



EDUCATION AND CULTURE

# LEONARDO DA VINCI

Second phase:2000-2006

## Project: Megatrends in E-learning Provision

([www.nettskolen.com/in\\_english/megatrends](http://www.nettskolen.com/in_english/megatrends))

## Universidad Politécnica de Madrid-GATE (Gabinete de Tele-Educación) Case study

### Facts about the institution

Name of institution	Polytechnic University of Madrid (Universidad Politécnica de Madrid - UPM) GATE (Gabinete de Tele-Educación)
URL of institution	<a href="http://www.upm.es">www.upm.es</a>
Country	Spain
Number of employees GATE	20
Levels in the education system	Higher education level

### Introduction

The UPM is a public university located in the capital of Spain. The majority of its centres were founded in the 18th and 19th centuries. Each of them maintained its independence until being grouped together to form the UPM in 1971. Being a public university, UPM operates on a non-profit basis and is integrated in the Spanish higher education system.

The interview focuses on GATE (Gabinete de Tele-Educación), a department attached to the Vice Presidency of New Technologies and Web Based Services (Vicerrectorado de Nuevas Tecnologías y Servicios en Red). The main functions of GATE are:

- a) To provide support to teachers that wish to integrate ICT in their teaching processes
- b) To develop the university's virtual campus in collaboration with the service for computer science
- c) To collaborate in different projects and initiatives related to distance education
- d) To develop online courses for graduate students (optional courses), continuing training courses and training courses for the university's teaching and administrative personnel.

The VLE used to deliver e-learning is MOODLE.

In the year 2005, 110 different courses were provided and there were 14.000 course enrolments.

The courses belong to the segment of higher education and to the field of continuing training in the case of the programmes directed to the university's staff.



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### **Contextual factors concerning online education in Spain**

The UPM is a well known institution in the fields of technical studies. Therefore it not only focuses on the wider area of Madrid but also on the whole country. The total population of Spain is 40 million. Spanish is the common language in all 17 autonomous regions, three of which have an own language with official status within the region.

There currently exist 70 universities in Spain, 48 of which are public. The total number of registered students in Spanish universities for the academic year 2004/05 was 1.535.626.

The results of the European e-user-Project<sup>1</sup> describe the diffusion of ICT in Spain unsatisfactory due to the low penetration of Internet in the households in comparison to the other EU members which could be related to the high prices of Internet connection.

Broadband diffusion, however, has been comparatively fast in the last three years, in particular in the more developed and urban parts of the country such as Catalonia and Madrid.

The same study reports considerably big disparities in access to and use of the Internet between sub-segments of the population e.g. genders, age groups, socio-economic groups etc.

The acceptance of e-learning within university students can be considered as relatively high. In spite of the lack of diffusion of ICTs and the disparities mentioned above, the large number of e-learning initiatives in Spanish universities indicate a satisfactory level of acceptance of the use of ICT in teaching and learning among the academic community.

It can be assumed that digital literacy in the target group is relatively high. Spanish university students and teachers use computers and the Internet on a regular basis. However the percentage of the total number of Spanish people aged 16 to 74 that do not use the computer or the Internet is slightly higher than the same figure for the UE-25.<sup>2</sup>

Neither the central government nor the regional administrations are carrying out a specific policy in order to promoting e-learning. The projects that are being undertaken are more generic and only have an indirect effect on the development of e-learning. Examples are the provision of equipments and access to ICT for schools, the development of Internet courses and training, the support of innovation and development in educational applications of ICT, the cooperation between Latin America and Europe in the area of ICT in education, projects supported by the government through the European Social Fund and through the Spanish Continuing Training Foundation FORCEM, the promotion of ICTs in enterprises that offer e-learning courses through FORINTEL (a program created by the Ministry of Industry,

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<sup>1</sup> [www.euser-eu.org](http://www.euser-eu.org)

<sup>2</sup> DEMUNTER, Christophe (2006): "How skilled are Europeans in using computers and the Internet?" [Online article]. In: *Statistics on focus. Industry, trade and services* 17/2006. (Data retrieved on 30/10/2006). URL: [http://epp.eurostat.ec.europa.eu/cache/ITY\\_OFFPUB/KS-NP-06-017/EN/KS-NP-06-017-EN.PDF](http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-NP-06-017/EN/KS-NP-06-017-EN.PDF)



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Tourism and Commerce) or the "Plan España.es" that promotes accessibility to training and digital contents.

### **History**

The GATE (Gabinete de Tele-Educación) was created in 1991 in order to integrate ICT in the UPM's educational program. The main activities of the cabinet are to coordinate the e-learning courses offered in the university and to give support and training to teachers and staff that wish to provide online teaching to their students. This training includes technical as well as pedagogical aspects. However, online training started in 2000. Since then, the courses that are offered have changed considerably and the target group has grown. The growth of the project can be described with the following figures:

Higher education courses: From initially 29 to now 67.

Continuing training courses: From initially 12 to now 35.

Courses for the university's personnel: Started in 2005. Currently 12 courses.

The strategy is mainly based on carrying out experimental projects that are analyzed, evaluated and conceptualized by the GATE in order to make them extensible for general use. Hence, the development of e-learning competence relies up to a considerable extent on individual initiatives that are gathered by the cabinet in order to turn them into feasible projects applicable to the institution's educative program. It can therefore be considered a slow process that moves forward step by step driven by individual initiatives that are mediated and monitored by the GATE. It possibly is the bottom-up approach that has contributed to the success of the university's e-learning activity so far. Thanks to this approach new projects were more likely to cover real needs.

A very important factor that characterizes the development of e-learning programmes by the GATE is evaluation which has been a key instrument in the implementation and application process of e-learning projects and courses since the beginning of the cabinet's activity. The teaching materials and particularly the teaching processes are evaluated continuously with the help of questionnaires for teachers and students and employing observers that follow the course activities and check the resources, the contents and the learning activities "in situ". Obviously the learning process of each student is also subject to evaluation. The results of these evaluation routines are summarized in a report at the end of the term and handed out to the teachers so that they can work on it as a basis document that indicates possible needs of improvement. The evaluation activity as a whole has generated and is based on a book of good practice.

In addition to the evaluation processes, GATE runs a technological observatory that carries out research on pedagogical and technical issues in the e-learning context. The observatory is an important instrument to keep the institution up to date. One interesting example is the evaluation of a large number of e-learning platforms undertaken by the GATE and the Department of Electronic systems and Control (SEC). The project's results played a substantial role in the decision of choosing MOODLE as the university's VLE.



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### **Technical issues**

The e-learning courses at UPM are always based on widely used technology in order to make sure that every student can access and run the courses without any special skills or additional hardware or software. The only thing necessary to be able to follow a UPM online course is a computer with a standard configuration and an Internet connection. This form of accessibility is considered a key issue for success because it makes the institution's courses broadly available.

All e-learning activity that happens in and around GATE is based on MOODLE as the institutional VLE running in the institution. Although it is true that there are some own developments in the field of learning management systems within the university as a whole, like AulaWeb and ARFO, in the specific context of the distance learning cabinet it is certainly an advantage not having to deal with several different systems and the need to integrate them under a common purpose. The GATE decided to use MOODLE, because it is a very comprehensive platform regarding the numerous resources it offers and after having analyzed the results of the mentioned evaluation of e-learning platforms. It was considered important not to depend on the services of a commercial provider and to be able to introduce as many changes as necessary in the original configuration or code of the application in order to adapt it to the institution's needs and requirements. Another factor worth to mention is to see that there is an important academic community that uses and improves MOODLE constantly.

The administrative system, and here we're mainly talking about enrolments and registrations, runs with ORACLE. The integration of both systems, MOODLE and ORACLE, is not always easy and it was necessary to develop intermediate applications in order to ensure a correct communication between the two systems. Another complicated point is the certification process, particularly in continuing training courses.

### **Courses**

The courses offered in the UPM context belong to the field of higher education and continuing training. Nearly all subjects offered through the GATE are related to engineering and architecture. These very technical fields are certainly "onlineable" but sometimes require the development of special tools and applications that are used in the virtual laboratory.

In addition to these technical challenges there are other difficulties that are more closely related to online teaching and learning itself: The GATE's courses are largely based on asynchronous communication and characterized by an intensive use of virtual communication and collaboration tools, such as forums, WIKIS etc. It is sometimes difficult to find topics or problems that are open enough to be discussed and debated on. The very technical character of the subjects generates declarative and conceptual knowledge that is very little susceptible to debating and negotiating. However, the course design takes this difficulty into account and offers many



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complex learning activities like case studies and problem based learning in order to make a collaborative approach easier to be carried out.

The intensive use of communication tools in online learning is considered a key factor for success. Communication and collaboration creates a group consciousness and supports a meaningful and efficient learning process. The UPM doesn't understand e-learning as a form of ICT-based content provision. Not only the academic aspects of online activity are taken into account, but also the social perspective of togetherness in virtual environments, which can be an important and even decisive basis for a good teaching and learning performance.

However, there is no flexible start-up and progression. A determined and structured time organization is considered a valuable help for the students in their task of managing their online learning experience.

### **Management, strategy and attitudes**

The unconditional support of the presidency of the university has certainly been decisive when it came to providing means, approve initiatives, create spaces and canalize projects towards the GATE.

Thanks to the mediated bottom-up approach followed by the institution where the first initiative rests with the individual employee but which at the same time provides effective guidance, the attitude of the staff has changed from an initial scepticism to a considerable amount of interest and proactive approaches. Apart from the increased familiarity and even expertise with e-learning and its related issues, the reformation of the university's study plans according to the Bologna process has certainly contributed to a higher degree of consciousness and acceptance of online approaches as valid tools to achieve the necessary changes in the system.

The considerable increase of the workload by taking responsibility in an online course is a key issue that is addressed already at the design stage of the courses. The intention is to limit the teacher's active role without jeopardizing the communicative approach. Every teacher that is interested in designing an online course receives an 80 hour training package in order to help him to take correct decisions and prevent him from designing learning experiences that might not be feasible due to the big amount of work they would generate.

In the whole process of implementation and application of e-learning, quality is considered a key factor for success. GATE has a whole unit dedicated exclusively to quality. The aim is to achieve a progressive improvement of all aspects of e-learning through constant evaluation before, during and after the process or experience. There are mechanisms and institutions for internal and external evaluation.

The effectiveness of the administrative routines can be described as satisfactory.



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As a key factor stands the fact that the routines and tools have been developed by the institution itself which certainly guarantees a high degree of adjustment to particular needs and requirements.

The collaboration with other educational institutions is frequent, fluid and certainly positive under the aspect of mutual enrichment. Collaboration, benchmarking, exchange of ideas, sharing training, courses and experiences (for example with universities in Latin America) has clearly contributed to success.

Being a public university, the credibility of the UPM with the government and the public administration is total.

### **Economy**

As a public university the UPM has to be considered a service that is not subject to economic parameters. However, the cost-effectiveness in the area of continuing training is certainly satisfactory although the income is neither stable nor predictable due to the fluctuation of the number of registered students.

The institution keeps a high degree of flexibility on the technical side in order to guarantee an ongoing validity of the created courses and resources. This is mainly undertaken by following the main standards that operate in the field of e-learning.

Flexible employment is necessary in a field that does not allow exact prediction on volume and needs. The GATE keeps a flexible pool of part-time employees that can be activated according to the upcoming needs. Some of these needs are covered by trainees. Currently the "Gabinete de Tele-Educación" has 20 people employed, 11 of which have regular work contracts.

### **Conclusions**

The important factors for UPM's success and survival as a mega provider of online education are:

- The mediated bottom-up approach which leads to an online course provision that meets the real needs of the institution and implies teachers as an active part in design and implementation processes improving motivation and skills.
- The pedagogical approach based on communication and collaborative learning activities which helps to keep interest and motivation on a reasonable level and avoids student's isolation in self-learning contexts that could lead to a higher drop-out rate.
- The use of an open source VLE which allowed adapting the system to the specific needs of the institution at a very low cost.
- The strong support given by management.
- An efficient evaluation system which provides clear data allowing constant improvement.