FLEXIBILITY ON LEARNING PROCESS

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Abstract: On this paper we present a methodology (FlexLearn), which allows flexibility on learning process. Using this methodology will be possible students to choose frequenting classrooms or online classes. On this paper we present some rules and procedures, which certainly may provide flexibility on the teacher's curricular unity. We also present those we consider to be the best practices to the FlexLearn methodology application success. On a curricular unity that implements FlexLearn methodology, teacher will be able to provide instructions, contents and activities proposals, ensuring classroom and online activities students learning. The activities proposals contents, both for classroom and online students, must be equivalent, assuring the learning compliance.

1 INTRODUCTION

FlexLearn methodology will allow learning process flexibility, in courses that use face-to-face or blended-learning methodologies. The methodology will be implemented in the courses that are taught in Setúbal Polytechnic – High School of Technology.

Through FlexLearn methodology implementation in courses, students may choose to attend classroom sessions or alternatively, make learning activities online without needing to go to institution, except at agreed intervals. This methodology will allow students to choose how they want to achieve their learning, allowing freedom of choice.

With FlexLearn methodology implementation, teacher should be able to plan his course providing instructions, contents and activities proposals to ensure the learning quality, both for students, who attend regular classes, and for those who choose to perform only online activities.

The proposed activities are not necessarily completely separated, although usually they are not the same for students of both types of participation. However, they must be equivalent, ensuring that learning is effective in both modes.

The proposed learning activities, regardless the format chosen to participate, must:

- Be presented effectively (and professionally);
- Represent added value to the student in pursuit of learning goals;
- Motivate students;
- Use assessment methods that effectively certify the acquired skills.

2 E-LEARNING SUSCEPTIBILITY

To flexibly courses we must analyse if all the contents of a particular curricular unit can be taught remotely, as effectively as, the teaching traditional method. This analyse is important because, there are some contents with specific characteristics preventing that learning in e-Learning methodologies is as effective, compared with the learning face-to-face methodology.

Bednarczyk and Rudak (2009) refer three characteristics that make an issue of an academic field that could not be e-taught (or taught using e-Learning methods), which means it cannot be transferred to the Internet without registering losses

in terms of educational quality (regardless of the used technology).

- A subject isn't susceptible to e-teaching if to accomplish their learning, requires interaction between people (eg, teacher - student, student - student) and can't be replaced by the interaction allowed in an e-learning environment.
- A subject isn't e-education susceptible, if we demand that students work or have contact with real materials or tools, which cannot be replaced by 3D representation systems, or not be available to everyone in their residence place.
- A subject isn't e-education susceptible, if it requires practical skills acquisition or conducting experiments that can't be performed in a virtual environment or in the student's residence.

In many curricular units, like mathematics, the traditional teaching is based two types of classes: theoretical and practical. In theoretical classes are set theorems, demonstrated some of the most important, results are presented and exercises are solved to illustrate. Students must complete the knowledge obtained during classroom, by reading the manual that includes detailed explanation of the matter.

The mathematics teaching transfer to Internet based platforms doesn't involve significant changes. Lectures in classrooms can be replaced by video or multimedia objects, incorporating text, sound and image. In addition, the textbook with detailed exposition of these matters can still be used. Teacher and students have at their disposal, in the distance learning platform, communication tools that allow the first one to propose activities and monitor its implementation. Also discussion forums allow students to put questions and seek for answers, but they can also answer questions from colleagues, and this whole process takes place under the supervision of a teacher.

Another interaction example is the exercises sending by teacher to be solved by students, individually or in groups, which should send the answers to the platform, being accessible to their colleagues. So this way we simulate the practical lessons.

The interaction that is required for mathematics learning can be effectively achieved through mechanisms provided by distance learning platform's like Moodle.

There has been none of the characteristics that make it a matter not susceptible to e-teaching, the

math teaching transfer to a remote mode only requires changes in how it is taught traditionally.

The traditional foreign language classes, English for example, are based on the reading of prepared texts in that language, teaching grammar rules and vocabulary, such as conversation activities between teacher and students in foreign language.

In this case there are a number of factors, issues and activities that can be easily transferred to the asynchronous teaching in e-learning methodology. Teacher can provide texts, videos or other learning objects, prepared for distance education that support and consequently allow us to simulate the performed activities in language laboratories. Moreover, the work done by students can be corrected and returned with comments by teachers using the platform. We can also implement a set of online tests that allow students to practice grammar and vocabulary.

However, in foreign language learning some aspects of interaction between teacher and student that take place in classroom can't be effectively replaced by the interaction allowed by the available tools on the distance learning platform. In particular it's not possible for the teacher, with asynchronous tools, to make a correction to the student's pronunciation. This is only possible in the classroom, or eventually using a synchronous tool which may allow real-time dialogue between teacher and student. However, if we do not intend to use the synchronous tools, we can assume that in the foreign language teaching context there are issues or activities that are susceptible or and others not to e-teaching.

In the case of chemistry, in addition to theoretical knowledge, which can be transferred to the internet, the chemist has to acquire practical knowledge. At any given time, students will need to contact directly with the materials, feel the smell and viscosity, among others. In addition, they must contact with the tools used in lab, learning to handle them.

Thus, as in the case of foreign languages, some chemistry topics and activities learning aren't executable in e-teaching, particularly because chemistry education requires that students work with real materials or tools that can't be replaced by 3D representation systems and aren't available for all students in their residence place.

When we evaluate the subject susceptibility to e-education, taking into account the second and third characteristic, we can consider engineering as a good example. An engineer, besides his theoretical knowledge, must have practical skills and know the different types of tools, materials and used

techniques which can't be learned only through pictures, video or simulation in virtual environments. At some point, an engineer will have to work using tools and in real laboratories carrying out experiments which may enrich his reality knowledge.

It's therefore the teacher's responsibility to define contents and activities in each curricular unit, which are not susceptible of e-teaching, according to the susceptibility characteristics defined previously. For all the subjects and activities not susceptible to e-teaching, student's presence in the classroom in moments previously defined must be obligatory.

3 LEARNING OBJECTS

The teacher should prepare in advance the objects that will support the activities. A first step is to define the objectives and competencies to be acquired by the students, later must be defined the content and activities that students must accomplish. Once defined the content and activities, learning objects should be prepared.

These objects preparation could be an intimidating task for the teacher. In most cases, teachers don't have skills or knowledge to conceive elaborate interactive multimedia objects, which require the production interdisciplinary team's establishment. Given the budgetary constraints and the large number and variety of curricular units that make up a course, these teams establishment is generally unaffordable for the educational institution. Alternative strategies are required.

We can anticipate some rules that help and facilitate the task of teaching the resources definition that will be used in the distance education context:

Objects traditionally used in classroom teaching, are generally valid in online learning
Textbooks, pdf documents, powerpoint presentations, are study useful objects, whatever the mode of teaching.

In addition to traditional objects, for students who do not attend classes, teachers should provide video objects with sound and image to simulate a live class.
There are several alternative strategies to obtain these objects. The simplest is to search the internet, on YouTube (www.youtube.com), Teacher Tube (www.teachertube.com), or in the various learning objects repositories such as Merlot (www.merlot.org), or MIT repository (ocw.mit.edu), any object that meets the requested requirements. In

many knowledge areas such as mathematics, there is a large videos profusion and other objects that cover various topics and can be used as part of the course.

Another strategy is to introduce video and sound in powerpoint which are usually used in the classroom. This can be achieved by using a tool like Articulate (www.articulate.com).

You can still turn to tools like HyperCam (www.hyperionics.com/hc/) or Screencast-o-matic (www.screencast-o-matic.com), which capturing sound and image directly from the computer screen can be used in short explaining videos production of a particular subject.

Finally, an alternative strategy, with higher costs, is to directly record the classes, and provide these videos to students in online mode.

Use the resources provided by the distance learning platform for the learning objects parametrization.
The distance education platforms, such as Moodle, provide a relatively easy to parametrize tools kit, enabling the teacher, with limited computer knowledge, parametrize relatively elaborate learning objects and useful in the teaching process.

Tools like the lesson, wikis, mini-test, forum, allow teachers to implement and support a diversified e-activities set.

4 FLEXLEARN

The FlexLearn methodology is based on the design courses theory proposed by Beatty (2008) and is supported on six fundamental principles: possibility of student choice, activities outlining and compulsory attendance moments, equivalence, reuse, support and good practices.

Possibility of student choice: Provide alternative participation modes and allow students to choose between different modes

The proposed activities for each participation mode should be duly proposed and scheduled, providing students the possibility of choice. Without choice there is no flexibility.

Activities explanation and required presence moments: Must be pre-defined the activities and times when students must necessarily be present in the classroom

Some activities may require the student's physical presence in the classroom, for example to perform a test or an experiment in the laboratory. The teacher should explain in the discipline plan the activities

and times when all students must be present in the classroom, including students who opt for online participation mode.

Equivalency: Provide equivalent learning activities in all participation modes

Alternative participation modes should lead to equivalent learning. The equivalence, however, does not imply equality. For example, a forum discussion on a proposed topic by the teacher may be socially less rewarding than the discussion on this topic in class attendance. In each case, notwithstanding, students should be challenged to reflect on the learning content, contribute with their ideas for discussion and interact with their peers.

Reuse: Use the learning objects, specifically proposed for each type of participation as objects of learning for all students
Many of the activities that take place in the classroom can be captured and made available on the platform. Podcasts, videos, files of presentations that result from activities conducted in class attendance can be quite useful for students who opt for online participation mode. Similarly, the activities undertaken by students online, such as those reflected in conversations in chat rooms, asynchronous discussion forums, work groups, glossary entries, can be important learning material for students following attendance mode. Learning objects that result from activities undertaken by students in different ways, should therefore be provided as study elements for all students

Support: The teacher should ensure support mechanisms for students equally effective in both modes of participation
In both modes, the teacher should ensure mechanisms that allow the student to ask and see their doubts clarified. In present mode, students can ask questions in class, furthermore, the teacher usually reserve a time in his schedule to attendance in his cabinet. For the online mode students, the teacher should provide mechanisms, such as a forum for questions or a schedule for chat attendance where students can ask and clarify their doubts

Good practice: In both participation modes the teacher must follow a set of procedures that are identified and accepted as good practice
The teaching quality is largely by the observance of good practice. The teacher should present the best appropriate practices to each teaching mode: face-to-face or online.

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