

FOCUSING ON ICT IN THE EUROPEAN HIGHER EDUCATION AREA

The Bologna Process and its Implications in the Innovation of the Teaching-learning Process

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Abstract: The Bologna Process is one of the milestones of the European Union. All European countries are adapting their higher education degrees to this new paradigm that pursues a common professional with the same set of skills across all countries. Its aim is to generate one of the most competitive economies in the world based on knowledge and assuring its sustainability. On the other hand, ICT is one of the cornerstones of this type of economy; thus, it does make sense to consider it as a key factor in higher education. In this paper, we relate the Bologna Process to the usage of ICT in universities focusing on the case of Spain. In particular, we give a brief overview of the preliminary usage of Sakai in our University.

1 INTRODUCTION

The increasing usage of the Information and Communication Technologies (ICT) in the learning process and its application in the cognitive and metacognitive processes brings up the following question: how will the upcoming European Higher Education Area (EHEA) will effectively take advantage from ICT?

In 1999 there was a commitment of all European ministers of Education to improve the competitiveness of university education. It was formalized as EHEA; although it is broadly known as the “Bologna Process” (BP). BP is aimed to develop a set of common skills across all degrees. These skills must let students face the challenges of a global and competitive job market.

BP tries to unify the plethora of different educational programs into a single European University valid across all European countries. To do so, each course from every degree is measured in terms of European Credit Transfer System (ECTS) units. The main purpose of BP is that students will switch from a model relying on the reception of knowledge from the professor to a new one based on the development of skills.

BP leads to an innovation in the teaching process (contents and didactic methodology) and the learning

methodology (processes, skills and strategies). Professor will no longer be the exclusive knowledge holder and the students will not act as merely receivers of that knowledge. This new education paradigm implies that students must take the leading role in the learning process: they must state questions, generate new information and contribute to a general consensus in the activities to be accomplished.

Despite some European countries have set the length of each degree to 180 ECTS the length of each degree by some European countries, the Spanish authorities have set them to 240 ECTS (equivalent to a 4 year degree). The reason is twofold: it satisfies BP; and, it also merges with other University systems of great concern to Spain such as USA, South America, Asia, etc.

ICT are currently being used simply as another learning tool (Caeiro et al., 2004). However, the new University system demanded by BP requires that ICT changes its current use to a leading one since ICT provides an effective, flexible, accessible and attractive way of learning. The rest of the work is divided into the following sections: Section 2 is devoted to explain the state of art with regard to BP and the adoption of ICT in the teaching and learning process. Some preliminary results of a new ICT tool being used in our University are shown and discussed in Section 3. Fi-

nally, conclusions end the paper.

2 STATE OF THE ART

To fulfill the requirements that society asks for education and professional skills, the European Council proposed BP. It is founded in a strategy at three different levels (individual, social and academic). These three levels derived into three strategic goals that aim to a worldwide leading educational system: enhance the quality and efficiency of the educational system; ease the global access of individuals to the educational system; and, make the educational system worldwide accessible.

Actually, BP states this change from a passive learning model, where there is a knowledge holder and transmitter (professor) and a receiver (student), to a new one based on self skills acquisition. This represents both a challenge for higher education institutions and a chance for innovation and internationalization.

Some of the most sensitive factors regarding to students' performance are (Carnoy, 2004): (i) labor situation; (ii) dedication and motivation to their studies; (iii) scholarships; (iv) prerequisites to access in the University degree; (v) previous degrees; and, (vi) grades in the last semester. According to (Carnoy, 2004), the advent of ICT means an enormous potential of change in higher education institutions. Nevertheless, several analysts consider that the changes accomplished have been scarce compared to what expected. One of the factors that limit the usage of ICT in the teaching process of higher education is that they may imply changes and transformations at all levels in the didactic process (Salinas, 2004).

The literature, apart from introducing ICT tools and results, presents the steps needed for the ICT implementation process in education. Regarding to ICT usage, we can find a plethora of applications and tools that bring to professors and students the chance to interact and exchange tasks. One of these tools is SAKAI that has been used in higher education institutions such as: University of Michigan; Stanford University; and, the University of North Carolina at Chapel Hill. In (Bercovitz et al., 2009), it is shown that the results of this tool are quite satisfactory for: professors; students; and, administration staff. Finally, there has been an attempt to provide educational support from the cloud computing environment such as CourseCloud and CourseRank. They have been used and developed at Stanford as a course scheduler tool (Bercovitz et al., 2009; Koutrika et al., 2009). The variety of this kind of ICT tools grows at the same

speed as its usage by universities worldwide. These platforms (i) serve as an exchange tool of tasks, data and support; (ii) ease the relationship between professors and students as the information flow grows; and, (iii) enhance the learning process. The adoption of these new technologies is due to the need in industry and universities of a proper management of knowledge.

Training enterprise games is another useful and successful methodology used to train professionals (Badia and García, 2006). However, the increasing popularity of ICT has made them loose the influence in the Collaborative Project-Based Learning (CPBL) methodology. This didactic methodology organizes the teaching and learning process in such a way that the professor proposes the students one or several real-world cases. Students must then work cooperatively in groups to seek solutions to the cases. This way, an active collaborative learning takes place: students learn to learn and to apply the theory to practical situations. We can consider CPBL with the help of ICT as a modern and effective methodology, especially best suited for BP (Badia and García, 2006). In fact, there are several European universities whose syllabus of courses is entirely organized in terms of CPBL like the University of Aalborg in Denmark and the University of Maastricht in the Netherlands.

It is also worth mentioning that there are also some ICT tools developed by the industry that aim to manage the knowledge. (Salinas, 2004) states that the innovation teaching process based on ICT consists in revisiting current process and promoting innovative experiences in the teaching and learning process at higher education institutions. This process relies on the ICT as tools that improve teaching, interaction and content distribution.

According to (Carnoy, 2004) there will be no effective adoption of an ICT-based teaching and learning process until some requirements are fulfilled like the cost reduction of hardware and professor training. This will only occur when a new generation of professors, those educated in the context of ICT, enters into all range of educational institutions. To overcome this situation current professors should be introduced to ICT by special training programs so that they can become comfortable with the new technologies. Professor will then be able to cope with the adaption of their courses to the use of ICT inside the teaching and learning process.

We do not have to consider the new teaching and learning process in universities as an isolated island. We have to bear in mind that this is a continuous evolution from the very first steps of the education. For instance, it is necessary that the teaching and learn-

ing process at high schools is oriented to acquire the necessary skills for higher education studies (Belvis-Pons et al., 2009). Students come to University with enough theoretical knowledge but lack of skills such as: oral expression; the exposition and discussion; and, information searching and filtering. Hence, working on these transversal skills have a close relation with future success in the university.

In this work we want to test if the availability of ICT tools in educational institutions imply significant changes in the management of education, the organization of the work or the way students study. To do so we use data from our University (*Universidad Pública de Navarra*). As we have previously noted, our University is using since June 2009 an implementation of a SAKAI variant (<http://sakaiproject.org>) called *MiAulario* (<https://miaulario.unavarra.es>). As times goes by, we expect to have more data that will let us to perform a deep analysis of the results of this tool.

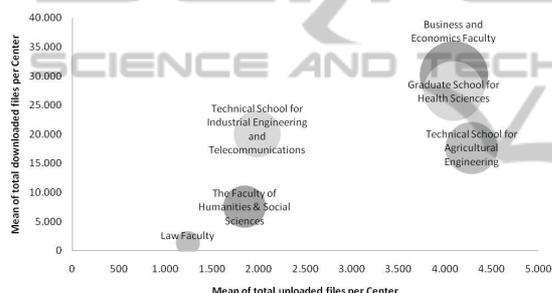


Figure 1: A general overview of the ICT tool (a variant of SAKAI) usage at our University.

3 RESULTS AND DISCUSSION

Figure 1 depicts the mean values of files uploaded and used in each one of the different centers we have (3 Faculties and 3 Schools); the data was provided by the institution. The size of the circle determines the mean of total accesses in each respective Faculty or School. From Figure 1 we can infer that each center uses this tool in a different way, depending on the usefulness perceived by professors. The Business and Economics Faculty presents the greatest amount of accesses (primarily because of a great number of downloaded files) that may be related to a greater number of downloaded files. On the contrary, the Law Faculty presents the lowest access figures (mainly due to the small number of downloaded files). The Graduate School for Health Sciences and the Technical School for Agricultural Engineering share a similar mean in terms of accesses; however, they differ in the mean number of downloaded files. The same can

be applied, though at a lower scale, to the Technical School for Industrial Engineering and Telecommunications and the Faculty of Humanities & Social Sciences.

With the exception of the Business and Economics Faculty, we can state that Technical Schools take more advantage of the ICT provided by our University than the rest of centers in our University. In spite of its recent adoption and implementation, we can assess, based on the same reasonings presented in (De Pablos-Pons and Villaciervos-Moreno, 2005), the four obstacles that possibly lead to the little usage of this ICT tool are: (i) the adoption of ICT is left to an individual choice instead of a global, corporate commitment; (ii) lack of knowledge; the majority of professors do not know the full potential of ICT; (iii) lack of resources and quality materials that ensures an ICT based teaching process; and, (iv) the necessity of the development of an evaluation tool to ensure the quality.

It is very popular in our University to photocopy the material displayed in class. This fact along with the general little motivation of students to search for information when compared to the traditional way of teaching can explain the scarce use of this tool.

We claim that the traditional way of teaching, where the professor is the knowledge owner and students are merely listeners, is no longer acceptable. BP seeks for an autonomous professional, committed and ready to live in a multicultural society with its own rules of coexistence. Only with professional of this kind, we will be able to develop a sustainable, competitive and dynamic economy. This will also bring an improvement in the quantity and quality of job offers along with a greater social cohesion.

Dealing with changes inside the universities in Spain, there is a merge of current three to five years degree into a single four year degree. This is one of BP keystones to satisfy the higher education degree compatibility across the European Union. It is not only the degree duration that changes but also the syllabus of courses. A syllabus is based on acquiring a certain set of skills by the future graduate student that will assure his capability to solve all the potential problems he will find in his professional life.

On the other hand, universities pay special attention to the research activity done by the faculty staff instead of paying attention to the quality of their teaching activities so as to improve the academic success of their students (Belvis-Pons et al., 2009). In the case of Spanish universities, they are less capable of performing changes and BP implies a pretty big change.

The innovation in terms of methodology imposed

by BP merely consists in a change in the teaching and learning process. Further, the change will only be effective if users (students and professors) see a significant value increment for themselves. Therefore, it must be taken into account the emotional and psychological effects apart from the social needs of individuals. The question that may rise up here is what does ICT have to do with the teaching process? It has been proved that improves the performance of students; it is a skill demanded by almost every company; and, it is a modern tool that is best suited for the characteristics of the Bologna Process. Besides, the OECD (OECD, 2001) considers that the integration of ICT in the teaching process spurs on to a radical change, the development of transversal skills and activities that fits better to real life activities than before. Following (Carnoy, 2004), this happens because most of professors do not know how to manage with new teaching tools or paradigms. It seems that, in general, they are not willing to adopt new technologies in education; in particular, ICT. This last assertion is also noted in (Carnoy, 2004; Salinas, 2004) where they claim that professors are not aware of means and methods needed to ease the teaching and learning process; i.e., they are not likely to change the traditional way of teaching. However, ICT usage is a mean to increase the performance of schools and universities. In concrete, we can find that ICT acts as a motivator and a generator of a better learning (OECD, 2001).

The usage of ICT in higher education will be favored if the government provides means, like the non-negligible investment in the ICT professors' training process and, mainly, if professors change the way they teach in order to use ICT tools to provide skills to students. The usefulness of ICT for teachers comes in hand with its complexity, dependability and cleanliness in the presentation of contents in the classroom. The main challenge that arises is that professors may leave their role as the source of all knowledge and take the leading role as a guide for students' self-knowledge acquisition. For this, an attractive and innovative methodology such as the effective usage of ICT tools is undeniable.

4 CONCLUSIONS

BP, being understood as a convergence plan, in an ambitious plan due to the importance and meaning of actions carried out to innovate the way the teaching and learning processes are done. European education convergence is planned as a single knowledge unit that permits its citizens to move and work around with a set of common skills. This fact constitutes one

of the strongest points to pursue this change and to adopt ICT as the main tool for its development. The adoption of ICT in higher education will depend on the joint effort of all people involved. The most notably role modification is on the professors' side as they will become guiders in the learning process.

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