

Campus Global

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Universitat Pompeu Fabra¹ (UPF) is a public university founded in 1990 by the government of Catalonia, Spain. It is located in the historic quarter of the seaside city of Barcelona.

UPF offers 21 degrees and 12 doctoral programs in the humanities, social sciences, biology, information technology, and communications. The university currently has 9,000 students and 615 faculty members (FTE), as well as 560 administrative and service personnel.

One of the main ideas behind the university was to create an outstanding educational institution that would be renowned for its excellent standards in teaching and research as well as for high-quality management. Hence, from early on, the university adapted to predicted future demands, progressively introducing innovative tools and promoting the use of information and communication technologies.

The university environment's world of knowledge is constantly changing. For this reason, the UPF board of trustees decided in 1998 to integrate existing and future interfaces into a common information and communication network that would serve all members of the university community. Campus Global came into being—a single portal that would launch the university into the knowledge society of the twenty-first century.

The Campus Global portal was not envisioned as just a technological platform. More importantly, it represented a commitment on the part of management to making the university run in a specific way. It was a tool that would streamline administrative services and

The Campus Global project provided a campus-wide portal while changing the way the Universitat Pompeu Fabra operates

procedures, and would also integrate innovative tools to improve instruction and learning and promote university research.

Implementation of the Campus Global project began in 1998. The project aimed to change the ways in which the university community worked, taught, and learned. This was by no means an easy task. The project had to act as a springboard for change, but at the same time the university board of trustees wanted to limit the traumatic effects on the organization.

This article will explain how the Campus Global project was carried out, the transformations it instigated inside the organization, the improvements it has brought about, and our current stage in the project.

Getting Started

The Campus Global project did not pop up out of nowhere. In 1998, UPF already offered state-of-the-art information technology and academic services in Spain. Despite being a relatively new institution, it has always appeared at the top of Spanish university rankings.

The idea for the project came into being when we realized that it was just not enough to have a good university Web site or to offer a lot of online administrative services. We felt that we had to address the need for a single portal that would provide a one-stop shop for the entire university community.

The university already provided a number of information electronic services that were fully operative at the time: a university Web site as well as center, department, and service Web

sites. Professors were starting to upload educational content to different university servers. The university had also implemented the ARIADNA² project, which consisted of a series of interactive electronic kiosks located in university lobbies that provided information to students, as well as electronic billboards—panels located in public places such as the lobbies that displayed announcements of university activities. UPF possessed a wide array of different systems that would become more difficult to manage and monitor as the need for growth increased.

The Campus Global portal would have to channel all these initiatives into one system. The project did not involve only technological changes, however. It also required a change in mentality and in ways of doing things. Its ultimate objective was to bolster the organization's digital culture in a social environment where this did not seem such an obvious need. In 1998, Internet use was not widespread among the Spanish population, and even today Spain still has one of the lowest Internet user rates in Europe, approximately half of what it is in the United States.

Seen within this context, the decision to provide e-mail service to all members of the UPF community and the substantial investment effort aimed at providing public access to computers for students on the university campus were critical, pioneering steps. They were nevertheless absolutely essential if we were to implement a far-reaching project such as Campus Global.

Organizational Changes

The leap the UPF board of trustees wanted the university to make was such

that it demanded certain organizational changes before the project could successfully begin. Though all the technological aspects of the project were the responsibility of the Computer Services Department, changes were made to properly address the various functional aspects of the project on many fronts.

A new post was set up for this purpose, that of Delegate on matters of technological and educational innovation, who reported directly to the president of the university. The Delegate was responsible for launching the project and making sure that it remained consistent with the university's innovation policy and educational standards. Furthermore, three new posts were created in the Computer Services Department to help set up the Campus Global platform. These steps took place at the start of the 1998–1999 academic year.

A little later, following an initial pilot study, the university introduced administrative changes using existing resources. A new Information Systems vice-manager was appointed, and a new administrative service was established, USICE (Unidad del Sistema de Información y Comunicación Electrónica, or Web Services and Information Architecture Unit). This new unit was in charge of coordinating the functional aspects of the Campus Global project: analyzing and detecting new needs, plus all aspects of portal organization such as information architecture, navigation, layout, and design. USICE was also responsible for extending use of the portal throughout the university community. This unit would act as a go-between linking the Computer Services Department, which was responsible for developing the platform, with its final users.

Developing the Project

The development of the Campus Global project began simultaneously on various fronts. The most urgent issue to address was that of defining the project. The university had to decide what type of single gateway it wanted and what information system would support the platform.

Defining the Campus Global Portal

The chance to set up a single portal (a one-stop shop) that would provide integrated information and Web site services to the entire university community was a real challenge. Many options were open to us, and we had to choose one of them.

The first decision was implicit to the project concept: We had to coordinate all the information and communication systems already existing in the university and make them accessible through a single gateway, the Campus Global portal, which would then become the sole university intranet. The system would also encompass the institutional Web site, the contents of which would be part of the same system, but that would serve off-campus users.

The portal would have to meet the following requirements:

- Different levels of access for all the members of the university community
- User authentication by means of a personal login and password that could be obtained automatically on the university Web site
- Content presentation directed at different user profiles—students, graduates, professors, administrative staff, as well as customized contents

The portal would therefore be customized. One of the most important technological aspects of the platform was that it had to integrate different applications into a single gateway. This meant that users could access all portal services with a single cross-platform login.

As far as e-mail is concerned, we decided that during the first stage we would only integrate the students' e-mail system (this service was to be pro-

The university had to decide what type of single gateway it wanted and what information system would support the platform

vided by an outside company). The e-mail system used by professors and administrative and service staff is not scheduled to be incorporated until the end of 2003, by which time the university will have installed the new system acquired for these collectives.

The Global Campus platform was built entirely in Java and based on a three-tier architecture: presentation (Web servers), business logic (application servers), and data. It currently runs on the IAS-6.5 (Internet Application Server), which provides scalability, high availability, high performance, and easy integration with other systems. Oracle is the main database server, but the application guarantees access to and interaction with all the organization's databases on different platforms—LDAP directories and other databases such as Ingres, for example.

Developing Online Services

The single gateway needed to provide online and customized services to all members of the university community. It had to replicate all the services the university offered on a person-to-person basis and offer them online. The aim here was not only to make people's lives easier but also to prepare them for the information society of the twenty-first century.

The first issue we had to address—a basic service of the university—was establishing an e-learning environment that would complement classroom instruction. We opted to create another platform within Campus Global, which we called Aula Global (Global Classroom), to integrate all the learning content in the university academic databases. Closely related to this initiative was the decision to provide free e-mail addresses and Internet access to all

students. (In 1998 this decision did not seem as obvious as it does today.)

Another objective was to enable students to carry out all academic and administrative paper-based procedures through the portal: enroll, consult their academic record, ask for a group change, or skip one exam date in favor of another. Academic and administrative personnel would also be able to access the portal to consult their payroll entries or the account statements of their research projects, request leave, and so forth. All these functions were studied and then progressively integrated into the portal.

The portal also needed to incorporate existing online university library services: the library's catalogues plus the collective catalogues of other Catalan and Spanish universities, databases, and e-publications. It also needed to provide personal loans and interlibrary loans in addition to other services.

Furthermore, the portal would incorporate extra-academic online services: communication tools (chat, bulletin boards, and so forth); institutional information promotion channels; La Botiga, an e-commerce application offering university merchandise; or the chance to sign up for university cultural and sports activities.

The incorporation of these online services involved the active cooperation of all the organizational units of the university, and it served as a stimulus to all. University personnel began to view Campus Global as a chance to improve all offline services, as well.

Organizing University Web Publishing

Successful implementation of a single portal for the university community depended both on technological factors and on systematic content organization. In this respect, one of the main problems we faced during the project was that a content management system had not been incorporated during the planning stage. At the time it seemed that HTML would satisfy our Web publishing needs.

The lack of a content management system meant that we had to set up a parallel system that imitated the func-

tions of the automated system as much as possible.

The new Web publishing procedures were based on three tenets:

- **Decentralization**—Content and services would be published directly by the department personnel who produced them.
- **No overlapping**—Published services and contents would no longer overlap. Each would be previously assigned to a specific unit. It became compulsory to link all original contents.
- **Standardization**—A mandatory feature of the portal would be standardized layout and presentation of content and services (the ultimate aim being to reinforce the UPF trademark).

To implement this model, a preliminary study was carried out in March 2000. “An Analysis of Information System Resources” was performed to sketch out the information map of the university. This analysis included all 48 academic and administrative units and identified and described 884 information resources. We came up with a lot of useful information, including the fact that much content was not in electronic format, let alone in HTML; many units considered resources produced by other units to be their own (which could lead to non-exact duplications); and some content came from other IT applications.

Once we had laid out the information map, we had to provide tools that would enable decentralized yet coherent and standardized content creation. To achieve this, university personnel were provided with new tools—the Contents Directory and the Web Guidelines Handbook, which were both made available online.

The Contents Directory had two purposes: to determine which organizational unit was responsible for each piece of content that would be published on the system, and to determine where on the system each piece of content would be published.

The Contents Directory is structured according to organizational units and to content headings. The “organizational units” option lists all the university

Figure 1

Example Organizational Unit Entry

ACADEMIC ADMINISTRATION SERVICE

> **Access to the University**

Scholarships and grants

UPF Students Card

Doctorate Studies Guide

Enrollment

.....

Figure 2

Example Content Headings Entry

A

> **Access to the University**

Access to the second cycle

Agreements and regulations

UPF Activities

Agora

Computer classrooms

.....

Figure 3

Sample Content Card

Content: **ACCESS TO THE UNIVERSITY**

Unit: Academic Administration Service

Where it is published:

1. **WEB:** Courses/First and second cycle/Academic Information
2. **WEB:** High schools and high school students
3. **CAMPUS GLOBAL** (professor and administrative staff profiles): Teaching/Academic Information
4. **CAMPUS GLOBAL** (student profile): Academic secretary/Information

URL:

Catalan	Spanish	English
/spga/acces.htm	/spga/act/cast/acces.htm	/spga/eng/access.htm

units that publish content. On selecting one of these, the user sees a list of the contents provided by the system in alphabetical order (in Catalan).

Figure 1 shows an example organizational unit entry, and Figure 2 shows an example content headings entry. Upon selecting any of the options, a content card appears (see Figure 3).

The aim of the Web Guidelines Handbook was to standardize published contents. The handbook outlines proce-

dures and available resources for creating and publishing information and services on the system. It also presents common working guidelines and specifications in order to ensure standardized formats and optimum quality.

The handbook is divided into five sections: Web Server, Contents, Look and Feel, Work Tools, and Recommendations. Each section contains all the essential information for Web site creation and content publishing on the

Figure 4

Look and Feel Example from Web Guidelines Handbook

LOOK AND FEEL

Campus Global
Websites graphic requirements
CSS templates and styles
Images library
Photo archive
Graphics creation tools
.....

system. Figure 4 shows an example from the Look and Feel section.

We also needed to address matters not covered by existing tools. Internal regulations were needed to legitimize the process, as well as user activity within the system and the technical decisions being made on an ongoing basis. We therefore drew up a number of regulations dealing with basic matters such as who can access the system; terms of access; how to regulate intellectual property rights; how content should be created; how administrative procedures are affected by matters such as electronic signatures; and disciplinary measures.

In May 2000 we created the University Web Net, the last piece in the puzzle. Its aim was to help make the system cohere. This net consists of a member link for each organizational unit that publishes content on the system. The USICE service (or department) uses these links to brief all the units on new Web services and new instructions for publishing on the system.

This working system has functioned very well in the absence of a content management system. Nevertheless, given that it is not an automated system, it relies on mutual trust. In other words, it takes for granted that content publishers will comply with the guidelines and procedures. What's more, it requires monitoring systems, which takes extra time and people. Even so, we can conclude that all the university units have responded positively to the guidelines and have accepted that they must publish their own content in a

uniform way, following the instructions set down by USICE.

At the moment, the implementation of a content management system seems a viable option both politically and economically. A decision has been made not to develop our own system but to introduce commercial software. Given that we are a public university, we are obliged by law to stipulate the system's requirements and put them out to public tender, whereby any company can present a content management system that complies with these requirements. The public tender and the implementation of the new system are set to take place in 2004. As far as we can tell, the integration process will be easy given that the administration and content models presently in use fit perfectly with content management system procedures.

Technological Support

Another challenge we faced was setting up technological support for Campus Global users. Our main worry in this respect was the poor quality of the Internet in Spain, but that was not a problem the university could solve. So we proceeded to consider and adopt alternative measures that would contribute to the project's success.

First we approved a plan that would enable us to increase the number of public computers on campus—in the libraries, laboratories, and computer rooms. This meant a substantial economic investment given that we aimed to have one public computer for every 12 students by the year 2000, the year in which the Campus Global project

would be extended throughout the university. This percentage was very high compared to other Spanish universities. The result was that even though students initially had difficulties in connecting to the Internet from their homes, they could at least have easy Internet access from the university.

What's more, we made an agreement with Telefónica, the main telecommunications company in Spain, aimed at promoting connectivity off campus. The agreement consisted of providing an e-mail address plus free Internet access for all members of the UPF community. Consequently, the university no longer had to keep all those e-mail addresses on its own servers, and users did not have to pay another operator for an Internet connection.

Users could access their e-mail via the Internet, and the system was incorporated into the Campus Global portal. Furthermore, users were not required to identify themselves again once they had logged in to Campus Global.

Finally, a call center was set up at USICE to answer user queries concerning the new Campus Global and help out with any problems. The call center, which is staffed by one person, deals with basic matters such as password changes or access configurations. It refers other problems to the corresponding university service.

This state of affairs has changed a lot in two years. Very fast Internet services have been available since 2001, and many users have hired the service that best suits their needs.

What's more, most users now have a computer and access to the Internet in their own homes, so this has ceased to be a priority issue for the university. Our main concern at the moment is providing wireless access for the entire campus and enabling students to have unrestricted access on their laptops.

Improvements

The Campus Global project came as a response to the new challenges of the information society facing educational institutions in the twenty-first century. One of these demands was to achieve excellence in all aspects of university life.

The benefits the Campus Global portal has brought to UPF have not been sufficiently studied, but all available data point to many improvements at different levels. The simple fact that the UPF is now available online 24 hours a day, 7 days a week from any Internet connection gives us an inkling of the positive repercussions that this has had, as well as of future benefits.

Let us now take a look at the areas where improvements have been seen since the introduction of Campus Global into university life.

Institutional

The existence of a single counter open to all members of the university community is slowly but steadily changing the mentality of the entire organization. The portal has helped reinforce the UPF trademark and strengthen the sense of belonging to the community. Members of the university community now have more knowledge about UPF, and all users can closely follow procedures and the latest developments, even if not actively involved in them.

The portal is also helping improve communication among members of the community, though clearly its success in this area does not depend solely on the fact that the technology has been made available. Campus Global provides tools that promote cross-organizational communication through at least two options: Express Your Opinion, which allows users to send messages directly to the university president; and the forums, which are discussion areas open to the whole community on matters that concern them.

Administration

Setting up of the new information architecture and implementation of the single portal have, to a large extent, enabled us to introduce new work practices among staff members. In turn these have had a direct influence on work quality. Let me point out some examples:

- Campus Global enables staff to work with greater precision using less time by presenting university information in an orderly manner. Official



nomenclature is published directly by the person who wrote it. It can also be updated, avoiding duplication and enabling procedures to be standardized.

- Campus Global also is conducive to a higher degree of efficacy and efficiency. Decision-making processes are improved and speeded up because all the necessary information is instantly available online. Furthermore, certain strategic information is published immediately after it has been generated and reaches the entire community at the same time (for example, the board of trustees' meeting minutes).
- Moreover, the portal has led to a greater degree of integration among staff members. It facilitates collaboration and does away with barriers to knowledge, as well as geographical and architectural barriers. People can

work according to processes. What's more, it saves time—there are fewer internal bulletins and less paperwork. Time saved here can be allocated to planning and decision making.

- The portal also contributes to people management in that it can serve as a motivational tool. Each work area has been given decision-making capabilities, for example. The portal facilitates teamwork (by providing intranets for groups), enables talent management among employees, and provides a space for training—e-learning, using Aula Global.
- Campus Global is also revolutionizing the way information is transmitted inside the university through the key applications AVISOS and NOTÍCIAS (Announcements and News). Besides promoting the flow of knowledge among people, the portal reduces costs in that it does away with tradi-

Table 1**Use of Aula Global in Classrooms, Academic Year 2002–2003***

Undergraduate Studies	Total Number of Classrooms	Classrooms that Have Used Aula Global	Percentage
Business Management and Administration	146	101	69.00%
Biology	49	43	87.75%
Labor Sciences	32	29	90.60%
Business Management	140	79	56.40%
Political and Administration Sciences	57	40	70.10%
Audiovisual Communication	135	63	46.60%
Law	241	117	48.50%
Economics	155	134	86.45%
Computer Science	153	58	37.90%
Public Management and Administration	53	37	69.80%
Humanities	137	72	52.50%
Journalism	88	45	51.13%
Labor Relations	93	52	55.90%
Telecommunications	49	30	61.22%
Translation and Interpretation	535	190	35.51%
Total	2,063	1,090	52.80%

* The percentages shown in this table reflect the use of Aula Global. Some professors use IT technologies that publish materials through other Web servers.

tional methods like internal bulletins, student handbooks, and bulletin boards.

Instruction and Learning

Aula Global is contributing to an in-depth renovation of instruction and learning methods at UPF. Among other things it gives faculty members more control over each student's learning processes. In this way, faculty are more responsible for the whole learning process and not just for teaching their classes. In addition, traditional classroom instruction is seen in a new light within the wider framework of faculty activities.

Furthermore, Aula Global has led to a greater degree of personalization and customization to suit the needs and interests of each student. At one extreme, it has promoted self-learning and prepares students for continuous education. It also facilitates new types of learn-

ing methodologies, such as simulations and teamwork. Students get accustomed to using these technologies as a daily work tool and become advanced users without even realizing it. In the medium term the introduction of Aula Global will most probably turn out to be highly profitable in terms of the economic cost-to-educational-performance ratio.

The University Program for Quality Education is currently in charge of implementing the e-learning platform; its use by faculty is optional. The introduction of Aula Global into the faculty structure was no easy task in a university where instruction consisted primarily of classroom teaching. Special training in how to create multimedia materials was required, along with additional training on how to use the tool itself. In many cases we had to redesign instruction models. In order to promote these initiatives, the university set up a system of annual grants for educational inno-

vation projects, effectively bringing faculty closer to the virtual environment.

Despite initial difficulties, Aula Global has fulfilled its objective. In just two academic years it has come to be used in 52.8 percent of university classrooms as an adjunct to classroom instruction (see Table 1). The initiative has been quickly and warmly received by students as well.

Research

Repercussions in the research area have not been spectacular. This has to do with the nature of Campus Global, which during the initial phase focused more on promoting quality education than on improving research.

Naturally, researchers have benefited from teacher access to the single gateway both on and off campus. Campus Global can facilitate and further cooperation and teamwork dynamics among groups of researchers who already col-

laborate in specific lines of research. An online work area with suitable digital tools can increase research productivity and reinforce teamwork. Some research activities, especially those based on the exchange of information and debate, can be ongoing and unsynchronized, even when a member of the team is at a remote university. The system also facilitates online publication of findings.

Project Implementation

The project needed to be effectively and successfully implemented on a technical level, but it was also important that it reach all members of the university community. To achieve this, access to the Campus Global portal was extended to the entire university community at the beginning of the 2000–2001 academic year, after a two-year trial period with small groups. A detailed implementation plan was drawn up for this purpose, adapted to different user segments.

One of the first lessons we learned was that Campus Global access needed to be much more visible to our users. Initially Campus Global had its own Web site with its own URL. We soon found out how important it was to provide direct access to Campus Global from our institutional Web site. The number of hits increased significantly starting from the day after this change.

The project's impact and its degree of penetration have varied according to each user segment: faculty, students, and administrative staff.

Faculty

During these first years since the introduction of the portal, the faculty have been slowest to adapt to the Campus Global environment. Clearly, the most popular attraction has been Aula Global, though the gradual incorporation of personal services—such as access to payroll information or to the account statements of their research projects—has contributed greatly to building faculty loyalty.

According to usage statistics, all professors access Campus Global at some time or another, but they do not make

The only function of Campus Global that has managed to gain professor loyalty across all academic departments is access to the e-learning platform, Aula Global

use of portal services daily. We consider this not a sign of resistance to the project but rather an indicator that their information needs are largely met through other systems. For example, faculty can access their own departmental Web sites directly via the Internet without entering Campus Global. Only two departments provide restricted access intranets that are accessed via Campus Global.

The only function of Campus Global that has managed to gain professor loyalty across all academic departments is access to the e-learning platform, Aula Global. For two years running it has been used by more than 50 percent of university classrooms (see Table 1). Aula Global is evidently influencing and changing the teaching model at the university, even more so now that professors feel pressured by the Bologna agreements, which aim to promote unified standards for all European universities.

Professors will probably use Campus Global more often as soon as more research resources are available to them via the portal. To this end, we should speed up the incorporation of collaboration tools so that researchers can share and fully take advantage of the knowledge of their colleagues. In the absence of such tools, it is difficult to envisage professors accessing Campus Global on a daily basis. Without daily access, institutional communication is weakened.

Despite these low—though gradually increasing—user rates, the project has always been well received by professors because they stand to gain from its positive repercussions on university management and on improved student learning.

Students

The students were fastest in taking up the Campus Global portal despite slow and unreliable Internet connections in Spain until 2001. Fast connections did not come into widespread use until 2002. The university facilitated student access by increasing the number of public computers and introducing wireless technology on campus. It also launched a campaign whereby students could buy laptop computers at a very good price. Students were also provided with e-mail addresses and free Internet connections.³

The portal's warm reception among the student community can be attributed to a number of factors:

- Many professors expect students to use Aula Global to complement classroom activities.
- It saves time because a lot of academic paperwork can now be carried out online.
- Students received an e-mail address.
- This generation of students is accustomed to using information technologies and communications.

The only source of evaluation we have at our disposal at the moment, apart from usage statistics, is the annual student survey concerning satisfaction with Campus Global. Data for the 2001–2002 academic year provided the following results: 71 percent of students said that they were satisfied with the portal; 84 percent said they found it to be a very useful information tool; 63 percent found it useful as a communication tool; and 58 percent considered it a useful educational tool. What's more, for three consecutive years the most popular functions among students were Aula Global, *Secretaria Acadèmica*—pages where they can view their academic record and carry out academic and administrative procedures—followed by e-mail and *NOTÍCIES*—the university's major information channel.

Apart from the positive effects that Aula Global is having on their learning, Campus Global is also helping students instigate administrative changes. They are demanding more and more that all notices be sent out via Campus Global and not using tra-

ditional communication channels. Students want to make sure that they have access to all available updated information every time they hook up to Campus Global from student housing or their homes. This means that a cultural change has taken place.

Administrative Staff

On the whole everything ran smoothly with the administrative staff. The implementation process was gradual, and there were no objections or demands on the part of personnel despite an initial extra work load—many of them were asked to put in extra effort and publish information about their work on the system. Their loyalty was guaranteed gradually as new functions were introduced that were directly related to their responsibilities, together with more personal functions such as online access to payroll information and personnel work-hours information.⁴

Administrative staff basically use Campus Global as an information tool to answer questions such as What's the name of such-and-such a department? What's the address of such-and-such a school? To what department does professor so-and-so belong to? In what meeting was a certain matter agreed upon? This dependence is making staff members aware of how important it is to have completely updated and comprehensive information published on Campus Global.

The cultural change planned by the university has also taken place in administration. All administrative procedures are currently in some way related to Campus Global. The main drawback in this respect is perhaps the fact that we do not have the essential collaboration tools that would enable us to fully take advantage of knowledge that university administrative staff have accumulated around their areas of work. Future projects should target this area.

Summing Up Progress

The Campus Global project set a clear objective—to change the university in a specific way. The aim was



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to make it function more efficiently and effectively and thus promote better teaching and learning.

Everything seems to point to the fact that we are undergoing a change of mentality that will transform the university in coming years. These changes are ongoing, and Campus Global has paved the way for them to take place. A good example of these changes is all the improvements just mentioned. However, a documented report is not yet available on the impact Campus Global has had on the organization as a whole.

The Present State of Affairs

Campus Global is now into its third academic year,⁵ and the project still has a key role to play in instigating change at UPF. Furthermore, since October 2002 another Spanish university, the Universidad Carlos III of Madrid, has joined the project.

The most evident outcome of the whole endeavor is that UPF has fulfilled its initial objective, implementing the widespread use of digital culture within the organization. This is confirmed by available data:

- 85.7 percent of students⁶ now have a computer at home as well as an

Internet connection;

- the UPF Web site is one of the most frequently visited university Web sites in Catalan, including those of the big universities;
 - members of the university community now prefer to carry out their administrative paperwork online rather than in person; and
 - the use of Aula Global as a complement to classroom instruction is steadily on the rise.
- The challenges ahead are to
- consolidate loyalty among all members of the University community;
 - offer a wider range of options to users and proceed to customize the portal even further;
 - introduce a content management system for facilitating Web publishing (in order to facilitate knowledge management);
 - introduce personal digital signatures for some administrative procedures; and
 - adapt Aula Global to meet the international IMS/SCORM standards for interoperable learning technology.

The main challenges on an organizational level are to properly manage the existing system and adequately channel new needs, proposals, and suggestions put forward by the members of university bodies. Campus Global will continue to be an ongoing strategic objective of UPF in the years to come. *e*

Endnotes

1. See <<http://www.upf.edu>>.
2. ARIADNA is a name taken from ancient Greek mythology.
3. This offer was for the link-up only and did not include the cost of calls.
4. University personnel must clock in and out.
5. This is for the 2002–2003 academic year.
6. According to statistics from the student survey at the start of the 2002–2003 academic year.

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