ACADEMIC PERFORMANCE IN CONSTRUCTIVIST LEARNING ENVIRONMENTS SUPPORTED BY LEARNING MANAGEMENT SYSTEMS

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Abstract

Institutions of Higher Education in Portugal face today unique challenges. Aware of the change, in general, these institutions have been presented reform initiatives, covering in their strategic plans new frames of operation, where e-learning and / or b-learning is recognized. The present study aims mainly to know the impact that b-learning and the implemention of some pedagogical models adapted to these environments, may have on academic performance of students in higher education. To this end, we analyzed the academic performance of students in a curricular unit of a course of Physical Education and Sport, for four academic years from 2007/2008, during which the unit was initially taught only presential, by 2010 / 2011, a period that was taught in a combined modality (75% online and 25% presential). Data analysis, referring to the classifications obtained, suggests that the creation of virtual environments, combined with complementary or presential learning, and using pedagogical models adapted to online environments (eg, *Comumunity of Inquiry Garrison et al,* 2000; *E-Moderating*, Salmon, 2000), diversified learning objects (scripto, audiovisual and multimedia) and strategies that encourage students, may indeed contribute to a significant improvement in their academic achievement. We also concluded that this b-learning modality, supported by online pedagogical constructivist and collaborative models allow effectively equate the teaching-learning process in a different way. However, the change should not be seen only from a technological standpoint, since the use of an *Learning Management System* is no guarantee of success, but must above all be seen in terms of changing attitudes and practices. This (new) reality implies a very large cultural change, as to rethink the roles of teacher and student, and the relationship between them, appropriate content, in addition to the implications that must be implemented in terms of structuring and planning of courses and curricula, evaluation systems and teaching and learning forms.

Keywords: Blended Learning; Pedagogical Models; Academic Results; Higher Education.

1 INTRODUCTION

Higher Education Institutions face today unique challenges in Portugal. Aware of the change, in general, these institutions have been present reform initiatives, covering in their strategic plans new frames of operation, where e-learning and/or b-learning is recognized. But in reality, few are still those that actually promote real alternatives based on Learning Management Systems (LMS).

Indeed, we have found, in different areas of our educational intervention, that in large part, these initiatives tend to replicate the existing policies so far, with examples of the use of new environments as a new environment or attractive factor, however, keeping the usual teaching practices.

The example of the implementation of the syllabus on paper or oral, to computer fields of virtual environments of online education illustrates this tendency to converge to the "traditional". Reflects also the fragmentation of knowledge, the restructuring of the teacher' role to distant tutor, often only present the work proposal without having given way to participate in its design and development of the underlying project.

The "platform" is sometimes used as information repositories where it offers educational material for students and completed tasks are received or online activities filled for comfort and illusory modernization.

Given this finding and assuming that combined learning of presential and virtual scenarios is an excellent strategy to face the challenges of information and knowledge society (Rosenberg, 2001;

Herrington, Reeves & Oliver, 2010) and the adoption of contemporary technologies in education provides a better understanding of the theories and activities in the teaching-learning process, it is essential that teachers of higher education will no longer be afraid to use new technologies and invest in their training at a time when technologies information and communication are one of the priority areas mentioned in the annual report on the European Information Society (Community European Commission, 2005).

However, there cannot be only teachers to recognize that their role has to be different. The institution itself must recognize that school no longer has a monopoly on the transmission of knowledge and no longer holds the image it had in the past, which gave it authority and respectability.

It must simultaneously invest in the social value of the teacher' image, although it is not the only holder of knowledge, continues to play a key role in educating students, not as passive beings, but as creative and critical citizens. In order to develop a democratic education for all, or at least for a majority, it is necessary that the institution understands that a large investment in equipment is not only sufficient as it can contribute to accentuate social inequalities.

It is in this context that we see e-learning becoming more widespread, with all the challenges that the use of this type of process involves (Masie, 2006). It is also in this perspective that we sought to develop our teaching practice in the teaching of courses in the social sciences and humanities area. Our exercise was thus trying to understand the impact that methods of teaching in blended learning with combination of different pedagogical models, promoters of a constructivist learning, interactional and collaborative, and different methods of teaching and learning strategies (Graham, 2006) may have on the academic performance of students in higher education.

To this end, we tried to study the teaching situation, investigating education while educating, involving us in our research practice, as authors and actors, since this praxis potentiates collaborative and contextualized dynamics, the on-going inquiry and reflection, the opportunity to examine our practice critically and systematically and, above all, because overcomes the usual dualism, theory and practice, that separates the researchers from the sample (Noffke & Someck, 2010)

It should be noted that the data presented in the next item are of a curricular unit (CU) entitled Historical and Contemporary Perspective of Physical Education and Sport (HCPPES) present in first Semester of Physical Education and Sport course, which came into operation in the academic year of 2007/08. In addition, the data will also be showing the modules of the first Semester in this course, in order to carry out a comparative analysis.

2 METHODOLOGY- IMPLEMENTATION OF THE DESIGN COURSE

One of our concerns from the 2008/09 school year, when we assumed the regency of the HCPPES CU, which was taught only in presential mode, has been trying to implement in blended learning, a pedagogical model based on collaborative, constructivist and interactionist learning nature. In this topic we present therefore the data for the work during the three years (2008/09 to 2010/11) of b-learning teaching, which has undergone adjustments according to changes in the combination of the two environments, in a design conception of learning, implementation and evaluation level.

In the CU design phase of learning we considered some principles that can be generalized to the design of any CU in an online environment (Garrison & Vaughan, 2008; Salmon, 2000; Jonassen, 1999), namely: (i) the design should focus on learning, being driven to achieve precise, achievable and measurable goals, (ii) should focus on meaningful performance or achievements, (iii) should assume that the results can be measured in a reliable and valid through the preparation of performance evaluation tools and (iv) must be empirical and self-correcting. In addition to these, there were also structural components we have created, such as the forums "news" and "doubts", the careful planning and explicit from the outset in "Teaching Guide Semester (TGS)" multimedia learning objects; video presentation, evaluation of the CU.

Teaching was shared between a teacher-conductor, responsible for the CU, and a teacher-tutor to supervise the students, mainly in interaction with the learning management system (LMS - Moodle).

First the Teaching Guide Semester (TGS) was designed which was functioning as the main reference of the student in relation to content, structure and activities. In its design we tried to establish a correct horizontal articulation among all its elements and a vertical articulation or intelligible sequence. It was mandatory that there was a clear description of aims and objectives of learning, defined in terms of expected accomplishments in the students and not focusing on content.

The TGS also included learning resources available (e.g. books, articles, videos, images, sites related to topics of study), the activities to be undertaken by students and evaluation criteria. Second, resources were made available in the LMS related to diverse topics addressed and mini exhibitions online (video and audio) in order to motivate them and create bonds between students and teachers (regent and tutor). Thirdly, there was a very big concern with the definition of tasks to be undertaken by students, or focus on the process activities and to solve problems which were learning experiences (individual and collective).

Fourth, the structuring element of the whole educational process: the dynamics of virtual classrooms (forums) via asynchronous communication. Considering this aspect in the whole process has been our concern to promote a constant interaction through three types of communication patterns: (i) student-content, (ii) student-teacher and (iii) student-student. Finally, and not necessarily in that order, selected theories and models congruent with the constructivist conceptions of learning that we advocate. Thus, we have privileged, by its timeliness, adaptability and relevance, the learning model for problem-solving structure called Multiple Perspectives for Learning Objects (MPLO) and models of Salmon (2000) and Randy Garrison, Terry Anderson and Walter Archer Garrison (2000).

3 RESULTS

At this point we present some comparative data of final grades from the initial operation of the CU in 2007/08, in presential mode until the academic year of 2010/11 in terms of blended learning, which can serve as indicators for future reflections. We also present the values of all units of first semester of the course to understand how these trends are converging or diverging results of the CU analysed.

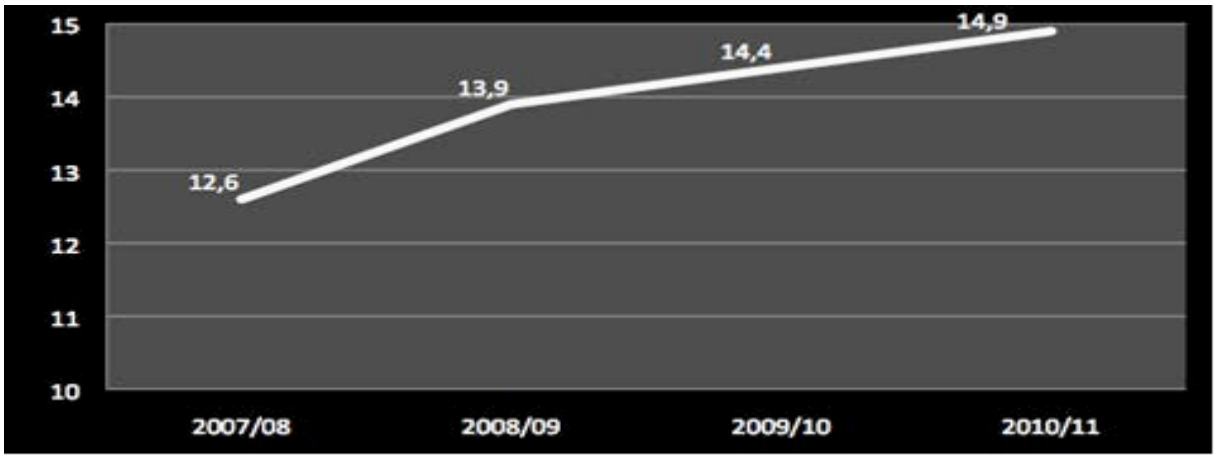

Figure I-Mean ratings obtained at HCPPES CU since 2007/08

Figure I presents the data for the 168 students enrolled in the Bachelor's Degree in Physical Education and Sport at HCPPES CU, since it began operating, with a total of 25 students in 2007/08, 36 in 2008 / 09, 47 in 2009/10 and 36 in 2010/11.

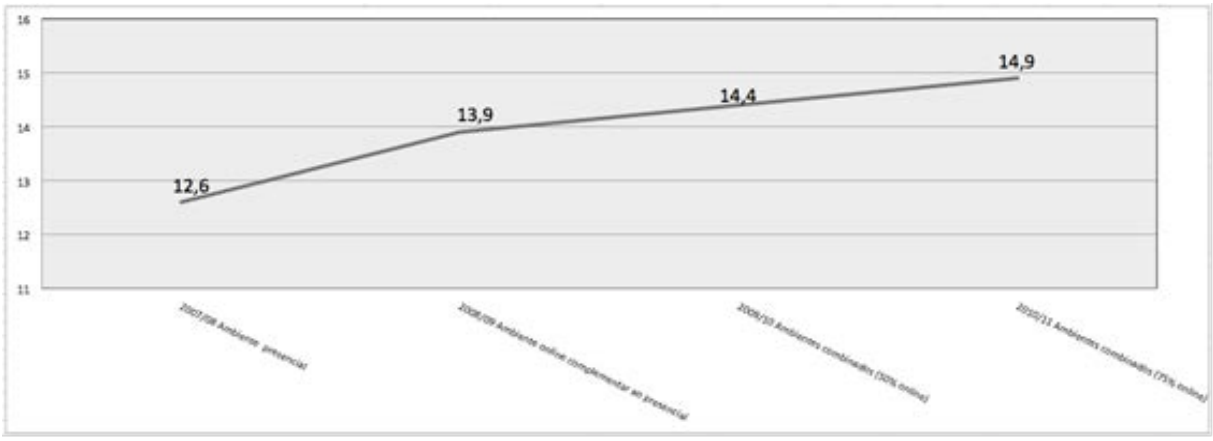

Figure II- Learning environments between 2007/08 and 2010/11

In turn, Figure II presents data on different combinations of type of education. Thus, we can see that in the first year, 2007/08, CU was only taught in classroom environment, was introduced in 2008/09 a virtual environment, but only as a supplement to presential sessions; the scenarios in 2009/10, presential and virtual came to be balanced (50% online and 50% presential), and in 2010/11 we used a b-learning methodology where the online environment focused non-attendance (75%).

For the analysis of the Figure I it can be seen that there is a clear improvement of academic results since the beginning of the course in 2007/08, from 12.6 to 14.9 values in 2010/11. We also verified that it seems to exist a relationship between academic performance and the increase of the online component, as if we analyse data from different academic years, we conclude that in all there is a gradual rise as the online component is growing.

Indeed, with the introduction of the virtual environment in 2008/09, only as a supplement to presential sessions, we found that the average ranking rose from 12.6, a value that normally corresponds to a satisfactory level of quality for 13.9 a value already considered qualitatively as good. Note that this virtual environment this year, supported by learning management system Moodle, was not limited to function as a repository of content, but worked mainly as an extension of the physical classroom, to the extent that students were "guests" on the one hand, to carry out activities to consolidate knowledge, exploring resources provided by teaching staff, and secondly, to extend the discussion of content in a virtual classroom, discussion forums, which worked in a asynchronous way and that allowed it to be created a virtual community of learning and practice.

In the following year, 2009/10, we abandoned the model of the virtual environment as complementary and we bet on the combination of two environments with a workload distributed evenly between the two scenarios. Given this distribution we did reformulations in the TGS, creating activities and e-activities that would make the two environments, presential and virtual complementary. It was our intention, therefore, to integrate these two spaces, and the underlying pedagogical models (presential and virtual) to make them subsidiaries and dependent on each other. The strategy seems to have been adequate, because the careful analysis of the evolution of the classifications shows us, again, up now to an average of 14.4 values. That is, comparing the average values for 2007/08 (only presential environment) and 2009/10 (combined environment) shows an increase of approximately 2.0 values.

Finally, in 2010/11, we decided to go a step further, focusing more on the online component (75% of contact time) and working in a more systematic way the model of research communities and e-moderation, and the results did not alter the trend, however, we found, once again, an improvement of ratings for an approximate value of 15.0, more precisely, 14.9, which corresponds to a 2.5 rise in values since 2007/08 , at the beginning of the UC-face environment.

Unidades Curriculares 1ºsemestre	Ano lectivo 2007/08		Ano lectivo 2008/09		Ano lectivo 2009/10		Ano lectivo 2010/11	
	Modalidade	Média	Modalidade	Média	Modalidade	Média	Modalidade	Média
PHCEFD	presencial	12,56	*b-learning*	13,92	*b-learning*	14,39	*b-learning*	14,93
AE	presencial	7,6	presencial	10,9	*b-learning*	12,4	*b-learning*	11,2
PDA	presencial	9,1	presencial	9,8	presencial	13,1	presencial	9,9
Anat I	presencial	9,4	presencial	10,7	presencial	12,5	presencial	10,1
PGOSE	presencial	13	presencial	15,2	presencial	13,8	*b-learning*	10,8
PEFD I	presencial	15,2	presencial	15	presencial	15,2	presencial	14,6

Table 1 - Means of the first Semester Curricular Units of Physical Education and Sport Course

As noted above, we examined also the results of students in all units of first semester, present in the syllabus of the course, and found some interesting data. Firstly, and according to the reading of Table 1, we found that the results of courses taught in a presential-only mode, such as Psychosociology Development: epigenesis and Life Cycles, anatomy and physiology I and Practice of Physical Education and Sport I do not have a similar trend to that of CU HCPPES. Except for the 2009-2010 academic year in which the results are higher, other years have very similar averages.

Take the example of ANAT-I with 9.4, 10.7 and 10.1 values, in 2007/08, 2008/09 and 2010/11, respectively. These results seem therefore to suggest that it was not the intrinsic characteristics of the class that led to the growing trend of the results of CU HCPPES. Secondly, we found that the results of courses Antropossociology-General and Developmental Education and Structure of Educational System-which were taught in a blended learning mode are also distinct from the results of the CU

HCPPES, this is because both classifications downloaded. For example, at UC PGOSE, the results came down sharply, from 13.8 to 10.8 values, in the year that the combined mode was introduced. Given these results, it becomes evident that the introduction of a form of b-learning, supported by a learning management system, in the educational process itself also is not synonymous with good academic results.

4 CONCLUSIONS

Among other aspects, this exercise confirms the national and international research already developed by other teachers and researchers in this area (Paiva et al 2004; Jones, 2006; Jung & Suzuki, 2006; Owston et al, 2006, Moreira & Monteiro, 2010).However, we feel that is enough to do and that many procedures have to be improved so that this paradigm of teaching-learning approaches the paradigm we want.

Comparing the data obtained on the evaluation of the CU in 2007/08, where the mode adopted was 100% face to face with the following years, in various forms of blended learning, we think that the explanation for the results, final evaluations more higher with the increase of online component, may lie not in more intensive use of an LMS, but the assumption of new roles for students at CU and we, as a teaching team, we were taking these modalities, making use online pedagogical models, strategies diverse and motivating resources and also to change the very nature of the assessment.

Indeed, this process, which had the use of a capital element LMS reshaped not only the role of students, allowing them to assume more the burden of their learning, but also our own role, as it sought to assume the duties of a (e)-moderator of a (e)-facilitator of a (e)-a counselor or (e)-motivator aiming to provide the "scaffolding" that supports student learning, accepting their autonomy and initiative, encouraging them to discuss with the teaching team and each other, encouraging them to problem solving and accountability. In turn, the evaluation sought to carry out these online environments during these years, was seen as a process of continuous and participatory nature. The e-activities that were promoting collaborative nature, where dialogue, debate the collective thought was a constant thought, allowed to gain social, emotional and cognitive consequences were obvious in the final evaluation.

Therefore we conclude that these modalities in blended learning, supported by constructivist pedagogical and collaborative online models currently allow to equate the teaching-learning process differently. However, the change should not be seen only from a technological standpoint, since the use of an LMS is no guarantee of success, as we have seen, but should mainly be seen in terms of change in mentality and practice.

This (new) reality implies a very large cultural change, as to rethink the roles of teacher and student, and the relationship between them, appropriate content, in addition to the implications that must be implemented in terms of structuring and planning of courses and curricula, evaluation systems and forms of teaching and learning.

It seems therefore that the current framework of knowledge society and information, based on new technologies, which addresses the continuing challenges of a rapidly changing society, online education is becoming increasingly important and central assuming is, increasingly, as a credible alternative to merely teaching presence. Thus, combining the best of these two complementary pedagogical "worlds", of these learning environments, presential and virtual, can be a major pedagogical challenges of this century.

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