e/b-Learning Activities & High School Pedagogy

Rui Antunes

Abstract—This article presents the implementation of several different e/b-Learning collaborative activities, used to improve the students learning process in an high school Polytechnic Institution. A new learning model arises, based on a combination between face-to-face and distance leaning. Learning is now becoming centered with the development of collaborative activities, and its actors (teachers and students) have to be re-socialized to a new e/b-Learning paradigm. Measuring approaches are proposed for this model and results are presented, showing prospective correlation between students learning success and the use of online collaborative activities.

Keywords—e/b-Learning, Collaborative Learning, Teaching Communities, Web-based Courseware

I. Introduction

A few years ago all teaching activity was mainly focused on (just) transmitting information, rather than being centered on students and teaching activities. This turn out to increase unsatisfactory learning results, students absenteeism, and a know tendency to only concentrate study immediately before exams.

Many web-based learning techniques and tools are available today, taking Internet's full potential. Continuous transition to an online learning model must be, no doubt, the road ahead to follow, and it should be based on a blended model with the combination of using together face-to-face sessions and technology based materials.

II. Re-Socializing Teachers and Students

The new e/b-Leaning pedagogy is becoming fundamental for learning and for teaching success. This concept only makes sense if it is well structured, and if it makes possible to develop online collaborative activities [1], [2]. Also, we must define ways to evaluate the model and use new multimedia tolls that can allow us to enhance the interactivity between all the participants of the learning process.

Pedagogy re-socialization [3] is required for developing interaction, and to brake some barriers that still exist when new tools are available. In fact, students and teachers are now

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also online actors of the learning process. In a distance learning environment it is very important that teachers achieve the necessary train to deal with the new online learning tools, as teaching is now integrated with the demand for online activities.

III. Collaborative Learning Activities

The suggested pedagogy model mixes distance learning and collaborative work with online activities. These should be previously announced for the students (at classrooms or by distance), agreeing also precise deadlines for each activity. Group activities can be proposed to develop collaborative learning and students autonomy. The group activities must be well accomplished by teachers trough training sessions, to watch the students work evolution. Planning should be divided in small modules, for week periods, and all contents must also be available online.

High school pedagogy needs a strong experimental activity. This is crucial for Polytechnic Institutes, now adopting the use of remote and virtual Labs for teaching and experimental investigation.

A. Quiz Activities

Complementary to classroom activities, online activities are part and make an important role in a learning process. One of the popular online training tools for students are the quiz activities/online tests:
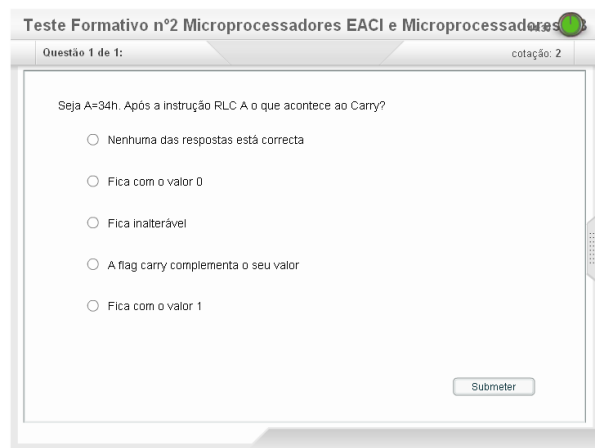

Fig. 1 "Multiple-choice" online quiz (*Articulate*)

Articulate [4] allows a teacher to develop online quizzes

that can be exported to any web page. These can be of type: "true/false", "multiple choice", "multiple response", "fill in the blank", "word bank", "matching drag and drop", "matching drop-down", "sequence drag and drop" and "sequence drop-down". Next figure shows a "fill in the blank type" quiz:

Fig. 2 "Fill in the blank" online quiz (*Articulate*)

Online quiz activities allows students to train and to be auto-graded, even at their homes. Several options are usually available, such as the possibility to receive feedback, to know which question is wrong, to change the maximum test time, the total number of questions, the awarded points and the question attempts, etc.

The questions are stored in a computer database, being frequently shuffled to prevent plagiarism at classroom exams. However one should remind that this tools are used mainly for learning and training. Thus, legal issues and special precautions must be attended when using online quizzes for fully evaluate students at school.

B. Web Teaching Communities

One way to achieve online collaborative work is by building web teaching communities. These may allow rich synchronous and asynchronous work discussions, mainly trough the chat and forum discussions (respectively), which can also be graded by the teacher, giving to students a predefined theme for discussion.

Forums are very often useful to inform students, by posting news topics that can be later read and answered. They are also useful to present work to other groups, or to post questions to be further answered by the teacher or other students. An online teacher [5] should, no doubt, promote the use of the forum as a privileged way to pass information between all participants.

Many asynchronous activities can also be planned by using web forums [6]. Often, it is possible to auto generate e-mail messages to all the forum community, letting know to the participants, or just to certain groups or individuals, that new online activity, information, question/answer has been created. School forums can be restricted or be open access, and can

have more than one administrator or moderator.

Fig. 3 Main topics for a Microprocessors forum

C. Synchronous Training (Chat)

Synchronous training allows real-time interactions. As an example, one can consider an answering session where the teacher and the students can both participate for learning and studying certain themes. Chat activities can work well when the number of its participants is relatively low, and the school learning sessions are often successfully complemented with online chat sessions. These can be particular useful if a student lives (or works) far away form his high school. Note that in a Polytechnic Institution a considerable part of the students are already working, and many of them can only attend the school by evening.
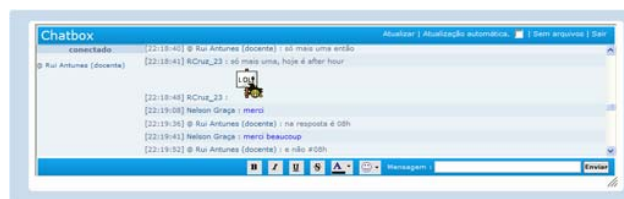

Fig. 4 Chat activity between students and teacher

Although, chat activities may became difficult when the total number of participants increases (usually with more than 50). For these cases, it will become difficult to maintain the communication, for example, if all participants try to send a message at the same time. Elementary chat rules must then be accomplished.

All chat and forum student discussions should be regular.

D. Web-based Courseware

School contents can be complemented by web-courses and lessons, produced with available multimedia tools. By using streaming web media (audio and video flash presentations) it can be added much more content information and interactivity to a learning process. Rather than just having elementary .pdf or Powerpoint information repository files stored in web pages, web-based courseware brings more interactivity and is now full part off the e/b-Learning concept.

Online curses, presentations and webinars give rich interactivity, as voice, audio and flash animations are present, and also because these allow users to study by lessons. They can be very helpful for understanding laboratorial tools and projects. Many online curses can bring along also, at the end of each module, a special quiz session that has to be made in order to pass to the next module or lesson. It is important too, that activities could be exported to any web page, for further flexibility.

In this work *Articulate Presenter* tool was used, along with a screen recorder/flash converter application-*ALLCapture* [7].
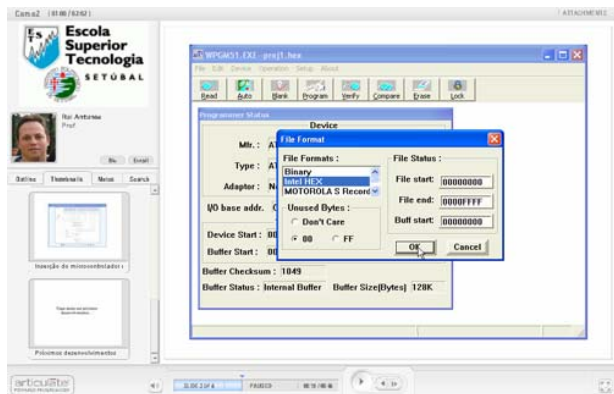

Fig. 5 Microprocessors online flash-based presentation

IV. MEASURING THE LEARNING MODEL

There are many factors that contribute to the learning success. Traditional measuring forms, such as students paper/online surveys are just not enough now. Other methods are also relevant, like for instance, to measure the students online activities at forums, chats, the students quizzes participation, and other collaborative working data.

Recent tools [8] are available to find out how often online activities are accessed by students, along with its grades. For example, it is possible to get the students traffic, or the activity of a certain online test, for a predefined time interval.

Not only is important to make online contents and promote online activities, but also, is important to measure students activity on all of these. A developed multimedia lesson, or a quiz that is not used, will not be of worthwhile. Activities only are crucial if students and teachers indeed really uses them.

Next figures shows online quiz activities nº 1, 2 and 3, between June 1 and July 31 (2008), for the Microprocessors curricular units (EACI, EB and EEC classes), teached at Setúbal Polytechnic Institute.
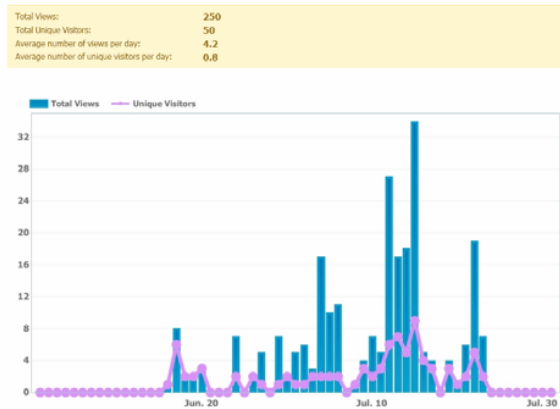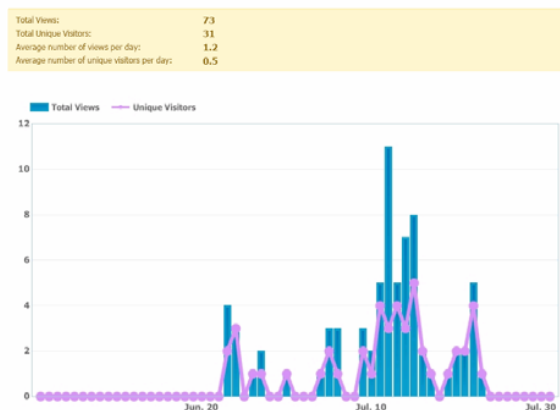
Fig. 6 Traffic for Microprocessors quiz activity nº1

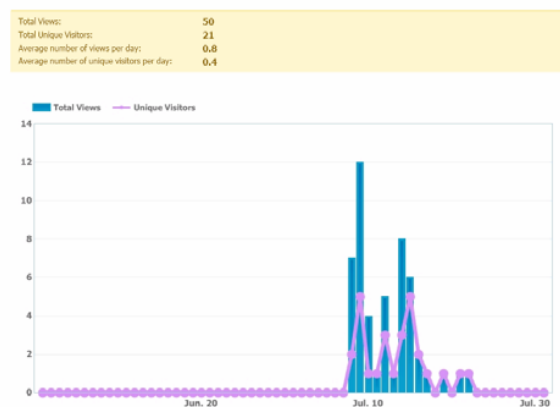Fig. 7 Traffic for Microprocessors quiz activity nº2

Fig. 8 Traffic for Microprocessors quiz activity nº3

Microprocessors EEC classes only had access to quizzes for the last two weeks of July (2008). So, during this full period most of the student population was from EACI and EB classes (approximately 20 students).

Articulate Online is a tool that allows to monitor quiz activities and web-courses. From collected data it is possible to check if the e/b-Learning model is in fact being successfully adopted. The figure below shows data activity for quiz users:

Date/Time	User	Status	Score
7/10/2008 12:51 AM	Fernando Fonseca lucho_cruz2@hotmail.com	Incomplete	30%
7/9/2008 11:24 PM	Fernando Fonseca lucho_cruz2@hotmail.com	Incomplete	--
7/9/2008 10:46 PM	Fernando Fonseca lucho_cruz2@hotmail.com	Incomplete	20%
7/9/2008 9:51 PM	Fernando Fonseca lucho_cruz2@hotmail.com	Incomplete	--
7/9/2008 8:51 PM	José Trigo	Passed	70%
7/9/2008 7:03 PM	Nelson Graça nelsongraca@hotmail.com	Passed	70%
7/9/2008 6:57 PM	Nelson Graça nelsongraca@hotmail.com	Incomplete	--

Fig. 9 Sample nº3 quiz activity at Microprocessors curricular units

TABLE I
PARTICIPANTS RANK FOR MICROPROCESSORS QUIZ ACTIVITIES

Rank	Name	Total Views	Final Exams Grade (*0-20*)
1	Fernando Fonseca	74	--
2	Marco Tavares	37	*13,0*
3	Max Pires	31	*13,2*
4	Eduardo Álvaro	30	*5,7*
5	Carlos Baptista	29	*9,5*
6	Nelson Graça	21	*9,5*
7	Gilberto Tavares	20	*9,5*
8	Jorge Rosa	17	*13,3*
9	Luis Maia	12	*10,3*
10	Marconi Menezes	8	*11,3*

All three quiz online activities for Microprocessors curricular units had a total of 373 accesses, with an average of 4.2 views per day for quiz activity nº1, 1.2 views per day for quiz activity nº2, and 0.8 views per day for quiz activity nº3.

User's rank was obtained from *Articulate Online*, to find out which students used more the quiz activities:

Final Microprocessors exams where yet traditional made on paper and at the classrooms. Comparing the final exams grade results (grade *0* to *20*) obtained from those 9 students that more had worked on the quiz modules, it can be seen that only one of them failed to pass in the final exams (grade less than *9,5*). For all the other students, near 37, that did not use quiz activities and still have made the final exams, the medium grade rate was approximately *11,08*, less that the medium grade rate for all 20 users that worked on online quizzes (*11,36*). Two from the three best exam grades ware obtained within this last group.

Although with 464 total views and 24 messages published, the forum activity had less student participation, because 67% (16) of all message posts for Microprocessors EACI and EB where form the teacher, as shown in Fig 10. Two students from the top-8 message rank failed in the final traditional exams.

Rank	Name	Messages	Percentage	Chart
1	Rui Antunes (teacher)	16	67%	
2	Rui Antunes	2	8%	
3	Jorge Rosa	1	4%	
4	eduardo alvaro	1	4%	
5	Nuno Ventura	1	4%	
6	Baptista	1	4%	
7	Ana Mafalda	1	4%	
8	RCruz_23	1	4%	

Fig. 10 Forum posts ranking

An average of four students participated on several regular online chat sessions. From these, only one failed in the final exams. All recognized that collaborative work helped them.

V. CONCLUSION

This work revels that it is possible to teach and simultaneously motivate students to be autonomous. In the proposed e/b-Learning model some important steeps should be attended, such as to sequentially define collaborative tasks and activities; to re-socialize teachers and students on developing methods and techniques (preferentially using web-based courseware and streaming media tools); to teach and communicate within web student/teaching communities, and also trough synchronous training sessions. Finally, it should be provided to maintain all information available online, and always give the ongoing feedback to our students.

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