

Use of Information and Communication Technology in Higher Education and Lecturers' Competencies

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The use of ICT in Higher Education is considered a pre-requisite for adaptation to the European Higher Education Area. The new teaching methodologies aimed at more effective and appropriate learning for professional practice involve the use of audiovisual, computer and telematic tools on the part of lecturers. Research is currently being carried out at the University of Salamanca (financed by the Spanish Ministry) to find out what use lecturers make of these tools and the specific competencies that they have to acquire for making effective use of them. The data we present in this communication show a moderate development of educational activities mediated by ICT although lecturers are highly motivated.

Keywords use of ICT in Higher Education; training demands of the lecturers

1. Introduction

Social reality is changing very quickly, university studies must adapt to the international European context and technology development is facilitating new strategies of communication. All this is forcing Universities to change not only their degrees and studies programmes but also to renew some situations that until now seemed stable as teaching methodologies. Information and communication technologies (ICT) are becoming more and more important in the higher education process, claiming new spaces and conditions of learning, and new professional roles for lecturers.

The objective is not only to modernize higher education by introducing new and sophisticated teaching resources, but to assess the didactic possibilities of these resources in attaining the objectives sought. Pedagogical reflection about ICT should focus on how these resources can benefit students, what they represent in the curriculum, and what learning, competencies, attitudes, etc. they can foster in students, without losing sight of the kind of citizens and professionals that our present society demands. The most important thing in the use of ICT is the pedagogical method in which they are included. Thus, the knowledge, perceptions and attitudes that lecturers have in relation to digital resources is a determinant factor in their use in the educational process. To make this change successfully, it is necessary to satisfy the training demands of the lecturers. The work of Cabero, Castaño, Cebreiro and Gisbert [1], Cabero and colb. [2] y Zea and colb. [3] presents some data about these demands.

An analysis of the integration of ICT in higher education involves the consideration of at least three important dimensions of innovation that have repercussions on university institutional culture and the professional development of lecturers:

- changes in the educational objectives and in the conception of the teaching and learning process
- changes in students' and lecturers' roles
- changes in university organization

The two initial questions that we have to establish because they are basic to the use of ICT by lecturers are: what teaching and learning objectives should today's university foster? and what do we understand by learning, how is it produced and how can we facilitate it through teaching? The answers to these questions have changed in recent years. University students nowadays have more information than they can

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assimilate and much of their information is fragmented, so one objective of higher education could be to give them the cognitive tools they need to interpret this information and to think about the attitudes and values that it transmits. Students have to learn to analyse information and extract their own conclusions. This change in the objective involves moving away from the traditional form of teaching in which students were passive and only had to remember information. Now it is more important to carry out activities directed towards “teaching to think” or “learning to learn”.

The integration of technology resources in teaching practice from this perspective can help to foment an active and participative teaching. The main role of lecturers will not be to transmit information and culture but rather to act as experts and leaders, motivating learning. In this sense, lecturers have to be ready to make use of the possibilities that ICT offer, such as different learning contexts, focused on the students, presenting them with several types of interaction, offering different degrees of control of their own learning, adapting to their personal interests, promoting collaborative tasks and developing autonomy in their work and study (García-Valcárcel [4], Area [5]).

2. Research Objectives

The research that we are carrying out called “Integration of ICT as University Teaching Tools in the Context of European Education” (subsidized by the Spanish Education Ministry, Programme I+D+I 2005) has among its objectives to learn how ICT are used in teaching practice and what lecturers’ training needs are. We thus designed an on-line questionnaire that we applied to the whole population of lecturers at the University of Salamanca. We present the data obtained in this communication.

3. Research Results

3.1 Characteristics of the Sample

The sample of lecturers participating in the study includes lecturers from the areas of Arts and Humanities, and the Experimental, Biomedical and Social Sciences. Most of them are tenured lecturers (67%) with more than 10 years of experience (75%) and the distribution according to gender is balanced (54% men).

3.2 Use of ICT in Teaching

The activities carried out by the lecturers that involve the use of ICT with educational purposes can be classified into three categories (we keep the numbers of the items as they are identified in Figure 1, ordered from greater to smaller):

Consolidated activities (carried out by more than 65% of the lecturers)

1. Internet is used to look for information and resources to prepare the classes
2. They recommend certain Internet sites to their students (websites, electronic magazines, dictionaries, search engines...) selected for their didactic value for the study of the subject.
6. They use some Internet tools to communicate with their students (e-mail, routing slips, forums, Chat, videoconferencing...)
3. They draw up and use presentations (Power Point...) to explain topics in their classes.

Activities gradually being implemented (carried out by between 35 and 65% of the lecturers)

- 7a. They require their students to use ICT in activities related to their subject: search for information to solve problems
- 7b. They require their students to use ICT in activities related to their subject: the study of a topic

- 4. They teach their students to use specific computer programs in their professional field
- 7c. They require their students to use ICT in activities related to their subject: publication of information on the Internet.

Uncommon activities (carried out by less than 35% of the lecturers)

- 11. They design multimedia material (integrating text, image, audio...) to be used by the students
- 12. They collaborate with other lecturers of their specialty by means of ICT to prepare activities and learning resources
- 5. They use their own website to support their face to face classes.
- 9. They use ICT to follow the students' learning through online tutorship.
- 10. They use some kind of virtual platform to carry out activities that are complementary to the face to face ones with the students
- 8. They propose collaborative working strategies to their students mediated by ICT (online collaborative projects developed by student groups)

We should highlight the fact that for the lecturers who do not carry out these activities it is not because they do not find them interesting, since most expressed that they would like to do them (see Figure 1). This leads us to think that with the appropriate training strategy and some type of institutional incentive, this situation could change in the near future.

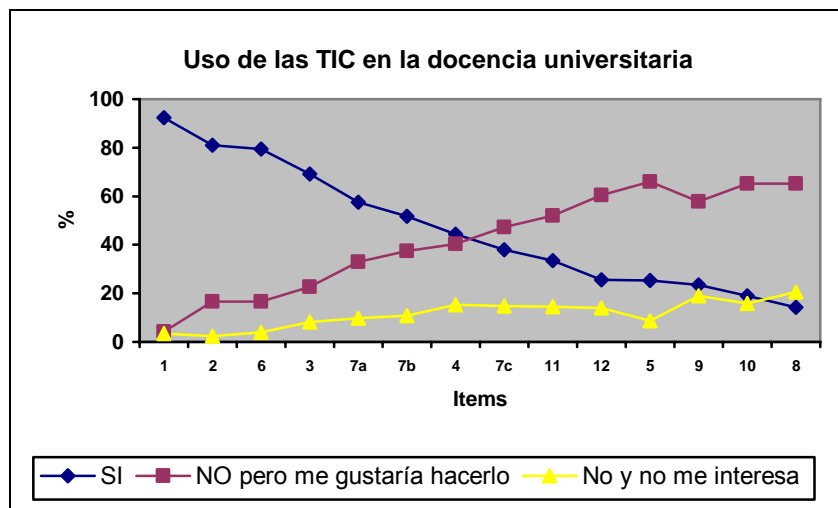


Fig. 1. Use of ICT in University Teaching

3.3 Teaching Competencies Related to the Use of ICT

In the lecturers' opinion, **the most important competencies** that they should acquire and make use of regarding ICT would be the following (we keep the numbers assigned to the items and they are shown in order):

- 1. To know how to use the Internet to look for information and resources in the preparation of classes.
- 2. To know websites (portals, web pages, electronic magazines, dictionaries, search engines...) related to their specialty.
- 6. To know how to use the main tools of the Internet to communicate (e-mail, routing slips, forums...)
- 4. To know how to use specific computer programmes in their professional field.

However, they do not undervalue other competencies posed for their assessment such as (just as you can see in Figure 2):

3. To elaborate and to use presentations (Power Point...) to explain topics in class.
7. To guide the students in the use of ICT.
8. To know collaborative working strategies mediated by ICT.
5. To design a personal website to support their face to face classes.
10. To know how to use a virtual platform to design activities that are complementary to the face to face ones.
11. To design multimedia resources (integrating text, image, audio...) for their didactic use.
12. To collaborate with other teachers in their specialty through ICT with educational purposes.
9. To design online tutorships to follow students' learning

This last one is considered the least important competency, thus showing the reluctance of many lecturers to do on-line work. This is in the understanding that we are in a teaching institution with face to face classes, where the students are offered tutoring hours that they rarely take advantage of, although it must be said that these tutorships are not designed as times and spaces to follow students' learning.

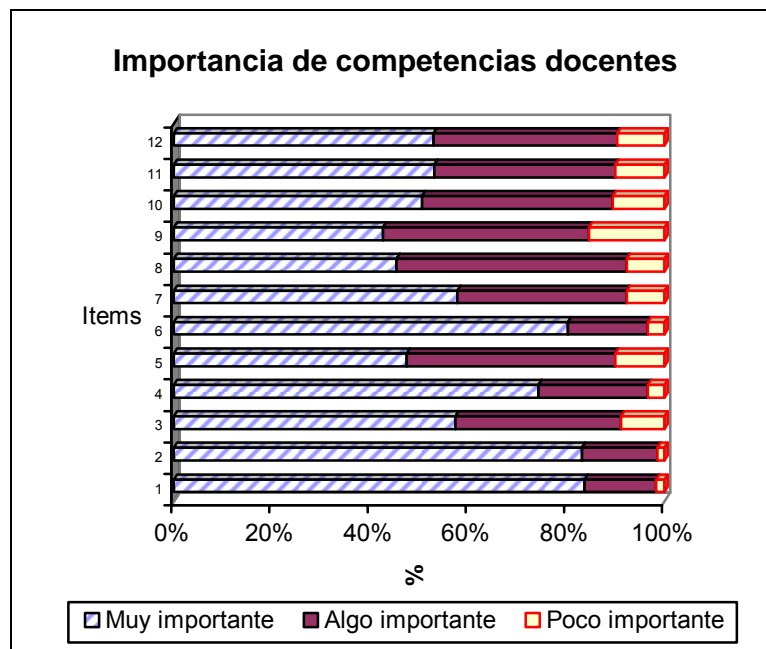


Fig. 2. Importance Assigned to the Teaching Competencies Related to ICT

3.4 Comparison of the Data by Areas, Professional Category, Years of Educational Experience and Gender Formatting of literature citations

Regarding the areas: in the Humanities, websites for the study of the subject are recommended to the students more than in other areas. In the Experimental Sciences, lecturers use more specific computer programs of their professional field and more multimedia resources are designed for students' use. In Social Studies they use more virtual platforms to carry out complementary activities. Lecturers in the Biomedical Sciences consider collaboration with other colleagues in their specialty through ICT more important.

Regarding the professional category: hired part-time lecturers give more importance than the rest to the orientation of the students in the use of ICT but less to the design of an educational web or the use of presentations in class.

Regarding the years of educational experience: the lecturers with less experience use the educational web more and those that have between 10 and 20 years of experience consider the on-line design of tutorships for following students' learning more important.

Regarding gender: Male lecturers teach their students the use of specific computer programs more, they make greater use of educational webs and they design multimedia resources more than their female colleagues. The women grant greater importance to most of the educational competencies in the use of ICT than their male colleagues.

4. Conclusion

University lecturers are in the process of integrating technological tools in their teaching practice, in which we already observe widespread use of Internet as a form of access to information and communication with the students. However, many lecturers still need to attain the necessary competencies in order to transform the learning processes, by making better use of the possibilities that ICT offer us to design new instructive resources, to better follow students' learning and to develop on-line activities through platforms that complement face to face activities, thus encouraging autonomous and collaborative learning. These competencies are considered by most lecturers to be extremely important.

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