ON THE PROVISION AND USE OF E-TEACHING SERVICES AT THE UNIVERSITY OF ATHENS

Pantelis Balaouras, Costas Tsibanis, Spiros Bolis and Lazaros Merakos
University of Athens
Greece

Abstract

We present (a) the strategy at the University of Athens (UoA) to involve its faculty in the use of *e-teaching services*, and (b) the model adopted by the UoA Network Operations Center (NOC) for the support of e-teaching, content creation and other services that strengthen the competence of UoA's academic community. In examing the degree of penetration of these services in the teaching community, we elaborate on the reasons why teachers choose to use or not use them, focusing on the faculty of the *Department of Informatics and Telecommunications*. We also present our efforts to create and inspire a digital culture within UoA, and how such is being promoted at the national level, through the Greek Universities Network (GUnet). Finally, we briefly comment on how levels of individual eCompetence may be increased in a higher education institution.

1. Introduction

The University of Athens (UoA)[1] is a typical large European university[2], which is in the process of incorporating Information and Communications Technologies (ICT) services in its teaching procedures. UoA does not serve as an "open university", and thus, it focuses on e-teaching services that facilitate student access to the educational content in a pedagogical and cost-effective way rather than distance learning through eLearning services.

At UoA, the Network Operations Center (NOC)[3] is responsible for the administrative and technical support of basic and advanced networking and telematic services. Specifically, NOC staff are responsible for the installation, operation and management of (a) the UoA network that interconnects about 120 buildings to the Internet over a high speed network, (b) basic services such as email, telephony, dial-up and helpdesk services and (c) advanced telematic services, such as video-conferencing, video-broadcasting, video-on-demand and educational content management. The latter may be referred to as *e-teaching services* since they focus on supporting teachers in their teaching and R&D tasks. Extending this definition, *eLearning services* may be considered as a superset of e-teaching services, aiming to support the student's learning process in a learner-centric educational approach. This approach is often based on a limited face-to-face student-teacher communication and the extensive exploitation of ICT for providing interactive communication. Within UoA, however, the priority is on using ICT to support (and, ultimately, extend) traditional university teaching.

Additionally, NOC is participating in the Greek Universities Network (GUnet)[4] - a joint effort undertaken by all Greek academic institutions towards the creation of a nationwide, high speed

[1] National and Kapodistrian University of Athens (UoA). http://www.uoa.gr

[2] Six schools, a total of twenty-nine departments distributed in five campuses, more than 35,000 undergraduate students, 4,000 graduate students, 2,200 faculty members, 4,000 other teaching, research, and administrative staff.

[3] Network Operations Center of UoA. http://www.noc.uoa.gr

[4] Greek Universities Network. http://www.gunet.gr

The Challenge of eCompetence in Academic Staff Development, Mac Labhrainn, I., McDonald Legg, C., Schneckenberg, D., Wildt, J., Galway: CELT, 2006.

network used as a platform for advanced telematic applications. GUnet serves also as a knowledge dissemination mechanism and a network of excellence at the national level, focusing on supporting faculty members in using e-teaching and multimedia content production services. NOC is also participating in a nationwide project called the Greek School Network[5], providing Internet access and related services to more than 12,000 primary and secondary level schools.

2. Strategic direction

The deployment and provision of e-teaching services is a strategic choice for UoA, GUnet, and the Hellenic (Greek) Ministry of Education[6]. Since the European Summit in Lisbon, educational policy in Europe has been depicted as a primary promoter for development and welfare at both the individual and collective level. Educational policy is a priority for Europe to become "the most competitive and dynamic economy in the world based on knowledge" until 2010. In this context, the Greek government has launched the Operational Programmes (OP) of "Information Society"[7] and "Education"[8]. UoA and GUnet are funded in the context of OPs "Education" and "Information Society" in order to deploy and provide e-teaching services.

3. Designing and incorporating e-teaching services

UoA's NOC and GUnet promote the incorporation of ICT into the everyday educational process by investigating appropriate e-teaching scenarios and providing services in order to cover the needs of those teachers who are self-driven in using such services (early adopters). The following criteria were taken into account in the design of the services offered.

- *Friendliness to teachers.* Teachers do not have to change the way they teach. Thus, the usage of new tools/services is a motivation for improving their teaching performance and not a disincentive due to the time required for adapting their way of teaching. Notably, this approach has facilitated the creation of a group of early adopters.[9]

- *Technical feasibility.* This includes the detailed design and testing of the e-teaching scenarios, as well as the support procedures prior to their provision. A major decision parameter during the investigation of a scenario is the degree of technical scalability (in terms of numbers of users) and the support procedures. Another parameter was the usage of the infrastructure by more than one service, e.g., e-teaching classrooms serving additionally as recording studios. Further, solutions that follow open standards and open software with no licensing costs have been adopted wherever possible.

- *Financial viability.* The cost of providing e-teaching services should be low to be viable. In order to reduce the cost of the software, open software with no licensing is exploited by UoA. Furthermore, to reduce the cost of development, software developed by the GUnet is used and common resources shared by all the higher education institutions in Greece are used. For instance, equipment of the Greek National Research Network (GRnet)[10] is used for video-streaming and multiparty video conferencing.

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[5] Greek School Network. http://www.sch.gr
[6] Hellenic (Greek) Ministry of Education and Religious Affairs. http://www.ypepth.gr
[7] Operational Program Infosoc. http://www.infosoc.gr ; http://www.ypepth.gr/ktp/en_home.htm
[8] Operational Program "Education". http://www.epeaek.gr
[9] Of course, technical support is also provided in the use of the tools and services to save time for the teacher and allow him/her to focus on teaching
[10] Greek Research Network. http://www.gunet.gr

A step-by-step approach is adopted for incorporating e-teaching services at UoA. The first step is to create the proper digital culture in the university community. The Department of Informatics and Telecommunication is used as a "battering ram", since its teaching staff is the most familiar with technology and the integration of new e-teaching services in their every day tasks underpins their philosophy. It is planned to promote this department as a successful user of e-teaching services in order to create a healthy competition among the different departments, extending this approach via dissemination through GUnet.

The next step is to offer new tools and services, such as those presented in Grigoriadou (2000,2003) and Papanikolaou (2002,2003), that will allow for a smooth change from the traditional lecturer mode (i.e., teacher-centric approach), in due course, to the moderator and facilitator mode of the learning process (i.e., learner-centric approach). The ultimate long term aim is to support not only self-directed learning for our students but also lifelong learning by exploiting eLearning.

3.1 *The e-Class platform*

GUnet, under the coordination of the UoA team, has developed its own asynchronous eLearning platform, referred to as *e-Class*, based on the open-source software classroom-online (claroline). The e-Class platform is available at no cost (more than 383 downloads of version 1.5, and 98 of the latest version 1.6 (since 18/11/2005) for installation at Greek HE institutions (HEIs) have been realised). Currently, there are 49 official installations of GUnet's e-Class.

The provision of the e-Class platform at the national level includes the following activities and actors.

1. GUnet serves as a horizontal actor (actor 1: service provider). It provides the e-Class platform to all HEIs. The aforementioned service includes the following activities:

    a. GUnet is responsible for the maintenance of the source code and the incorporation of new functionality and features in the e-Class platform (activity 1). The users, i.e., teachers and technical staff from the HEIs provide for the users requirements regarding the enhancements and new features.

    b. GUnet is also responsible for the source distribution and technical support, regarding the software installation and administration management, through its help-desk (activity 2).

    c. Finally, GUnet offers e-Class as a service to individual teachers (activity 3).

2. HEIs (actor 2: users) may choose their own solutions regarding eLearning. There is no national policy that enforces the use of e-Class. However, e-Class is widely used by HEIs. All HEIs were funded by the Ministry of Education (actor 3) to deploy e-teaching services, and make the course-content available to the students over the Internet. GUnet launched e-Class exactly at that time, and since e-Class was fulfilling their main needs, it was widely adopted.

3. The Ministry of Education is in charge of funding GUnet and the HEIs. GUnet is funded for providing services and coordination whereas HEIs are funded to incorporate ICT in their everyday practices.

Regarding dissemination, GUnet has launched a web-site where all the information about e-Class is available. An email list is also available for announcing the latest news and providing technical consultation. The e-Class website has been promoted in a GUnet symposium, with participation of academic and technical staff from all HEIs. Information and training days, publications, etc are also part of this general strategy.

3.2 *GU-MediaCenter*

GUnet has also established the "GU-MediaCenter," which aims at supporting both the academic staff to use e-teaching services, and the technical staff of the GUnet member institutions to deploy and support such services at their institutions. The GU-MediaCenter has the following specific objectives:

- Promote the services presented in Table 1 to the teaching staff of all HEIs. This is achieved by a) providing these services, b) providing "how to use" guidelines for the teachers and other training material, c) training the technical staff on supporting and promoting such services within their institutes.
- Contribute to the technological evolution of the field of eLearning and new media by developing new services and maintaining the state-of-the art status of its services and infrastructure.
- Investigate and disseminate the proper pedagogical methods, teaching scenarios and didactic design for e-teaching and e-training.

Content provision over the Internet and management of the teaching material through the use of the e-Class platform
Video production by using GU-MediaCenter as a studio for recording lectures
Synchronous e-teaching connecting two or more e-teaching classrooms via videoconferencing
Videoconference and telecooperation
Digitisation of video and teaching material
Montage and transcoding of digital video
DVD production
Providing access to Video on Demand services, that is, uploading the video presentations and making them available to the students over the Internet
Video recording and broadcasting of conferences
Technical consulting on deploying and using eLearning services
Production of "how to use" guidelines for the training of technical staff and teachers
Training of technical staff in supporting the aforementioned services

Table 1: Services provided by the GU-Media Center

4. Providing e-teaching services at UoA

Two models are currently supported.

4.1 *Synchronous e-teaching*

The synchronous e-teaching model deployed at UoA uses *video conferencing* and *video broadcasting services* to facilitate *synchronous teaching* (simultaneous participation of the teacher and learners with real-time interaction among the participants).

Synchronous e-teaching classrooms

In the case of e-teaching, the dispersed classrooms are connected through the university network. Audio-visual and video-conferencing equipment is required for two-way interaction based on the exchange of audio-video signals and teaching material. Presently, UoA's e-teaching infrastructure consists of two classrooms, referred to as e-teaching classrooms, while two new e-teaching classrooms

are under construction. Also, at least one e-teaching classroom is available at each higher education institute in Greece, forming a national network of e-teaching classrooms[11]. The available equipment allows for the simultaneous connection of up to eight classrooms. For the potential and limitations of such classrooms the reader is referred to Balaouras (2000), whereas for the pedagogical assessment scenario to Balaouras (2004) and Mouzakis (2004). The usage of e-teaching classrooms at UoA is restricted to the following scenarios:

a. Seminars organised by the Department of Informatics and Telecommunications can be attended by staff of other universities.

b. Project collaboration with videoconferencing.

This limited set of usage scenarios is due to the following reasons:

- Until recently, there were only a limited number of e-teaching classrooms at the other higher education institutes in Greece; most of the universities have completed the construction of their classrooms in the last six months. Apart from the high cost, which was covered by the Ministry of Education, the lack of available and suitable rooms to become e-teaching classrooms is always a factor that delays implementation.

- There is no tradition and no formal framework for inter-institutional teaching among the Greek universities. There exist a limited number of inter-institutional graduate programmes; however, the idea of using the e-teaching classrooms facilities is neither mature nor properly promoted.

- The limited awareness of the academic staff about the availability of such e-teaching classrooms at UoA and at national level.

The technical staff of UoA were aware of all the factors listed above, and have designed the e-teaching classrooms to serve additionally as a studio for producing high quality video recording of lectures. In this way, education content is produced and offered online to the students by exploiting Video on Demand (VoD) servers. The students can access the content at their own time from any location on campus or even from their home through the content management service, e-Class.

The classrooms host an average of 2.5 sessions per week, one for seminars and 1.5 for project collaboration. In order to increase the usage, both promotion and co-ordination actions are planned.

Lecture broadcasting

Apart from the e-teaching classrooms that enable two-way interaction, video-streaming services for the live broadcasting of lectures over the Internet are under examination. A pilot service is currently offered to the students of the Department of Informatics and Telecommunications. They can remotely attend the lecture given in a specific classroom. Apart from the audio/video of the teacher, the slides and the content of the blackboard are broadcast as well.

The advantage of live broadcasting over video conferencing is that the required equipment cost is significantly lower than the cost of an e-teaching classroom, and the student cost is zero. This potentially will allow for the scaling of lecture broadcasting from all the classrooms at UoA. The disadvantage is that there is no interaction between the students and the teacher. Presently, real time student questions are not supported. This disadvantage may be alleviated by using parallel emails and/or a text-based chat application as a feedback channel. Another problem that may arise is the intellectual property rights of the lecturers. This is partly solved by enabling password protected access.

[11] National Network of e-teaching classrooms: http://mc.gunet.gr/universities/025.htm

An average of 20 students out of 120 attends the lectures remotely (16.6 %). This percentage is expected to increase when this service will be extended to all the lectures given in the Department of Informatics and Telecommunications. A survey based on questionnaires is being planned to capture the opinion of the students and faculty regarding this service.

4.2 *Asynchronous e-teaching*

The asynchronous e-teaching model is deployed by using (i) the UoA's Media Center's facilities for producing and delivering multimedia-based content and (ii) the e-Class platform for managing the course contents.

Multimedia production

The UoA's Media Center provides the set of services presented in Table 1 for supporting synchronous and asynchronous e-teaching. UoA's MediaCenter is co-located with GUnet's MediaCenter. Presently, the usage of the above services is limited to the "early adopter" user groups.

The e-Class platform

The e-Class platform (http://eclass.uoa.gr/) is used for providing asynchronous e-teaching services to the academic community of UoA. E-Class is a content management tool that enables the creation of basic virtual learning environments. The platform has been designed as an enhancement *supporting* the traditional teaching process and *not as its substitute*. The e-Class platform is provided by GUnet as an open source and is widely used by the Greek universities. More than 1000 courses have been developed by several Greek universities. E-Class was selected because it meets the following requirements of faculty, students and administrative staff:

- The academic staff need an "easy-to-use" tool for managing and presenting course material over the Internet.
- Students request web-based access to course material.
- The solution should be cost-effective and open to future functionality enhancements.

The basic characteristics of the e-Class platform are the following: discrete user roles, course accessibility options, structured presentation of the courses, user-friendly access and course creation. It supports three types of users: the professor, the student and the administrator. The main role of the *professor* is to create and manage the courses. The professor can also manage the student roster, create student groups and self evaluation tests, organise the structure of the courses and upload the teaching material (e.g., documents, presentations, and video). The professor accounts are created on demand by the e-Class administrators. The *students* are able to register in courses in the platform according to their permissions, take part in project teams and conversation groups, study the teaching material, submit their assignments and take self evaluation tests. The user accounts are automatically created when registered in the platform. Finally, the *administrator* is the supervisor of the platform: creates professor accounts, manages and refreshes (for the next semester) the courses, controls user accounts, and manages the database. More specifically the components that each e-course consists of (see Figure 1), are:

Figure 1: Components of e-Class

1. **Agenda** presents the crucial events of the course in time order (lectures, meetings, etc).
2. **Documents** consist of the teaching material of the course (documents, presentations, etc).
3. **Announcements** concerning the course and information for the students.
4. **Forums** where students can form conversation groups and exchange opinions about the respective courses.
5. **Groups (open or closed)** consisting of students and professors.
6. **Links** on the web concerning the specific course.
7. **Student papers** is the place where the students upload their exercises.
8. **Users** displays the individuals registered in the course, giving their names, their role (student, professor, administrator) and their email.
9. Self evaluation **Exercises** created by the professor of the course.
10. **Course Description** where information is given about the goals, the structure of the course, the professors who support it, etc.
11. **Video** is the place where URLs of the recorded lectures are presented.
12. **Chat** where conversation can take place in real time.

The e-Class platform has had a high degree of penetration in numerous Greek university departments. Table 2 gives the number of registered students and professors and the number of courses for two separate installations of e-Class at UoA.

Number of	Department of Informatics and Telecommunications	Central platform for UoA
registered students	1421 (95%)	10686 (32.%)
registered teachers	72 (100%)	231 (10.%)
e-lessons created in the platform	264 (100%)	386 (n/a)

Table 2: Statistics about e-Class at UoA

Analysis reveals that although e-Class is implemented in a number of Greek HEIs the majority of teachers only exploit the minimum platform functionality such as using it to distribute course descriptions, lecture notes, etc. Only a small number use the full set of tools, particularly discussion forums, online exercises/assessment, video-files, etc. This is possibly a reflection of the prevailing model of teaching in Greek HEIs which concentrates mainly on face-to-face traditional classroom based practice. In general terms, however, the spread of e-Class has achieved its intended broad goals of: (a) being easy to use for teaching staff; (b) well accepted by administrative and technical staff; (c) enthusiastically received by students.

4.3 *Training Actions*

A more detailed seminar programme in e-teaching is planned which will use common training materials developed under the auspices of GUnet. This seminar will be recorded and the video presentations – along with other material - will be available through GUnet's central installation of e-Class, not only to UoA's teaching community but to the teaching community of all Greek HEIs as well. The teachers will be trained in the following subjects:

- E-teaching classrooms and video-conference equipment.
- Live broadcast of the lectures.
- Video production of the lectures.
- Asynchronous platform e-Class.
- Archiving and retrieving digital medical images.

Apart from the teachers' training, the technical staff responsible for supporting ICT at the UoA's departments will be trained as well. Specifically, they will be trained on how to:

- continuously promote the e-teaching services provided centrally by NOC
- support the teachers in creating multimedia content and using the e-teaching services.

5. Increasing eCompetence in HEI's

In this section, we briefly comment on issues that may help an HEI to improve its eCompetence.

The HEI *administration* should give priority to the provision of complete eLearning services to the students. The issue is to realise the current switch from teaching to learning, and not just going after general "top-down" targets set by the national government and EU. The HEI should continuously adapt the structure and the administrative and teaching procedures in order to increase its eCompetence.

The *technical staff* of the HEI service unit that provides eLearning services, such as the NOC at UoA, should not be restricted to the technical provision and support of services, but should develop communications and organisational skills, as well. The users, i.e., the teachers, should be considered as clients, and the service unit should:

- fulfil the actual needs of the teachers and always receive feedback on the type and quality of the provided services;
- be proactive in informing the users on the eLearning service offerings instead of waiting for the users' inquiries;
- provide the services in an integrated way, including coordination, promotion and training actions.

In our opinion, the above points are key competence skills of the service unit and its staff.

A *unit* for *supporting teaching, learning and staff development* from the *pedagogical perspective* has to be established in each HEI, which should closely cooperate with the eLearning service unit. This unit should advise teachers on how to i) improve their teaching through ICT and ii) evaluate the effectiveness on the students' learning.

The competence of the teaching staff in an HEI is self-evident; what is required is to develop their eCompetence skills. Teachers should:

- be aware about the benefits of using ICT and eLearning services
- know how to find information on using the new technology and services from both the technical and the pedagogical perspective
- use ICT and eLearning services effectively.

6. Conclusions

Education at UoA, and in the other HEIs in Greece, is rather teacher-centric. A set of e-teaching services that follow the asynchronous and synchronous e-teaching models is being offered to the UoA teaching staff by NOC. Regarding the usage of e-teaching services, an "early adopters" community (about 13% of UoA teaching staff) uses the asynchronous services, whereas an "innovators" community uses the synchronous services. In order to increase the usage of these services, promotion and training actions are carried out. Presently, the efforts focus on the Department of Informatics and Telecommunications, in order to create a successful example for the other departments to follow. The primary objective is to create a digital culture in the UoA teaching community by using this first generation of e-teaching services. The next step is to introduce a new set of eLearning services that will enable a smooth and transparent introduction and support of the learner-centric approach along with the current teacher-centric approach.

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Authors:
Pantelis Balaouras, Costas Tsibanis, Spiros Bolis and Lazaros Merakos
Network Operations Center, University of Athens
15784 Athens, Greece
p.balaouras@noc.uoa.gr, k.tsibanis@noc.uoa.gr, sbol@noc.uoa.gr, merakos@di.uoa.gr