by their students.				
				9.6 Teaching staff use ICT in tutorial activities.				
				9.7 ICT is used as a support for teaching (virtual subjects, virtual classrooms).				

⁵ CCUC Research group (Canvi de Cultura a la Universitat Catalana): <http://dewey.uab.es/mtomas>

				9.8 Future professional applications of ICT are present in subject programmes.				
				9.9 Computer science rooms available to teachers and the existing computers and Internet access are adequate.				
				9.10 The computers and Internet access available to teachers (offices, research centres) are sufficient (for professional use).				
				9.11 The computers and Internet access available to administrative and service staff are sufficient for professional use.				
				9.12 The computers and Internet access available to students are sufficient (to undertake work outside the classroom).				
				9.13 The ICT infrastructure of the library is adequate.				
				9.14 The ICT infrastructure of classrooms (computer, monitor, projector, Internet access video) are sufficient				

Table 2: Items of the ICT Dimension on the Questionnaire on Culture Change in Catalan Universities

The main conclusions regarding ICT were that:

- a. There was a lack of *appropriate* infrastructure in so far as there was a need for greater communication between groups, improvements in administrative systems to facilitate various aspects of management.
- b. There should be increased use of ICT in teaching and learning, with a clear emphasis on training, but without conflating this with distance learning, recognising that the universities are based largely on face-to-face courses.
- c. Staff judged that there was moderate use of ICT in classes but it is focused more commonly on information management. They are supportive of an increased use of the technology in teaching tasks.

Study by the CRUE on ITC in the Spanish university system (CRUE, 2004)

The Spanish University Vice-Chancellors' Conference (CRUE) requested a diagnostic report on the use and generalised presence of ICT in Spanish universities, which was undertaken by a group of teachers from the University of Santiago de Compostela. This research was published in 2004 and was one of the first general snapshots that gave a picture of the real situation of ICT in answer to the question "What is the situation of the Spanish university system?"

Questionnaires aimed at ascertaining the national picture at a general level (i.e. for the Spanish system as a whole) were collected from 71 centres (48 state and 23 private), of which data was contrasted from 32.

The results provide a fascinating and detailed breakdown of expenditure, resource allocation, issues and problems faced along with identifying staff needs. It is clear that very few institutions provide training courses for teachers and administrative staff in ICT use and little is invested overall in this aspect, despite substantial investment in the infrastructure. There are still deficits in availability of resources in terms of international comparisons and in terms of the lack of ICT issues in institutional strategic planning, something which is an urgent issue for quality improvement.

The study on ICT potential in Spanish universities

In March 2004 the University of Oviedo (Department of Applied Economics) published a study carried out on the impact of ICT in Spanish universities which explored ICT profiles, online management and information and the structure of the “virtual campus.” The evidence base, or indicators used, included the level of qualifications in ICT, the virtual academic office and processes of eLearning. A classification scheme was proposed and it is interesting to note that UAB was considered the most developed in terms of ICT use, particularly with regard to eLearning structures and the virtual campus.

The general conclusions of the study point out that:

1. there should be more study and analysis of ICT penetration in the university given that this diagnosis is essential if we want to draw up improved action plans;
2. these studies should be carried out transversally in order to analyse various developments in the system and to undertake a specific follow up of each university;
3. finally it was proposed to include more indicators to widen the scope and depth of the study.

Whilst UAB has recognised these studies as being strategically well placed, there are three areas for improvement: the general level of qualifications in ICT, the systematisation of data related to new technologies and the generalisation of the use of the *virtual campus* and blended learning approaches. It also identifies, very evidently, a lack of systematic, strategic planning of the various actions linked to ICT.

4. Individual and institutional eCompetence: An implicit model of analysis

Analysing the eCompetence of an individual or a university institution requires prior consensus on what we understand by the terms *individual* and *institutional eCompetence* and an identification of the main features present in each of these definitions. Firstly, university eCompetence can be defined as the set of organisational solutions, using ICT design, application and innovation, which enable institutional organisational development. We consider that university development means constant adaptation and review of functions (teaching, research and the transfer of knowledge in the service of culture, quality of life and economic development) and hence eCompetence should be reflected in all of these.

We also have to consider that institutional competence in the use and exploitation of technology is *not just the sum of individual competences*. Institutional competences must be based on the knowledge, technology and “know-how” of the many teams that make up the organisation. Therefore the university, through its governing bodies, has to be able to identify what its needs and priorities are, and implement them in the organisational structure, evaluating their impact at a later date. Lastly, this has to be seen as an ongoing process if we want to continue being competent.

On the other hand, personal eCompetence is the potential that an individual (teaching, non-teaching or student) has to find solutions for issues arising in their daily tasks, incorporating the appropriate and coherent use of ICT when relevant. This implies knowledge of the functions of the technology, knowing how to apply it and how to explain it. Development of individual competence will be facilitated by the development of learning processes with feedback from others and one’s own experience and reflection on practice, whilst also incorporating the technological thinking of the institution.

If we go down one level and specify a definition for each of these groups, we can say that:

- Teachers' individual eCompetence can be defined as the capacity to choose at any given teaching/research moment the tool which is both most appropriate and coherent with the objectives of the university/faculty/department and the expectations/needs of the students and society. This implies skills, aptitudes and attitudes in a critical, effective, practical, reflexive and contextualised selection of the technology and learning, teaching and researching media.
- Students' individual eCompetence can be defined as the capacity to carry out the tasks of self-enrolment, consulting grades and other administrative tasks; follow the explanations and proposals for activities, work and other requirements that arise in a particular subject without this being a hurdle to obtaining the results expected.
- Individual eCompetence on the part of non-teaching staff can be defined as the capacity to address the tasks they are charged with. These competences will vary depending on the task each individual has to carry out. If it is a case of teaching support they should be acquainted with the tools most commonly used in teaching, if it is a case of research support, they should know the technology and research tools of the specific scientific field where they are providing the service, etc.

Hence, taking what was said previously as a reference, that is that institutional competences must be based on the knowledge, technology and know-how of the many teams that make up the organisation, we have prepared the following table which will help us to visualise the complexity of the term. We consider that institutional eCompetence will be associated with the following analytical elements or criteria (table 3):

Areas / Criteria	Teaching	Research	Management
Infrastructure	Software, hardware (videoconferencing facilities, projectors and computers per classrooms, etc), platforms (virtual campus, etc.), intranets, Internet	Software, hardware platforms (virtual campus, etc.), intranets, Internet	Software, hardware platforms (virtual campus, etc.), intranets, Internet
Use	Teaching material, didactic and multimedia resources	Specific research software	Academic management
Training	Specific teachers workshops and seminars, in-service programmes for new teachers, mentoring	Specific research workshops and seminars	Workshops, specific workshops and seminars for managers and administrators
Development	Teaching innovation, a more complete and efficient use of platforms or didactic resources	Grants and assistance for the researchers' development, use of appropriate research software, etc.	Evaluation of services, recurrent questions, use of intranets, etc.
Institutional policies and strategies (Statutes, strategic plans, incentives...)	Incentives for quality teaching, programmes for innovation	Proposals for the evaluation of research, doctoral programmes	New structures, academic procedures

Table 3: Areas and criteria for the presence of ICT in an e-competent institution

In the table we can see three columns corresponding to the three main functions of a University: teaching, research and management, in which teachers, students, administrative and service staff are involved. The rows indicate the criteria used to analyse ICT. The following criteria are used:

- Infrastructure (from the point of view of its existence, sufficiency and quality, etc.);
- The use made of ICT (frequency, type, function, quality, etc);
- Training given in ICT (seminars, courses, content, type, etc);
- Development, implied at an individual and institutional level (type of innovation, type of grants, sophistication in the use of programming, type of questions put forward, degree of complexity of the procedures that are carried out, etc.);
- The presence of ICT in the various documents that refer to policies, plans or strategies.

Therefore, we can say that a university is e-competent when, in each of these areas, and for each of these criteria, ICT is present and its presence is dynamic, meaning that it is reviewed regularly.

5. UAB and the development of individual and institutional eCompetence

In order to respond to the challenges of constant technological change and its influence on the many different spheres of activity at the university, the UAB has created various services and facilities. We will now consider, in turn, ICT use in management, research and teaching.

5.1 *eCompetence Development in Management:*

Table 4 sets out and explains the main indicators for the UAB in terms of management.

Area / Criteria	Management
Infrastructure	Oficina Autònoma Interactiva Docent (OAID), Servei Informàtica (SI)
Use	SIDEC, FENIX, Research Web, Students' Web
Training	Sigm@, OAID ⁶
Development	Self-enrolment, academic records online, access to scientific production, virtual academic office
Institutional policies and strategies	<ul style="list-style-type: none"> • Provision of an external audit of the global process of ICT services in the UAB (management model, existing equipment, equipment and infrastructure plan) • Definition of the structure of computer support services (central and faculty IS) • Promotion of the digital library

Table 4: ICT presence in UAB management

The UAB provides email services and Internet access, both on campus and from students' and teachers' homes, as well as enabling the carrying out of administrative procedures (formalising enrolment, consulting academic records, requesting certificates, etc.) online.

OAID is the UAB office in charge of coordinating, promoting and developing ICT tools and applications for teaching in the university community. It aims at:

- Promoting the use of ICT in teaching and learning processes
- Developing educational platforms according to curricular or educational needs
- Organising teacher training programmes related to using ICT

⁶ <http://www.oaid.uab.es>

- Collaborating in the creation of multimedia material projects
- Developing the bimodal teaching system at the UAB by helping teachers develop distance or non-distance teaching projects.

Specific tools listed in the table are:

- SIDEC – financial software handling grants, purchasing, etc.
- Sigm@ - registration and credit accumulation/qualifications database
- FENIX⁷ - access to research output, publications, dissertations, etc.
- Research Web – information for researchers covering grants, international programmes, etc
- Student Web – email, self-assessment, notice boards, newsletters, library, etc.

In addition, UAB promotes equipment leasing and invests in computer installations. Of course, while this has brought about significant change over the last 5 years at a conceptual as well as practical level, the picture is complex and there have been difficulties, technical problems, etc, but there is a culture emerging of continual change and the importance of reflection and evaluation on such development is clear.

5.2 *eCompetence Development in Teaching:*

Areas / Criteria	Teaching
Infrastructure	OAID, Postgraduate School
Use	OAID (Campus Virtual), Masters and PhD
Training	IDES (training in general), PETIC (specific training in ICT)
Development	Subject Portal (OAID)
Institutional policies and strategies	<ul style="list-style-type: none"> • Intracampus virtual courses to favour interdisciplinary studies • Intercampus virtual courses (Metacampus, Intercampus and Campus Global) • Promotion of teaching innovation projects related to eCompetence • Different levels of blended-learning studies as pilot experiences

Table 5: Presence of ICT in teaching at the UAB

In 1996 the Oficina Autònoma Interactiva Docente (OAID)⁸ developed a blended-learning model with the objective of complementing traditional attendance-based learning with the possibilities offered by new technologies in order to promote teaching innovation and improve communication between teachers and students.

*Campus Virtual*⁹ is the tool that makes this possible. This virtual platform is used both as a support for attendance-based courses and for distance learning. The virtual campus has two different profiles, one for students and another for teachers, each containing a different set of functions. Over the past four years it has developed to address both the teaching needs put forward by staff and the increase in the number of users, teachers and students. Among the new functions which have been introduced are: the ability to publish material of all types, including web pages; a private area for teachers, not accessible to students; gradual release of content to develop students' virtual portfolios; support for autonomous learning and self-evaluation.

⁷ www.recerca.uab.es

⁸ <http://www.oaid.uab.es>

⁹ www.cv.uab.es or <https://www.interactiva.uab.es/cv>

During Academic Year 2004/2005, some 2500 courses/groups from 16 different schools (35% of the total number of courses on offer) have registered on Campus Virtual (involving approximately 1,300 teachers and 20,000 students). Its growth is as shown in figure 1, along with an example screenshot. Training sessions are provided at both university and faculty level and OAID also coordinates a number of other projects in collaboration with other universities (Campus Global, Metacampus and Intercampus)¹⁰, all of which have registered continual growth in uptake over the last few years.

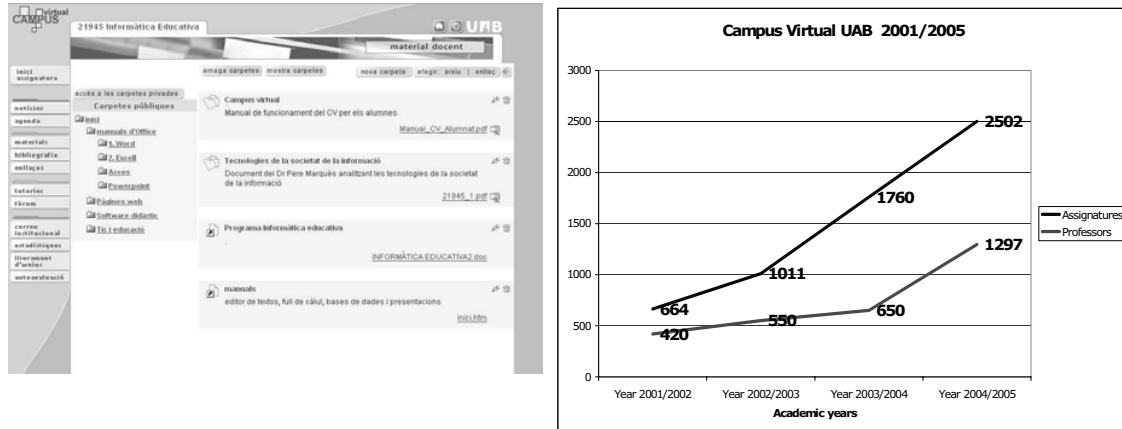


Figure 1: Campus Virtual and its growth

5.3 Teacher training and Teaching Innovation Programmes

The unit of Innovation in Higher Education Teaching (IDES)¹¹ is the UAB's division responsible for organising, developing and assessing teacher training, as well as promoting teaching innovation within the university. Its particular objectives are to ensure that degree programmes are adapted to conform to the principles of the *European Higher Education Space* and to support a number of teaching and learning projects which promote quality, innovations and effectiveness.

According to Rué (2004), any learning proposal consists of a particular proportion of three main axes; level of depth, type of relationship with phenomena and degree of external support, as we can see in Figure 2:

- Learning is in stages, from information acquired to being able to evaluate, according to, for example, Bloom's scale;
- Learning also takes place through direct and indirect experience or in a particular combination of the two; and
- Learning is a relationship between dependency on another, their support, be it local or distant, and learning can be autonomous.

¹⁰ https://cv1.uab.es/cv/info/index.jsp?plana=e_compartits.htm

¹¹ www.uab.es/ides

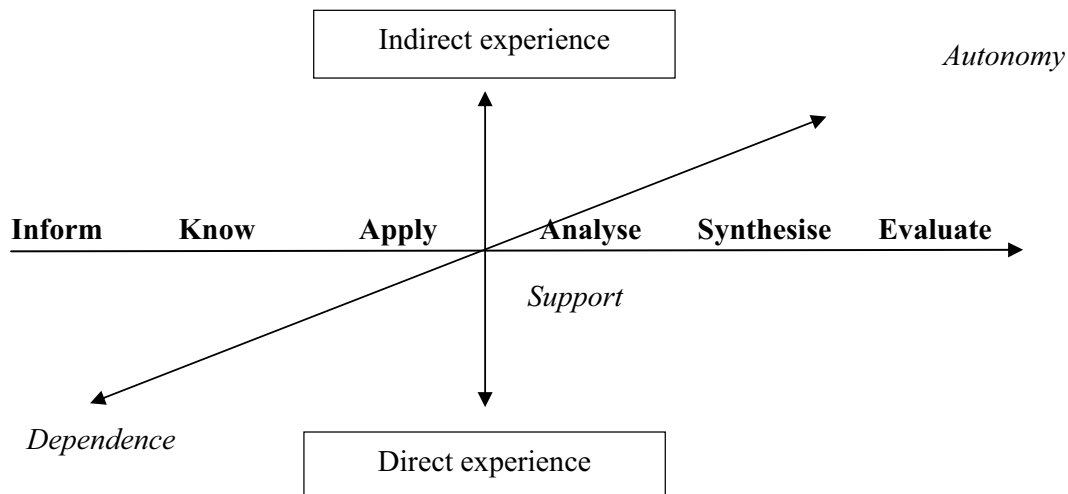


Figure 2: Variables that affect learning as a whole (Rué, 2004)

In practice, these ideas are developed through the provision of various types of training and resources as summarised below.

FDES(Formació en Docència a l'Educació Superior)	Development of teaching competences including planning, strategies, etc
Workshops and training seminars	Teaching strategies, evaluation, eCompetence
Talks and conferences	Innovation
Virtual Library Project for Learning (BREVIÀ)	Portals for each degree, classification and access systems, integrates conceptual, organisational and functional aspects within an eCompetence framework
Virtual Resource Library for Self-assessment	Promotion of independent learning and social learning in groups, designed from student's perspective, active engagement.
PETIC (Pla d'Extensió de les Tecnologies de la Informació i les Comunicacions) ¹²	ICT software training for academic staff

Table 6: Courses and resources from IDES

5.4 Teaching innovation projects related to eCompetence

The UAB places special emphasis on promoting the creation of teaching and research innovation. At present there are more than 30 working projects distributed in the 5 UAB fields of knowledge: Experimental Sciences, Social Sciences, Engineering, Human Sciences and Health Sciences. Some of these promote and develop eCompetence among their members. These projects receive funding from the Department of Universities of the Catalan Government.

Included amongst these are projects to develop new learning materials and learning methods, such as, the use of Problem-Based Learning in Chemistry, or the sharing of resources through websites such as in Latin and Literature, Geography, Psychology and Mathematics. These include images, data and animations to help elucidate complex concepts. Other project focus on: the facilitation of the use of ECTS (European Credit Transfer System); interactive tool design for virtual learning (such as in Geology, Communication and Advertising, Veterinary Studies and Medicine and Translation studies);

¹² <http://lamp.uab.es/petic/>

the reduction of “drop-out rates” using self-assessment, diagnostic tools (Pharmacology, Engineering, etc); strengthen the link between theory and practice (Veterinary Studies, Journalism, Social Psychology).

Each faculty now has a computer support service with computer labs and other equipment as well as information regarding installation, maintenance and repairs.

5.5 eCompetence Development in Research

Table 7 presents the various services offered for *generic research support*. Of course, we cannot provide details of every individual resource for specific subject areas.

The development of technological competences in research are promoted in part by the training provided by each department or research group, or in the specific research consortia themselves located on campus at the UAB. Aimed at the university community in general, and within the framework of technological development in research, there is also the Statistics Service which offers advice and training to teachers on software (basically software designed for quantitative research) and carries out, at the request of users, statistical data treatment.

Areas / Criteria	Research
Infrastructure	Àrea d’Investigació i Desenvolupament, Servei d’Estadística, Digital Library
Use	FENIX, Digital Library, specific statistical programmes (SSPS, AQUAD, NUDIST, Hyperresearch, etc.)
Training	Statistics service, library service, and each research group, centre, consortiums or knowledge area
Development	Statistical skills for the university community; access and provision of aid, grants; interdisciplinary and interuniversity research; consulting databases
Institutional policies and strategies (Statutes, strategic plans, incentives...)	<ul style="list-style-type: none"> • Validation of the UAB research map and preparation of a strategic research plan; • Improvement of research structures to foster transversal and interdisciplinary action; • Reinforcement of the communication of research results and the establishment of active measures to promote research; • There is no mention of improving researchers’ technological competences, but it does mention the development of specific action more focused on the needs of each unit and the consolidation of research quality groups;

Table 7: ICT presence in research at the UAB

The *Research and Technology Area* linked to the Vice-rectorate of Research, informs, resolves (in the context of the UAB) and manages financial aid, grants, teaching and research exchanges. Apart from this, it controls the FENIX application (explained above) which is a tool designed to facilitate data management on researchers at the UAB, and which enables their CV’s to be kept up-to-date and to retrieve them in the various formats defined by official organisations. From the information contained in FENIX statistics about the scientific activity of a particular group or department are prepared and it also provides access to the final Research Report.

Libraries are “*cathedrals of knowledge*”, subject to considerable change due to the impact of ICT in relation to everything concerned with knowledge: acquisition, process, classification, cataloguing, etc. The Digital Library, with six years of history, is an important element of the UAB Libraries through which electronic journals are accessed along with the Digital Library of Catalonia (BDC), which is a compendium of electronic information (e-journals, e-books and database) jointly subscribed to by the

member institutions of the CBUC (Consortium of University Libraries in Catalonia) and therefore sponsored by the Department of Universities, Research and Information Society of the Catalan Government. These resources are available from any point of the network by means of IP address control. Part of the contents held within the BDC, which belong to the Catalan databases, are openly accessible to everyone. Presently (January 2005), its collection consists of 6,800 e-journals, 3,650 e-books, 34 subscribed databases and 20 Catalan databases.

Both students and teachers regard the Virtual Library as very useful. There is an increasing demand for and use of this digital service, and thus the growing acceptance of the digital library and its incorporation into academic activities imply that classical libraries are being used less. Some of the indicators of this phenomenon are:

- fewer users consulting traditional libraries
- reduced demand for documents in traditional formats
- rethinking of the document classification systems
- review of the material acquisition budget
- application and renewal of document loans through the Internet
- books and journals acquired through online by teaching and non-teaching staff (Hipatia virtual).

Training in Library services and skills is undertaken by staff in each faculty and is continuously available. The UAB Libraries are recognised as one of the best services of the university. At present, the entire network of UAB Libraries has been awarded the quality accreditation of ISO 9001-2000 and has obtained the Quality certification of the Ministry of Education and Sciences (Directorate General of Universities).

6. Conclusions

In this section we will point out some general conclusions on eCompetence in universities and other conclusions related to eCompetence at the UAB in particular.

6.1 At a general level

Decisions taken by universities on the transfer of knowledge and technology are fundamental for technological development. These proposals should be within the framework of institutional strategies that specify which policies should be followed and should serve to give coherence to the multitude of different types of action on technological developments which are carried out by units, departments or other areas.

Such proposals/strategy should, as a minimum, refer to:

- ICT training for university staff should address teaching, research and management needs, covering both generic and the specific needs of particular groups.
- Incentives for staff should be effective enough to counter resistance on the part of teachers and other staff to engage in ICT professional development.
- The general proposals and strategies of universities and each operative unit should be engaged in such development.

- Flexibility in anticipation, vision of the future, proactiveness and sustainability over time should be characteristics of these proposals. They should be valid, exceed the terms imposed by the various governing bodies and have an extended life.

6.2 At the level of the UAB

For several years the UAB has fostered a policy based on endorsing and developing ICT practices and processes in the university. This experience has permitted a balance among the projects undertaken that affect the various areas of development of university life such as teaching, research, management and documentation, although some are more reinforced than others.

All the features described above enable our university, which is an attendance based (i.e., non-distance) institution, to be able to begin addressing the multiple challenges arising from this new form of blended-learning. The varied experiences we have had and our analysis demonstrate that the university model of the 21st century does not correspond to that of a purely attendance or a purely distance university, but one that will have to use the possibilities of ICT to answer society's demands and to train the community in a more appropriate and responsive manner.

The UAB has established partial policies for ICT development which means that the level of development in technological competence varies from faculty to faculty, or centre to centre. These differences exist:

1. with regard to human resources (teaching support in the development of individual eCompetence; in some there are support interns for research, for the development of web pages, for the creation of interdepartmental courses for teaching innovation, who advise and support teachers in this type of teaching development, etc.),
2. with regard to infrastructure (while some faculties have computers and monitors in all rooms others are less well equipped),
3. as regards the incorporation of ICT in management. For example, the students' academic management programme which enables them to see their grades, subjects and even enrol from any place has been implemented very slowly.

This difference in pace and initiatives is the result of interesting but not sufficiently integrated partial policies. It should be pointed out that a global policy with the aforementioned characteristics has been initiated very recently with a Strategic Plan that aims to achieve these objectives (Governing Board, 8 November 2005).

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