An experience of teaching biology classification and evolution in e-learning environment

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Abstract. *This work describes the experience of teaching a university course "Biological Classification and Evolution", in an e-learning environment, over two years. The pedagogical model adopted by our university and the platform used is Moodle. The course was divided into several units, each with written texts, films of YouTube and a forum to discuss the contents. This experience gave very positive feedback.*

Keywords. e-learning, Teaching Methodology, Biology teaching

1. Introduction

e-learning presents a real challenge and sharing personal experiences is important in furthering the development of best practices [1].

This paper describes an experience of e-learning of Biological Classification and Evolution, a discipline (semester) that integrates a 3-year course in Environmental Sciences. This discipline (second year of the course - second semester) using e-learning methodology started in the academic year 2008-2009. Thus the experience described in this paper is from the last two academic years.

In 2008-2009 14 students were registered and in 2009-2010 41 students, though 5 subsequently dropped out. This study therefore involved 50 students.

The methodology used generally followed the pedagogical model adopted by Universidade Aberta [2]. This is based on e-learning and on the intensive use of new tools for on-line communication (the Moodle Platform).

2. Methodology
2.1. Discipline

The discipline has an item of news where teacher puts the news, but students are not allowed to post.

Help Forum has final explanation, doubts about access to contents and questions related to continuous assessment and final exam, but there doubts about subjects are not permitted.

The course is divided into the following units:

1 – Theories of evolution and basic principles of classification
2 – Domain Bacteria, Archae and Eucarya
3 – Plant classification
4 – Phylum Porifera, Cnidaria, Platyhellminthes, Rotifera and Nematoda
5 – Phylum Mollusca
6 – Phylum Annelida
7 – Phylum Arthropoda
8 – Phylum Echinodermata
9 – Phylum Hemichordata
10 – Phylum Chordata

An example of a unit can be seen in Figure 1.

Fig. 1 – Unit 8.

The students, at the end of the third week, must choose their assessment mode: final exam or continuous assessment. If the options are continuous assessment, students must produce two works as a small digital document, called e-folio A and e-folio B, that contribute 40 % of the final grade and a compulsory written test, face-to-face, at the end of the semester, called p-folio, which contributes 60% of final grade (it is necessary to obtain at least 50%). e-folio A and e-folio B consists of work of research about a subject or question/s assigned by the teacher. The students do the work and send it to teacher using the platform e-folio A is during 5th week, and e-folio B is during 12th week of the semester. The aim of these two e-folios is to assess the development of competences in subject teaching [3,4].

If students opt for a final exam, at the end of the semester there is an exam assessment, consisting of a 2 hours plus 30 minutes exam face-to-face. Their final grade is based on the results of that final exam.

The students can do face-to-face examinations in our centres, in several parts of the world, depending on their address/location.

2.2. Analyse data

To study the interaction of students, the days when those interaction occurred were analysed. The week was divided into working days (Monday to Friday afternoon) and weekend (Friday evening to Sunday inclusive).

To study period of day the hours of intervention were divided into morning (8 am to 13 pm), afternoon (13 pm to 19 pm), evening (19 pm to 22 pm) and night (22 pm to following 8 am).

3. Results

3.1. Assessment mode decision

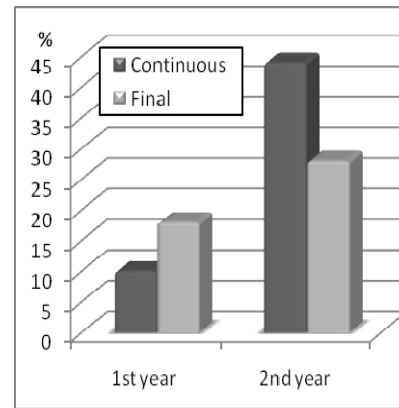The students chose their assessment mode. The results of this decision, in both academic years, can be seen in Fig. 2.

Fig. 2 – Percentage of students in continuous assessment and final exam, in both years

3.2. Help Forum

In this were 27 posts, 16 by students and 11 by teacher. The posts about problems with platform correspond to 41% and about evaluation corresponded to 59% of total.
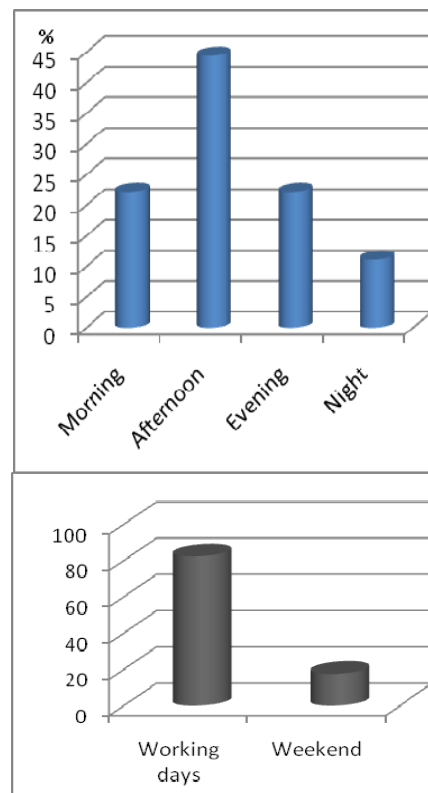
The period of interventions was represented in Fig. 3

Fig. 3 - The hours of posts in helping forum (above) and the days of these posts (below).

3.3. Subjects forum

In this forum was discussed the contents of the discipline and sometimes students put an image of an animal in order to get help in identifying.

In this forum students participated more at the beginning of the semester, when there are no e-folios to be done in all disciplines. After work on e-folios started, the activity in the forum decreased (Fig. 4).
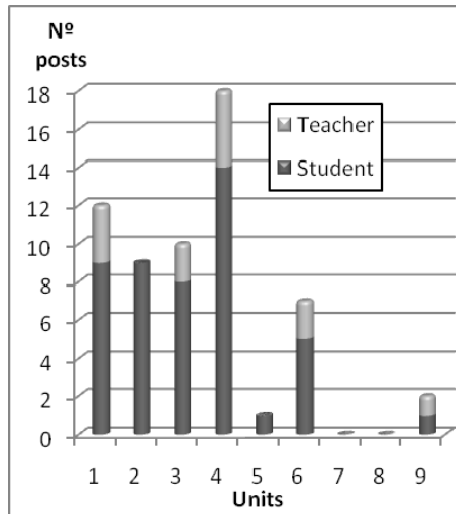

Fig. 4 – Number of posts, in each unit.

The numbers of participation were 67. Posts of students were 50 and of teacher were 17.

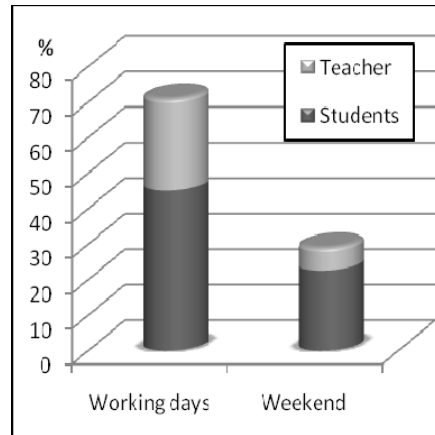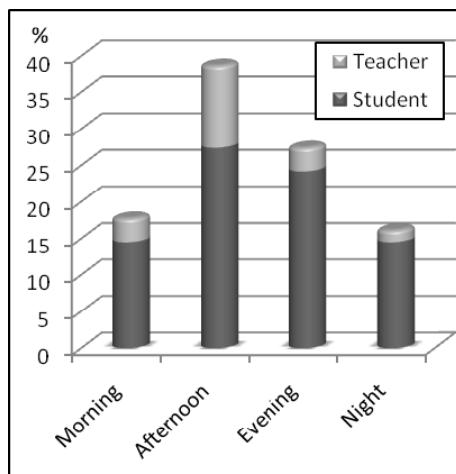The time of day and days of week that these posts were made can be seen in Figure 5.

Fig. 5 - The hours of posts in subject forum (above) and the days of these posts (below).

3.4. e-folios

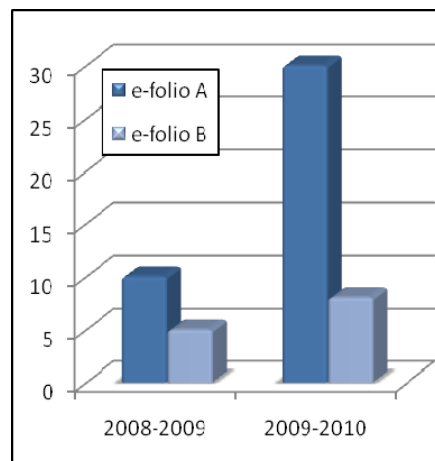The participation in e-folios forum can be seen in figure 6.

Fig. 6 – Number of participations, in forum of e-folio A and B, in each year.

This time of day and of the week these interactions occurred can be seen in Figure 6.
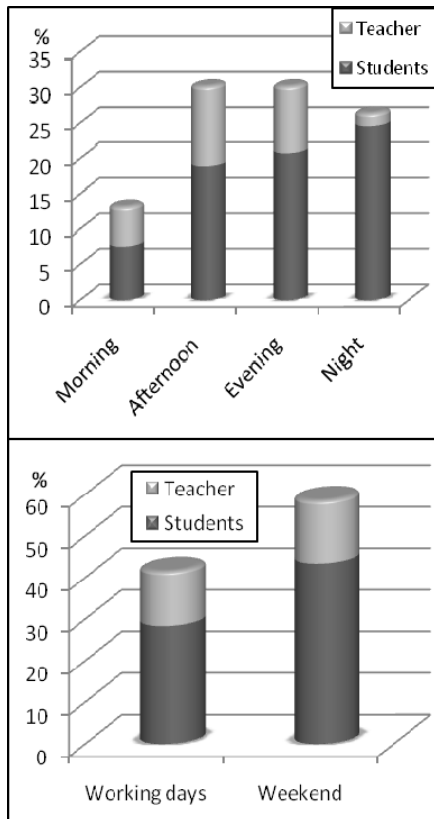
Fig. 7 - The hours of posts in e-folio's forum (above) and the days of these posts (below).
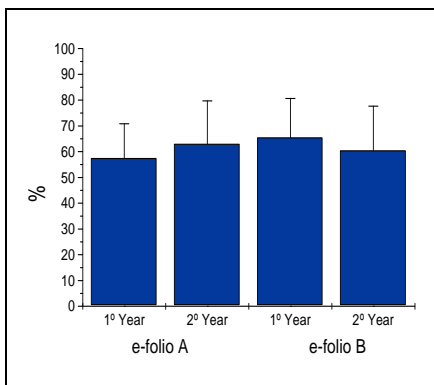
The grades obtain by students can be seen in figure 8.

Fig. 8 – Percentage obtain by students in e-folios in both years.

3.5. Revision forum

For students in all units, a final unit was created called Revisions where every day the teacher put two questions to be discussed by students. The students of the previous year asked to be given all the questions and to be given some days to start discussion. This suggestion was accepted.

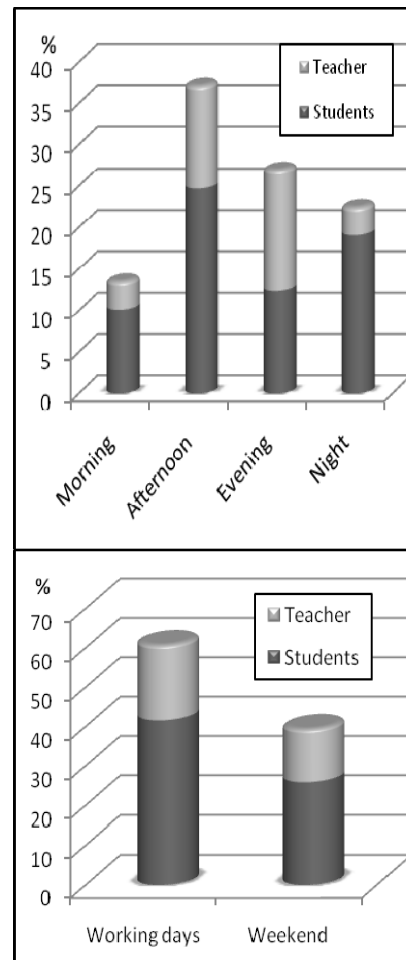This time of day and of the week that interactions occurred, in Revision forum, can be seen in Figure 9.

Fig. 9 - The hours of posts in revision forum (above) and the days of these posts (below).

The number of interventions in revision forum is higher than interventions in all subjects forum (Fig. 10).
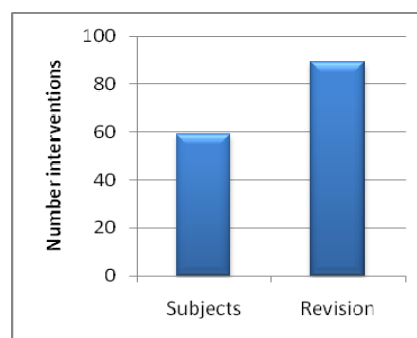

Fig.10 – Number of interventions in subjects forum and Revision forum.

4. Discussion and conclusions

In first year students chose preferentially assessment by final exam but in second year the opposite occurred. This was because of the advice given by 1st year students to the new students. In fact the competences of students in continuous assessment, in general, are better than the competences of students in final exam.

The e-folio work was carried out mainly in the evening and at the weekend. This was expected because our students work at their jobs during the day.

The participation during the weeks of subjects units were below our expectation, but the reason given by students was that they also had to work on e-folios of other disciplines.

The idea of creating a discussion unit at the end is not part of the pedagogical model of Universidade Aberta, but it was shown to be very important, as can be seen by student participation.

The problem of e-learning is that teacher has to read the forum everyday (if it's possible) and if necessary come in and respond to students, including weekends, which is very time-consuming.

The students' opinions about the skills acquired are very favorable, and this allows us to conclude that teaching this subject by e-learning and with methodology used is a good practice.

Acknowledgements

References

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