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# ICT IN HIGHER EDUCATION: A CASE STUDY OF MEDIATED BLENDED-LEARNING AT THE UNIVERSITY OF AVEIRO

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# ICT IN HIGHER EDUCATION: A CASE STUDY OF MEDIATED BLENDED-LEARNING AT THE UNIVERSITY OF AVEIRO

**ABSTRACT**
Teaching in on-line and collaborative situations requires a variety of responses including changes in pedagogy as instructors taking the role of facilitators of information while guiding students toward solutions. In order for online learning to be successful, therefore, teachers as well as learners will need to explore new roles in the teaching-learning relationship. In this paper, the authors propose to examine how educators can mediate instruction by first designing their course goals and objectives and then consider how the on-line environment can best serve the instructional objectives and plan appropriate activities and assessment. We seek to explore the use of online environments as the bridge between real world and reflective knowledge.

**KEY WORDS**
ICT, new approaches to teaching and learning in HE, blended-learning, mediated instruction.

## 1. Introduction

The advent of technology world wide has been fuelled by 'killer aps' or applications that not just meet of a user a need by redefine the whole process. One of the first big killers aps was spreadsheet software that has revolutionised not just small businesses, but international banks. The key to the success of such applications is that they are authorware, they allow for the design and creation of individualised knowledge. They allow ordinary people to operate at levels far above their previous capacity both in terms of effectiveness and professionalism.

Distance learning has been in existence for a long time, offering students the advantage of flexible study [1] but only recently has it evolved in such a way that teachers are key to the design process of the learning. It is this process we wish to explore here as we believe it will be fundamental to a paradigm shift in teaching and learning.

Laurillard [2] in her book on *Rethinking University Teaching* calls for a new paradigm – that of mediating learning - in first understanding and thus strengthening the role of the university lecture in light of the advances of modern technology. She argues that the nature of teaching in higher education is dual fold in that the academic must not simply impact decontextualised knowledge, but also situate knowledge in real-world activity. The work of Newman and Brown [3] proposes that learning takes place best in an environment that 'situates cognition'; or provides cognitive apprenticeships. Luarillard [2] argues however that this is difficult due to the fact that at the university level the professor must create artificial environments that are capable of anchoring learning or bridging the gap between the everyday knowledge of the world and our ability to reflect academically on that knowledge. She states: 'Teaching is essentially a rhetorical activity, seeking to persuade students change the way they experience the world through an understanding of the insights of others. It has to create the environment that enables students to embrace the twin poles of experiential and formal knowledge' (p. 23).

## 2. Setting the scene

Founded in 1973, the University of Aveiro is one of the newest Portuguese Universities with a staff of more than 900 in 2006, including senior and junior members. The traditional model of teaching has been centred on the teacher delivering information through lectures. However, new technological innovations, the globalisation of our society and culture, and new lifestyles will bring a demand for a different type of education. The institution is engaged in exploring advantage of all the opportunities to improve the quality of more than 40 undergraduate and 130 postgraduate programs currently being offered and to widen the catalogue of choices of students through the promotion of ICT/Internet based programs. The role of the teacher as well as the student has been changing in the past years due to the new demands of the information society. Faculty can not only focus on the delivery of knowledge but know how that knowledge is acquired by students and the resources they use to make the information more accessible [4]. Burge [5] argues that to: 'teach constructively is to provide opportunities for complex information processing related to a learner's needs and knowledge of the world, design relevant and real world (authentic) tasks…' and its this process that we believe online learning environments can support.

In 1998 concerns regarding student success rates, namely among first-year students, was behind the decision to implement an Internet-based environment to improve the student working conditions, namely: i) to provide easier access to learning resources, and ii) to provide an effective channel for interaction among students and staff. For this purpose a pilot project was initiated. The pilot project included the deployment of a Learning Management System (LMS) (WebCT™ was the choice) to support 4 semester courses for first-year students from different science and engineering undergraduate programs. The programmes success has lead to a steady increase in use of LMS technology at Aveiro and at the present the University owns a Blackboard Academic Suite™, which includes a LMS and a Content Manager. More than 90 per cent of the 12.000 students and over than 80 per cent of more than 800 staff members use Internet based ICT to support their daily teaching and learning activities. Figure 1 shows the evolution of the total annual number of work areas available in the LMS platform of the University of Aveiro for the period 1998 up to 2005.

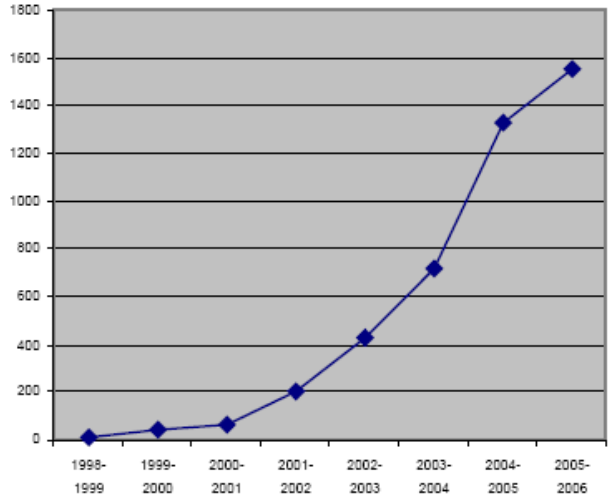


Figure 1: Evolution of the number of work areas in the LMS platform.

## 2. Advantages of on-line environments

Traditionally, instructors in teacher-centred classrooms have been expected to structure and control the flow of information to their students. There is an expectation that the teacher is all knowing and thus has all the answers. The use of on-line environments moves the ability to piece together knowledge into the hands of the students as the information is available in many different places and delivered in a wide variety of ways. Access to resources is just one aspect of changing the student' position from a recipient to a creator of knowledge as active and collaborative learning with peers, international experts as well as contact with the instructor changes the context of the learning environment. We have moved towards what Richardson [6] terms the process of learning rather than the product of learning.

Virtual learning environments (VLEs) have evolved greatly since their first adoption in the late 1990s when e-

learning in higher and further education was in its infancy. Primarily VLEs were tools based on models involving information transmission from teacher to student with little thought given to any of the activities that the learner may engage in. Today, the most effective are virtual environments with an integrated set of communication and support tools for the learner. They are spaces where learners can interact with each other, based on the constructivist principle accredited to Piaget [7] (1975) - that knowledge is actively constructed by the learner, not passively received from the environment.

## 3. Case study 1: the staff development program

### 3.1 Organisation

Three modules compose the staff development program offered at the University of Aveiro between 2005 and 2006. The first module covers the basic concepts and strategies relating to pedagogy and curriculum design in Higher Education. The second module provides an in-depth view of the power of Internet-based ICT in education, and addresses the most relevant issues concerning the current status of standardization and available products for the creation and management of learning solutions using Internet-based ICT. Finally, the third module addresses the practical issues related to building and managing distributed learning communities.

Each module of the staff development program runs for 2 months with 50-hour workload and is organised on a blended-learning approach, thus comprising face-to-face (f2f) and Internet supported distance activities. In each module there are three 1-day f2f moments. During the first days of this week some distance activities are proposed, namely a couple of ice breaking social activities and some initial readings. This first f2f activity is very important because it enables to build a common understanding of the learning outcomes to be achieved and of the work strategies to be used during the following weeks. It is, also, the moment for each person to get acquainted with the other participants and to understand the possible scientific, professional and personal bridges that may be interested to establish with each other, namely for the work to be carried out throughout the module. The second f2f session is held at the end of the fourth week, and is used to share the work that each group has developed after the first f2f meeting and to (re) organise the work for the last part of the module. Each module ends with the third f2f session comprising final presentations and discussions. The edition of an on-line portfolio of the reports highlights the work carried out throughout the module. This final activity is strongly recommended since it will stimulate the reuse and dissemination of the knowledge acquired by the participants.

### 3.2 Evaluation

The project main aims targeted the development of specific intervention strategies near academics to improve their knowledge on topics such as curriculum design or collaborative learning by using an ICT teaching-learning tool (Blackboard). Faculty members acknowledge this staff development program with a lot of interest, and all the available places (more than 150 for the three modules) were fulfilled. The courses are currently being run, and preliminary evaluation based on informal questionnaires and case studies developed by trainees show that the program helped academics develop their methodological and technological skills and, also, the perception about the adequate role of ICT as an enhancement factor to improve higher education teaching and learning practices.

The discussion forums were revealed to be a powerful instrument in the promotion of interaction between the academics. Topics were added weekly by the monitors.

The digital portfolios were a challenge to most of the academics. In order to help them maximise the use of this tool, the trainers asked for technical support. A member of the CEMED (Multimedia and Distance Learning Centre) team gave a brief description of the Blackboard digital portfolio functionalities.

### 3.3 Problems to overcome

One of the objectives of the three modules was to promote collaborative learning between the participants of the group using the on-line platform ‘Blackboard’. The collaborative work was not always easy to achieve.

There is still a strong traditional preference for f2f meetings. One of the main constraints to overcome is the change of mind required from faculty staff, most of which is not familiarized with the functionalities of ICT/Internet based technologies to deploy flexible and student-centred learning settings.

## 4. Case study 2: modeling best practice in the role of the on-line learner and teacher

On-line learning environments permit a full range of interactive methodologies, and on-line teachers can thus learn and reflect on a number of key aspects of instructional design while they revisit and in many cases adapt their courses to online synchronous or blended learning environments. The discipline “Strategies for Promoting Student Academic Success in Higher Education” has been promoting on-line activities since 2004. The discipline is organised in synchronous and asynchronous moments. This strategy implies a very well organised preparation. Before and during the delivery of the course we:

1. Organised the material required for the e-learning activity, namely the course contents, summaries, evaluation, bibliography, slides and documents.
2. Planned the timetable for the course. This includes the timing and duration of interactive sessions, dates/times when information will be delivered to students, timing of assessments, and deadlines for assessments.
3. Monitored the 'process' and ensured the timetable was adhered to.
4. Gave feedback to students through e-mail or in the chat of the blackboard.
5. Obtained feedback from the students on their experience so that we could reflect on the planning, delivery and management of the activity and make any appropriate adjustments for the next delivery.

### 4.1 Motivation

Learner commitment is an important consideration. Why are the learners undertaking the e-learning activity? Our experience indicates a reasonable personal commitment to the activity and a good assessment completion. The strategy used was to enrol students since the beginning in the e-learning tasks, explaining the penalties for missing the assignments. Also, at the first ftf moment the lecturer spent some time in introducing students to the virtual learning space. We believe that an effective induction session prior to use of a VLE is a key aspect of the success or failure of the initiative.

## 5. Conclusion

Technologies are tools to help build solutions. So is the case in education: technologies, namely Internet-based ICT, are tools to help build and deploy learning solutions. But technology is not the solution in and of itself. Technology can even be a problem if not properly used. For example, if not used as a way to achieve a required result, computers can become expensive gadgets.
However, our own and other's experience is providing evidence that the use of Internet based ICT promotes a set of benefits to students but also to teachers, providing means for enrich student-centred learning experiences. Kuh [8] argues that campus behaviours such as professor –student contact are hard to change and that collaborative and active learning requires real changes in campus cultures. Many arguments may be used to explain this effect, but a relevant one is that the use of Internet-based ICT may lead teacher to organize learning as a set of activities that will engage learners in pre-established tasks that require their own effort to be accomplished. This leads to a direct involvement of learners, improving the chances of meaningful learning experiences, thus resulting in the acquisition of new knowledge.

Indeed, teaching in on-line accessible and collaborative situations requires a variety of responses including changes in pedagogy as instructors taking the role of facilitators of information while guiding students toward solutions. In order for online learning to be successful, therefore, teachers as well as learners will need to explore new roles in the teaching-learning relationship

As technology advances, the role of on-line teacher as technician can be perceived as being less important. Certainly connecting to the internet and supporting infrastructure only gets better. Technology, however, also offers users the power to mould to our ideals and with open source software solutions as well as commercial e-learning environments allowing for more customisation, some technical knowledge is a good thing. Still, a fundamental aspect of the e-learning environment is the ability to work so these guidelines seek to serve an on-line teacher in running a class efficiently and effectively.

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