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Blended learning in Higher Education: different needs, different profiles

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Abstract

The use of technology can be seen as an innovative challenge to restructure the teaching-learning process and integrate ICT in independent, collaborative and interactive work. The thoughts of 32 teachers and 36 students vis-à-vis a Course Management System from five undergraduate courses were analysed. A systematic content analysis was merged with a multivariate analysis. The results seem to reveal 4 profiles of teachers (i.e., activities-oriented, interaction-oriented, assessment-oriented, and collaboration-oriented) and 3 profiles of students (i.e., interactive learning environment-oriented, teachers' beliefs-oriented, training-oriented). A proficient LMS seems to require human resilience and versatile to the needs of all users.

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Keywords: ICT knowledge; distance education; online teaching-learning process; course management system; higher education

1. Introduction

In Higher Education, technology may be either used to re-enforce the prevailing practices, such as lectures, or it may be used to transform and disrupt those practices. Although, ICT has provided a potential for change, allowing the development of new approaches regarding teaching and learning there is still insufficient knowledge as to best practices in Higher Education Institutions (HEI), mainly concerning the use of online learning environments (e.g., LMS Moodle) and communication tools [1]. Several studies have pointed out the open source platform Moodle as an effective Learning Management System (LMS), able to be adapted to different needs and pedagogical contexts [2]. However, it seems important that the teaching-learning process

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supports concepts such as *produsage*, to underline certain skills and attitudes, including digital creativity, collaboration, communication and critical capacity [3]. In this context, this research intends to describe the main features of the Course Management System (implemented in LMS Moodle) from the point of view of the teachers and students of the undergraduate courses offered by a public higher education institution. The online component of these undergraduate courses has been implemented as an extension of the face-to-face component and aimed at overcoming time-space boundaries, and at meeting some of the teachers and students needs. The purposes of this paper are to assess teachers' and students' needs, to identify their profiles, enhancing the online learning-teaching quality process.

1.1. Course Management System

Technologies seems to allow students to learn more in less time - anytime and anywhere - and to permit the universities to centre on global learning environments when used appropriately. As Shackel [4] argues, it is important to evaluate some parameters that reflect the multidimensional usability nature of an LMS i.e., efficiency, learning, flexibility and the user's attitude. Regrettably, some usage profiles indicate that the LMS is mostly a tool set for information delivery and administrative helpfulness rather than a system with potential to develop teaching and learning activities [5]. According to Graf and List [2] as Internet communications tools progress quickly, Course Management System (CMS) developers should start to consider the enrichment of **system personalization, adaptability, and adaptation** i.e., giving students larger control over content and learning process. Nevertheless, LMS use for educational issues is not necessary correlated with student satisfaction [6]. The learning environment is favourable when teachers are organized and motivated [7]. In some studies, course content was the most important organizational issue in relation to student satisfaction as well as the importance of course websites to support conventional teaching [8-9]. According to Rudd et al. [10] the reorganization of the teaching-learning process (by teachers and students), through phenomena such as social networking, collaboration and connectivity, requires the establishment of complex roles in the process of learning and knowledge building. However, technology integration takes time and requires a **systemic engagement** [11].

2. Method

2.1. Participants

Teachers' and students' point of view of the five different undergraduate courses offered by this HEI were analysed. The current empirical study involved 32 teachers, being 50% female and 50% male, aged between 24 and 54-years-old ($M = 43.19$, $SD = 8.01$). Also involved 36 students, being 61% female and 39% male, with ages ranging from 18 to 48 years-old ($M = 22.05$, $SD = 5.44$).

2.2. Instruments: Semi-structured interview, data coding, multivariate analysis

Thus, a semi-structured face-to-face interview was conducted and validated. Data was collected in the first semester of 2010/2011 academic year and every interview was audio-recorded and verbatim transcribed. The collected data (from 68 face-to-face interviews) was analysed using the content analysis software MAXQDA (MAX Qualitative Data Analysis) to develop a coding and classification system. A Multiple Correspondence Analysis (MCA) using the variables considered in the interviews followed the descriptive analysis. Seven interviews were chosen randomly for the purpose of testing the coding reliability. In order to determine the reliabilities of the dimensions and to assess the internal consistency of the dimensions expressed in the

categories presented above, Cronbach's alpha was used. All Cronbach's alpha coefficients were higher than .7 (i.e., ranging from .78 to .96).

3. Results

Some (sub) categories emerged as the most important from the interviews' content analysis. The results of the MCA allowed clustering three different students' profiles and four different teachers' profiles regarding CMS use as presented below (see Figure 1).

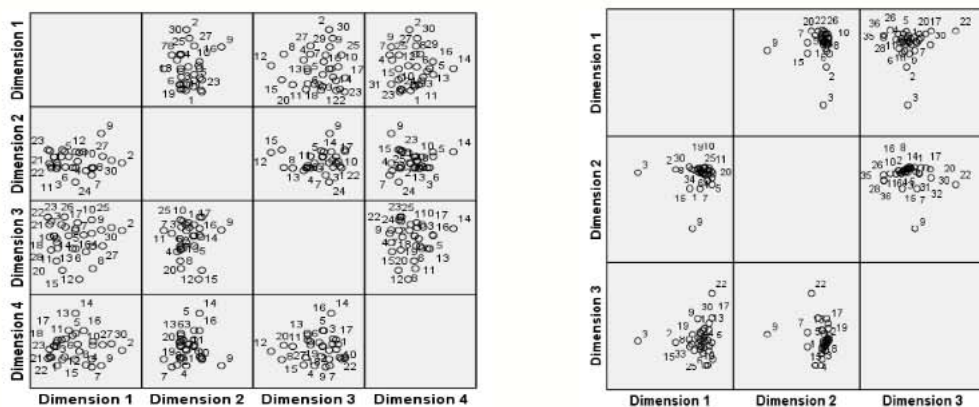


Fig. 1. The Biplot of objects and centroids of selected variables: graphical representation of Teachers (A); and of Students (B).

4. Dimensions of Teachers' Thoughts

4.1. Dimension 1: Activities

The first dimension explains the types of activities valued by teachers when using the LMS. Statistical results seem to confirm that there is a highly relationship between the use of different asynchronous tools (e.g., resources, link, glossary) the information content repository, and the teacher-student-content interaction ($eigenvalue=5.127$, $inertia=.394$). Indeed, the significant increase of philosophy FOSS (Free and Open Source Software) associated with the concept of asynchronous structured and collaborative activities have been under discussion by some authors [12]. The pedagogical use of asynchronous tools in a structured way seems to prove the advantage to incorporate collaborative online activities, since they are flexible tools, i.e. teachers can explore, adopt and adapt them for personal use [13]. In this sense, some studies have shown that FOSS applications, supported by a model-based interoperability, have facilitated the process of creating, editing, formatting (Web content), reuse and export learning content with SCORM standards (e.g., XHTML editor (eXe), <http://exelearning.org>) [14]. However, most teachers tend not to present Technological Content Knowledge (TCK) and Technological Pedagogical Knowledge (TPK) to enable them to build both their web pages and their collaborative e-activities [15]. Nevertheless, quality, ownership value, validity and reliability of open source software systems sometimes seem to turn out to be less transparent and even confusing for teachers [12]. In fact, most LMS appear to be poorly utilized in educational institutions, being primarily used to facilitate access to documents used in lectures and PowerPoint presentations i.e., as a common content repository [16]. One of the interviewees still reveals the following: "Simply responding to emails, sometimes it becomes a rather tiresome. Right now, I am also using some resources, forum postings and assignments.

However, I think that student assessment and the teaching process is not so easy to do in an online environment.” (Teacher26). The results also seem to suggest that this cluster of teachers believes that the LMS ecosystem is a privileged environment that can empowers the triangular relations of interaction student-teacher-content. In turn, the literature emphasizes that the increase of interaction between teachers and students, tends to allocate a more flexible and adaptable learning and allowing for more individualization of learning, accessible at anytime, anywhere [17-18].

4.2. Dimension 2: Interaction

The second dimension refers to the understanding that teachers have about the usage of several interactive tools in LMS. Considering the statistical results, it seems fair to state that there is a strong correlation with both use of distinct communication tools (e.g., blog, wiki, chat) and education level (i.e., LMS use has more advantages in Master’s or PhD courses compared to undergraduate courses) ($eigenvalue=4.573$, $inertia=.352$). Muirhead and Juwah [19] characterize the interaction dimension as a set of: i) abstract characteristics (e.g., facilitation of interpersonal communication) and ii) interaction types (e.g., learner-instructor interaction) in which communication can be establish synchronously or asynchronously. In this dimension, teachers seem to reveal some implicit knowledge from several synchronous and asynchronous tools. In this context, the authors add: “Among the import Web 2.0 features are social networking sites, video-and photo sharing sites, blogs, RSS feeds, tags, podcasts, wikis, and discussion forums. Knowledge transfer has become a two-way process, with users both receiving and contributing information. As a result, information has become a common and accessible commodity, circulated via interactive communities.” [20]. Some studies, for example, reinforced the prospect that teachers LMS use mostly a repository/delivery content and an administrative tool, and also being used moderately as a communication learning and interaction tool [5]. One of interviewees stated that: “I need more time to feel comfortable with interactive tools such as wikis, assignments, forums or a chat (...) because the use of technology is very time-consuming.” (Teacher3). Effectively, different levels of education (graduate or undergraduate) reveal different educational needs which differ from using online CMS. In this scenario, a recent study [21] showed a repository of teaching modules to embed an organized and differentiated database, attending to the genuine different needs of students, different curricula, as well as different levels of education.

4.3. Dimension 3: Assessment

The third dimension refers to the teachers’ understanding of how to assess students using a LMS. Statistical results suggest that there is a positive association with both use of work assignments and learning activities (e.g., inquiry, referendum, quiz) ($eigenvalue=4.457$, $inertia=.343$). The possibility of monitoring the students’ progress within a LMS was also looked upon as a key element in the process of co-construction of knowledge, once it helps teachers to provide students with formative feedback on their learning progress. In this context, an interviewee stated that: “I think that online resources, weekly assignments and different ways of using formative assessment tools promote the students’ motivation and engagement in the learning process.” (Teacher20). In order to strengthen the institutional commitment and interpersonal accountability of students in the teaching-learning process, some studies show that the development of a harmonious and effective online course seem to depend on feedback interventions and motivational strategies used (i.e., promoting a rich environment for active learning) [12]. Indeed, issues related to the pedagogical design, assessment activities, and feedback (interactive and formative) seem to be fundamental features that allow to validate (or to ensure) the online formative assessment in higher education [22]. Some authors also reinforce the importance of collaborative activities and strategies in the construction of knowledge, in other words: “Engaged learning is a collaborative process in which the teacher and student are partners in construction Knowledge and answering essential questions. This strategic approach includes setting goals, establishing timelines, and creating and

assessing authentic products.” [23]. Perhaps, both feedback-based evaluation and proactive community of practice, seem to prove being critical components for the effectiveness of teaching-learning process.

4.4. Dimension 4: Collaboration

The fourth dimension refers to the way teachers understand the creation of a collaborative community in a LMS. A positive relationship was also observed between the sharing information and online tasks (*eigenvalue*=3.555, *inertia*=.273). In this dimension, teachers are more concerned with the creation of social networks, as well as a privileged space to provide research and information sharing, collaborative learning and networking (e.g., discussion forums, debates). In turn, the concept of collaboration is based upon a set of interactions with various complexity levels – such as lesson structure, types of learning task [24], students’ and teachers’ beliefs, type of communication tools and, perhaps the stakeholder circle in an educational institution. In this sense, blended collaborative learning can assist students to feel more interactive and also exerts a positive influence in terms of motivation, behaviour and self-determination, as well as engagement in learning activities [25]. In this context, an interviewee reported that: “I believe that the main advantages in using Moodle platform are the possibility of re-designing pedagogical strategies, interdisciplinary collaboration and interactive network. But sometimes it was difficult for me to find the appropriate tools.” (Teacher30). The development of a community of practice (CoP), based on collaborative learning, can arise from meeting of minds i.e. when students within the clusters begin to discuss their solutions online [26]. More recently, some institutions have integrated in LMS Moodle other user-friendly systems (e.g., LAMS, <http://www.lamsintematiaoal.com/>) with particular potentialities in design (e.g., LAMS sequences) and management of collaborative learning activities [27]. Accordingly, this dimension seem to be more focused with real opportunities and creative approaches applying social media [28] in collaborative work i.e. how to use the features available in LMS Moodle in order to enhance social work research, networking or knowledge-sharing network.

5. Dimensions of Students’ Thoughts

5.1. Dimension 1: Interactive learning environments

The first dimension explains the type of learning community valued by students. Findings appear to suggest that there is a highly positive correlation between the use of several communication tools (e.g., email, chat), the benefits of interaction (e.g. content-teacher-student interaction), the self-regulation processes (e.g., self-regulated learning), and the accessibility of LMS Moodle (*eigenvalue*=10.510, *inertia*=.618). The interaction is considered as a determinant factor in online learning, once it may condition the success of the learning outcomes (or construction of knowledge) and the quality of online learning *per se* [29]. Some researchers demonstrated that the creation of a learner-centred LMS implies some interaction relationships associated with online learning i.e. learning-interface, learner-self, learner-content, and learner-learner [30]. In this perspective, the features of LMSs will allow a flexible and rich context (i.e. an adaptive ecosystem) that can integrate different interactive learning activities. Based on the students’ responses, the improvement of LMS interactivity may result in the students’ higher satisfaction, in other words: “I believe that some teachers are more comfortable using interactive tools such as wikis, assignments, forums or a chat than others (...) depends on the subjects, but we have more motivation and high-interest for interactive activities, I think that the learning process is, this way, easier and more attractive.” (Student17). For instance, social computing can be used to communicate and collaborate in several ways e.g., using various types of media in order to promote the students network and considering both knowledge construction and sociocultural perspective.

5.2. Dimension 2: Teachers' beliefs and subject matter

The second dimension identifies the importance of teachers' attitude in the LMS use. Based on statistical results, it seems reasonable to assume that there is a strong association with both the teachers' beliefs and subject matter e.g., cultural issues, computer self-efficacy beliefs, subject differences in the content areas ($eigenvalue=8.846$, $inertia=.520$). Even though increasing awareness of teachers about the value of training as to ICT use, relatively few teachers are prepared to incorporate ICT into their teaching activities [31]. In fact, external obstacles (e.g., access, training, local support) and internal obstacles (e.g., teacher beliefs, teacher self-efficacy, teacher attitudes) were defined as two obstacles that influence the teachers' ICT implementation efforts [32]. Moreover, (multi) cultural identities and thinking processes have also frequently been stressed as barriers to the integration of ICT in the education processes [33]. According to Simonson and Crawford [34] "cultural differences play a large role in how distance learners from different parts of the world interact with teaching and learning". In students' point of view, the differences in the teacher's behaviour (in LMS Moodle) was essential due to the teachers' personal beliefs/knowledge: "I think that some teachers are more familiar with the technology, and others just don't use the tools and resources that are available in the LMS, (...) they need to be more self-confident about using the LMS for teaching-learning activities" (Student32). There is also evidence that, the teachers with a strong sense of self-efficacy that are open to new ideas and new strategies have been also associated to teachers with an attitude toward efficacy on computer use in education [35]. Some studies have also shown that the disciplinary differences are import factors in design and development of online course [36]. Accordingly, distance learning in applied disciplines (e.g., Engineering, Nursing, Education) tends to be more diversified and more geared to a CoP compared to the pure online disciplines (e.g., Nature Sciences, Humanities, Social Sciences).

5.3. Dimension 3: Training

The third dimension identifies the relevance of training towards an efficient LMS use. In other words, results obtained from the present study also appear to indicate that there is a positive relationship between the lack of time (to explore the potential of LMS Moodle), the need to integrate other resources (e.g., interoperating systems), the students' technology training and the LMS usability ($eigenvalue=8.013$, $inertia=.471$). In fact, the new arena and the new challenges (in an era of globalization) perhaps deserve new models in the development of the teaching-learning process. Some studies have shown that the faculty members need more time to expand experience in technology-based instruction (e.g., e-moderation [37], integration of ICT [15]) with the purpose of improving their technological and methodological knowledge for their own and for their students. From the students' responses, it is obvious that lack of time to explore the potential of the LMS Moodle is still a relevant limitation. One of the students interviewed said that: "I need more time to explore several activities and useful tools of the Moodle platform, such as chats, wikis, and forums... or how to send assignments to the teacher! In some situations I don't know how to effectively use the platform tools and, for example, how to communicate with my colleagues" (Student11). Indeed, many interactive learning environments are a combination of multimedia with the hypertext, which incorporate *analogous or associative characteristics, accessibility, linkability, intuitiveness, and nonlinear organization* [38]. Thus, the integration of non-linear, multi-sensorial, and multimodal interactive systems, tends to offer strong potential to expand learning opportunities and strengthen underlying assumptions to individual construction of knowledge. Certainly, technology knowledge in online learning environments tends to be an emerging need, requiring "a new set of skills for most educators and learners" [34]. However, surprisingly, the results of a study conducted in 2005 by EDUCAUSE showed that more than 36% of students surveyed consider do not need additional training to ICT use in their courses [39]. In turn, Oh and Park [40] argued that lack of faculty motivation to integrate technology into their online courses is considered the most important challenge for the implementation of blended teaching.

6. Conclusion

In order to get relevant improvements in the teaching-learning process, it seems clear that the most innovative changes should embrace the e-teaching and e-assessment strategies, however, intervention at this level seems to require both the new organizational technological pedagogical effort and commitment. Although, there are also indicators that showed that users (teachers and students) were motivated to use the LMS Moodle and the online learning environment seems to be flexible and user-friendly. Our findings suggested important signs that reflect the emerging need of a new model in techno-pedagogical strategies, in order to develop technological, pedagogical and methodological teachers' e-skills and knowledge. In summary, distinct teachers' profiles (i.e., activities-oriented, interaction-oriented, assessment-oriented, and collaboration-oriented) and students' profiles (i.e., interactive learning environment-oriented, teachers' beliefs-oriented, training-oriented) were identified/discussed as emerging (relevant) issues, representing the sociocultural framing of educational thought and perhaps practices on online distance education. In terms of recognizing, understanding and responding to the academic community specific needs, this study can support an *inclusive, multi-dimensional* and *holistic* ICT knowledge for choosing adjustable teaching strategies. At the same time, the awareness of the strategies learning profiles enables teachers to choose more accurate teaching strategies to meet the students' specific requirements what could be of particular interest for students with special needs, and enhancing therefore both *student engagement* and *teacher efficacy/trust*. Unfortunately, in HEI is not easy to identify practices that respond to students' special needs. Consequently, it may be more advantages to identify learning and teaching profiles, so that strategies can be adjusted and personalized to potentiate the students' learning success. In this context, ICT use seems to provide ground to pedagogical practice truly flexible, versatile and plastic, ensuring (lifelong) learning and promoting the relatively harmonious, plural society.

6.1. Relevance and limitations

The present study has some limitations that must be considered when interpreting the results. The interview sample is not representative of the overall group of teachers and students at the university. This is a small-scale study, documenting an individual institution's effort, essentially concerned with ICT integration and learning opportunities. In addition, from the specific context of students with special needs a broader array of variables have to be analyzed in depth, such as: adaptable interfaces, evaluation of usability and student/teacher experience, multimodal interaction issues, technology use lifestyle and special educational needs, educational level differences in the teaching-learning process, and among others. Nevertheless, the study can contribute for new approaches on teaching and learning processes, of a particular sociocultural (eco) system, towards a more educated, collaborative and inclusive community of practice. In turn, this work also explore, at a deeper level, an interesting area especially for researchers concerned with the educational process in blended-learning systems, framing more flexible and innovative assumptions toward the effectiveness of online learning environments, in the context of higher education.

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