Teaching Skills in Virtual and Blended Learning Environments

Competencias en los procesos de ense-ñanza-aprendizaje virtual y semipresencial

ABSTRACT

Universities are currently immersed in what is known as the process of European convergence to create the European Higher Education Area (EHEA). The aim is to establish a standardized, compatible and flexible European university system that enables graduates and undergraduates to move easily from one institution to another within Europe. As a result of evaluation mechanisms, the system will be transparent and of high quality, which will make it attractive and competitive internationally in a globalized world. In this paper, we focus on two distance learning modes that will become more important as a result of this change in universities: e-learning and b-learning. These basically involve the virtualization of learning processes through the use of computer equipment. We carried out a qualitative study using the case study method. The results indicate that teaching staff use information and communication technology (ICT) to improve student learning. Similarly, a high percentage (78%) of lecturers use some form of digital platform as a support for teaching. In conclusion, training policies should strengthen university teachers' skills in the use of ICT equipment, tools and resources related to blended and virtual learning.

RESUMEN

Actualmente las universidades están inmersas en lo que se conoce como el proceso de «convergencia europea» y que llevará al Espacio Europeo de Educación Superior (EEES). El objetivo es dotar a Europa de un sistema universitario homogéneo, compatible y flexible que permita a los estudiantes y titulados universitarios europeos una mayor movilidad, así como ofrecer al sistema universitario europeo unos niveles de transparencia y calidad, mediante sistemas de evaluación, que le hagan atractivo y competitivo en el ámbito internacional dentro del actual proceso de globalización. En este artículo, interesa centrar la reflexión en dos de las modalidades de la educación a distancia que asumirán importancia en ese cambio universitario: el e-learning y el b-learning, que consisten básicamente en la virtualización de los procesos de aprendizaje a través del uso de equipos informáticos. Para ello se ha realizado una investigación cualitativa con metodología de estudio de casos. De entre los resultados se destaca el uso de las TIC por parte del profesorado para conseguir un mejor aprendizaje en los estudiantes, de igual forma un porcentaje importante de los profesores 78% utiliza alguna plataforma virtual como apoyo a la docencia. Como conclusión se resalta que las políticas de formación deberían fortalecer las competencias del profesorado universitario en el uso de dispositivos telemáticos, recursos e instrumentos relacionados con el aprendizaje semipresencial y virtual.

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1. Introduction

The Bologna Declaration is the result of work undertaken by the educational authorities of 29 European countries in 1999, in order to establish a European Higher Education Area (EHEA). Currently, European universities are immersed in what is known as the process of European convergence (Fernández, Rodeiro & Ruzo, 2006; Díaz, Santollala & González, 2010).

The proposed new university structure involves students carrying out various face-to-face, blended learning and distance learning activities. The distance education modes of e-learning and b-learning are of particular interest, as they basically entail the virtualization of learning processes through the use of ICT equipment. This leads to a new form of teaching, for which university teaching staff need to develop new skills (Cabero & Aguaded, 2003; Outi, 2010).

Virtualization of the learning process through the use of IT equipment is one of the practices that have become most popular as a result of the Internet (Uceda & Senén, 2010). The Internet is an open, flexible and technologically accessible means of dissemination and communication. It is also a powerful tool for breaking the limitations of time and space that exist in traditional forms of teaching-learning (Álvarez, 2005; Cabero, 2006; Tejedor, García & Prada, 2009).

The European Credit Transfer System (ECTS) is a key aspect of the European Higher Education Area (EHEA). The introduction of these credits is a great challenge for universities (Font, 2003; Cebreiro & Fernández, 2003). Another challenge is that of introducing information and communication technology (ICT) as a means of boosting student learning (Salinas, 2004; Gutiérrez, 2003).

The project «University teachers' skills for promoting significant student learning through e-learning and b-learning in the framework of the European Higher Education Area» involved two main areas of activity. The first consisted of a literature review of papers on distance learning and on the teaching skills required for this mode of education. This activity enabled us to gauge which topics were of interest and, above all, to contextualize them. The second area involved consulting experts at various Spanish universities. The resulting reports provided interesting basic information on the general characteristics of education in b- and e-learning modes. This research helped us to redefine the scope of our initial proposals, the type of information that we aimed to obtain and the topics that were of interest to university

teachers. It also helped us to establish which data gathering techniques would be the most suitable.

Therefore, these two activities enabled us to establish the scope of the study and its general outline. The experts' experience helped us to determine the initial considerations and questions that would be addressed, and to define the general characteristics of the study and the term «skill».

It is difficult to take one concept as a reference when we define the term «skill». The existing definitions are so varied and appropriate that referring to just one of them would prevent us from fully tackling the subject in all its complexity. This is therefore a polysemous concept, which could lead to many definitions.

The literature on this topic (Perrenoud, 2004; Le Boterf, 1998; Aubert, 2003; González & Wagenaar, 2003; Cano 2007) considers various meanings of the term «skill». In summary, the following aspects are of interest: the concept includes knowledge, know-how and knowing how to be; it is related to action, which is needed to develop it and keep it up to date; it is linked to a context, to a given situation; it helps to effectively resolve familiar and unfamiliar work situations; and it can be taught. This study is focused on IT skills or «digital competence», which, according to the EC, involves «the confident and critical use of information society technology… It is underpinned by basic skills in ICT and the use of computers to retrieve, assess, store, produce, present and exchange information and to communicate and participate in collaborative networks via the Internet» (Commission of the European Communities, 2005: 18).

E-learning plays an essential role in educational processes. There are various ways to work with the contents: through the Internet, video recordings, satellite broadcasts, interactive television, virtual classrooms and digital collaboration, among others (Bersin, 2004). Some of its characteristics are as follows: it involves working in a network and can be updated instantly; information can be stored, retrieved and distributed and data can be shared; it is delivered to the end user through the use of computers and standard Internet technology; and it approaches learning from a broader perspective that goes beyond traditional models.

Recent studies stress that university teachers must have a command of IT skills and know how to develop them, in order to foster independent, meaningful learning processes. Therefore, lecturers should also know, understand, select, use, assess, perfect, recreate or create teaching strategies that are

effective in a context that is defined by ICT against the backdrop of ECTS (Area, 2006; Ruzo & Rodeiro, 2006).

Taking into account the above and the requirements of the EHEA, our aim was to study which teaching skills are needed to boost meaningful student learning at university level through e-learning and b-learning. The efforts of university teaching staff in this early part of the twenty-first century should be focused on this area.

2. Material and methods

The main aim of this research was to describe, analyse and explain teaching skills through a multiple case study. We focused on the following specific objectives:

• To propose a set of teaching skills that promote meaningful student learning through e-learning and b-learning.

• To identify Spanish university teachers' needs for training and refresher courses on the new concept of teaching, the establishment of European credits and the development of significant learning through e-learning and b-learning modes.

• To propose guidelines university teaching staff training in the areas of e-learning and b-learning, in order to boost significant student learning in the framework of the new EHEA.

• To achieve these aims, we carried out a case study (Stake, 2005). We purposefully selected a group of Spanish universities (which were representative of the entire country) that were working on initiatives or pilot projects involving e-learning and b-learning modes in the framework of the EHEA. We used the procedure that Goetz and Le Compte (1988) called «criteria-based selection» and that McMillan and Schumacher (2007) referred to as «purposive sampling». This procedure consists in determining the characteristics of participants before the study has begun. The participating universities were the Autonomous University of Barcelona (UAB), the University of Alcalá de Henares (UAH), the University of Barcelona (UB), the University of Deusto (UD), the European University of Madrid (UEM), the University of Huelva (UHU), the University of the Balearic

Islands (UIB), the University of Santiago de Compostela (USC) and the University of Seville (US).

We selected a statistically significant sample of teachers who were participating in the afore-mentioned learning experiences and met some specific criteria. For example, we wished to find out more about the use of the e-learning and b-learning distance modes, through an analysis of varied experiences. Therefore, we selected a purposive sample with the maximum variation, which was composed of a range of individuals who had wide experience and sufficient knowledge of the topic (Glaser & Strauss, 1967).

In addition to the variability, we considered the context as it would help us to increase our understanding of the topic. Hence, to select the sample size, we decided to begin with lecturers from different faculties and areas of knowledge who used virtual

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platforms and others who did not use them. In addition, for the final sample, we considered different techniques and instruments: questionnaires, interviews and discussion groups.

According to the various instruments we used in the research process, the final sample was made up as follows:

• Each university administered 50 questionnaires to its teaching staff. The main selection criterion was use of the virtual platform: 25 lecturers who used the platform and 25 who did not. In addition, the lecturers were selected from different areas of knowledge, faculties and departments.

• Each university carried out 4 interviews. Two lecturers were selected who used the university's virtual platform, and two were chosen who did not use it. In addition, it was specified that the interviewees should not have completed the questionnaire.

The University of Barcelona (UB) coordinated

two discussion groups with 8 lecturers in each one. The criterion was the same as described above: lecturers who used the virtual platform and those who did not. In addition, it was specified that members of the discussion groups would not have completed the questionnaires or participated in the interviews.

In the selection of data gathering techniques, we considered whether they provided enough information to increase our understanding of the issue, whether they involved different approaches to the topic and whether enough time was devoted to each activity. We used the following procedure to meet our objectives:

We requested an assessment report from each of the participating universities to find out about and analyse some of the teaching initiatives carried out by the university teaching staff through e-learning and b-learning modes.

A questionnaire was administered to 50 lecturers to find out what support (IT platforms, resources, strategies, training, etc.) the universities provided for the teaching staff in relation to the use of ICT to promote learning in e-learning and b-learning modes.

Each university carried out two interviews with lecturers from different faculties who used the virtual campus and two lecturers who did not use it, to discover opinions on the teaching skills required to foster significant learning in the framework of the EHEA.

To identify, validate and triangulate information, two discussion groups were made up of lecturers that used the virtual campus. The aim was to compare the participants' opinions and to find out about their experience of the topics dealt with in the interviews and the questionnaires. This activity was carried out in the last stage of the project, so that we could find out more about topics that had come up several times during the study (Coffey & Atkinson, 2005).

3. Results

The results are divided into two sections. The first section deals with the questionnaires that were administered. The second section describes the results obtained in the interviews and discussion groups.

Regarding the first section, we found that a large percentage of the lecturers who completed the questionnaire (almost 78%) used a platform to support their teaching. This indicates that universities are disseminating information to promote the use of their platforms.

The main tools used by lecturers in their work were: email (80%), web pages and multimedia materials. Although teachers knew about various other tools, they did not know how to use them in their teaching, for example only 10% used WebQuests and 10% used wikis.

The lecturers considered that their university's technological support was good. They stressed that, just as the students had IT resources, they usually had computer rooms and WiFi areas in the university where they could access the Internet and the platforms used on their courses. Very few lecturers (close to 15%) had created their own digital material for the students. A comparison of the data showed that this may be due to the training that lecturers had received in the design of resources involving technology tools.

The lecturers stated that they did not promote ICT, such as the use of search engines, email, blogs, wikis and other tools, on their courses. Thirty percent of lecturers considered that they received little advice on the use of ICT in teaching. The results indicated that lecturers had little training on the application of these technologies.

Despite the fact that lecturers received good technological support, we found that it was insufficient when we considered the high number of lecturers who wish to use the virtual campus or virtual environments in their teaching. Many members of the teaching staff could consider that they were self-taught in the use of ICT.

The Moodle platform has helped to advance in the introduction of ICT into teaching and has enabled teaching staff to become the administrators of their environment, so that they can design and shape it according to their interests and needs. Moodle is a flexible tool that fosters collaborative work and could be a good tool in training processes.

A variety of ICT training courses had been taken by teaching staff. Lecturers with advanced knowledge of this area considered that the courses were insufficient. In addition, introductory ICT courses and courses on working in virtual environments (for example, WebCT and BSCW, among others) had been promoted, as well as other programs related to online teaching.

In terms of initiatives to apply ICTs to university teaching, lecturers were aware of these and considered that they were interesting from a methodological perspective. They mentioned, for example, the use of electronic portfolios and lecturers' blogs. It appeared to be necessary to work in small groups (or even in pairs) and to stress transferable skills. In all cases, it was stated that teaching staff needed to be motivated and that coordination between the lecturers

was essential, particularly with respect to joint planning and continuous evaluation, among other factors. The aim was to attain good coordination between different subjects and to ensure that institutions' teaching policies are consistent.

Like the teaching staff, students have sufficient IT resources, including, in most cases, computer rooms and WiFi spaces in the university. Therefore, they can access the Internet and the platforms used for their courses. They recognise that they use ICT to ask their classmates for help, for example for notes and class exercises. This is in agreement with the results of a study carried out on young people and social networks by the Pfizer Foundation (2009).

4. Discussion

An analysis of the results revealed that the predominant teaching-learning mode in most cases is blended learning, which combines face-to-face and distance activities. This type of learning has the advantages of both e-learning and face-to-faces classes, and makes the work of the teacher and the student more dynamic.

Lecturers who had experience in the b-learning mode recognized the importance of IT tools for carrying out their activities. In these cases, IT resources play an even more predominant role, as there are no «real» teaching relations (with physical presence). However, this does not mean that there is no communication, either through synchronous or asynchronous interaction.

The use of platforms or virtual campuses basically involves virtualization of the learning process through the application of IT equipment. This is an activity that lecturers already carried out before WebCT or, more recently, Moodle, were introduced. Such platforms facilitate student learning through the use of technological tools, the Internet and other factors. Activities can be carried out with no restrictions of timetables, times or distances. One notable aspect is the need to incorporate transferable skills into university education, mainly due to the importance of innovation and knowledge, the increasing use of virtual spaces, change in the organization and structure of work and, above all, the demand for flexibility in training and learning systems throughout life.

4.1. Some conclusions about teaching skills

The many contributions made in the empirical stage of the study, in the interviews, discussion groups and questionnaires, were extremely diverse and referred to very different levels of specification. In some cases, the participants referred to «macro» or broad skill area, whilst in other cases they listed professional activities or tasks that involve a specific skill area.

An analysis of the data enabled us to conclude that, in general, teaching in IT, virtual and e-learning contexts involves the following specific skills: knowledge and use of ICT tools; knowledge and use of planning and design techniques for virtual environments; and knowledge and use of teaching methods for e-learning and b-learning. Such skills are broken down into many different professional tasks or «micro-skills», as shown below.

4.2 Guidelines for training programs

The quality of university systems is now one of the main concerns of countries committed to advanced social policies. One of the most obvious aspects of quality, which has been highlighted in all international studies (Castañedo, 2003; Tejedor, García & Prada, 2009; Kearn & Frey, 2010), is that universities can learn from their own experiences and reflect on educational practices in order to improve them.

One aim of this study was to provide some guidelines for the training of university teaching staff, mainly in relation to the development of significant student learning through e-learning and b-learning modes in the framework of the EHEA. Existing collaborative networks between universities have played a crucial role in this process. To consolidate these networks, lecturers are needed who have sufficient training, initiative and ability to promote the analysis, discussion and creation of new alternatives in a context of academic teamwork and collaboration.

Therefore, we can see that a training model is a design for learning that involves various interpretations of the origin of knowledge about teaching practice and of how lecturers acquire and expand this knowledge (Imbernon, 2007). It is therefore a norm or a plan that can be used to guide the design of training programs. Consequently, the process of training university lecturers can take place in different ways, according to educational concepts and the role of the teacher as a facilitator of significant student learning.

The guidelines that we present include a series of items that could help to boost development and strengthen the abilities and skills of university teaching staff. These items include the following:

• Focus on training university teachers in the use and understanding of technologies, according to their level of ability with the tools, resources and contents used in the virtual campus.

• Boost teachers' abilities in designing teaching activities that foster significant student learning.

• Promote the use of technology, instruments and tools in class, team and individual activities.

• Increase teaching staff's ability to know when to use virtual tools and resources in class activities, presentations and tutorials and when not to use them.

Boost abilities so that students have the means to resolve problems, communicate, collaborate, experiment, think critically and express themselves creatively in such a way that they can evaluate their own progress and that of their classmates. As a result, we can see that training policies for university teachers must be closely related to student needs. Technology provides students with a set of tools and resources that make learning more interactive and significant, particularly when it takes place in a more dynamic environment.

A second factor is related to the organization of training and the methods that are used to carry out training processes. These characteristics are combined in different ways in each case, depending on: the participation method (individual or group), the degree to which the activity is planned (whether or not there is a project and a fixed plan, etc.), the roles of those involved and the interaction between them (organizers, experts, advisors and participants, among others), how much involvement is expected from participants and to what extent they operate independently, the dynamics and internal structure of the sessions and the special strategies that are used to carry them out, among other factors. Various training methods were identified in the study. They can be classified as: university studies (for example, postgraduate programs); courses (for specific needs); cooperative work among teaching staff (which has several names: peer training, reciprocal training,

Professional tasks or aspects of the skill	Skill areas		
	Knowledge and use of the required ICT tools	Knowledge and use of planning and design techniques in the virtual environment	Knowledge and use of teaching methods for e-learning and b-learning
Understand and use the platform and IT programs needed to teach their subjects	■	■	
Understand aspects needed for the design, maintenance and assessment of tools used in the virtual campus (forums, materials, files, etc.)	■		■
Command of the tools for communication with the students (use of forums, chat, email, video conferencing)	■		■
Page management	■	■	
Page management in conjunction with the students	■	■	
Promote interactive learning, group work and team work		■	■
Foster collaboration between students		■	■
Boost the social construction of knowledge		■	■
Develop critical abilities and learning through other classmates and lecturers			■
Understand and use databases, multimedia presentations and animations; post videos, activities and assessments	■	■	
Understand the elements and resources that are used to promote and carry out continuous assessment and to correct activities		■	■
Know how to use IT programs that support teaching	■		■
Command of word processors	■		
Know which programs make it easier to surf the net (search engines, databases, accessing resources, learning objects)	■		
Understand and use the platform's tools	■	■	
Design activities for teaching in e- and b-learning modes		■	■
Adapt programs, materials and activities to the individual and group needs		■	■
Adapt materials and use the most appropriate methods to attain the course objectives		■	■
Understand and use the latest IT programs and tools	■		■
Design activities that are in keeping with the campus		■	■
Draw up activities and contents that are easy for students to understand (technical requirements such as the design of materials, hyperlinks, instructions for use, use and benefits of the learning objects)		■	■
Plan, monitor and assess activities		■	■
Ensure the campus works correctly for the subject		■	■
Manage the campus correctly	■	■	
Meet students' needs (tutorials, guidelines)		■	■
Access other IT resources (blogs, groups)	■	■	■
Resolve students' doubts		■	■
Improve teaching strategies		■	■
Coordinate the modules and topics dealt with in the (virtual) class. Beginning and conclusions		■	■
Gain a command of the characteristics of virtual and blended learning		■	■
Promote and coordinate debates in the forums, rather than making them into virtual lectures		■	■
Promote communication between students, not just between the lecturer and the students		■	■
Activities to monitor students (statistics on access to the campus) in the case of b-learning		■	■
Share the leading role with students through moderation (of chat, forums, etc.)		■	■

Proposed aspects of skills involved in the use of ICT.

etc.); seminars and forums (preferably on current topics); conferences and meetings with high participation (update on teaching topics); workshops for reflection and study circles; and teaching advice in departments and schools.

On the basis of these suggestions, methods of training were described in the study in relation to face-to-face, blended and virtual modes. Some of the participants suggested that activities should be adapted to different levels of ability in the specific area. In addition, they proposed that training activities should be complementary and carried out at different times.

From the contributions of our participants, we have put together some proposals that could be taken into account when training activities are organized:

Participants suggested that seminars should allow reflection and have a predominantly theoretical and practical input, as the main objective is for teaching staff to be able to review topics that provide them with different perspectives or involve aspects that complement the theoretical basis described by those responsible for designing the training proposals.

As shown in the results, the virtual campus has created a space for exchanging information and communicating about training. University teaching staff with less experience can receive virtual support to consolidate the training that they receive face-to-face. This support is provided by those responsible for training or by colleagues.

Training should help to develop skills that enable university lecturers to:

• Work with the elements needed to design activities for the virtual campus.

• Gain a command of the function and purpose of ICT tools and resources (multimedia materials, publishing tools, «software»» for publications and web design tools) and to use them to help students to innovate and consolidate their learning.

• Create online material that contributes to deepening students' understanding of essential concepts and their application to real-life problems.

• Play a coordinating role in supporting innovation in classes and promoting collaborative learning with other colleagues.

• Constantly assess professional practice and reflect on it to make continuous improvements.

• Describe how collaborative learning can contribute to strengthening skills in the area of knowledge management, the analysis of online resources, the incorporation of knowledge into professional practice and quality assessment.

Training should also help to development

significant student learning as follows:

• Support students in the use of virtual campus tools and other IT resources, so that they develop the ability to search for, manage, analyse, incorporate and assess information.

• Help students to use ICT to develop skills in the areas of communication and collaboration.

• Promote the development of skills in the areas of reasoning, planning, reflective learning, knowledge creation and communication.

• Use virtual campus resources to participate in work communities and benefit as a group from the practices used in the campus.

• Contribute to the development of learning and the social interaction of students, so that they can understand the concepts, skills and essential processes described in the contents and use them to resolve real-life problems.

• Encourage students to describe, examine, assess and present examples of their own learning.

Support

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