MONITORING AND CONTROL LEARNING PROCESSES BY USING PROJECT MANAGEMENT STANDARDS

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ABSTRACT

This thesis is about monitoring and control learning processes recurring to techniques from the project management field. This assumes that we can reformulate the teaching and learning processes as if they were projects.

Most of the well known normative for project management were developed by the Project Management Institute (PMI) and is called PMBoK - Project Management Body of Knowledge. It consist in a set of well established tools and techniques for managing projects. Our interest is not only the monitoring and control phase, since that is not possible without a very good planning. Therefore, the planning phase, namely the estimation of the activities duration and cost is also in the main focus.

By "learning process" we have a pedagogical and technological eclectic perspective. We could use the term x-learning, letting the letter "x" be substituted by "electronic", "blended", "problem-based", etc. What we desire is to improve the learning process, for which the combination of any technological, pedagogical or social modes are beneficial (if well applied). Anyway, the use of technology should not be dispensable, and what we propose is a work practice sustained by an information technology infrastructure, within a context where an individual is learning, autonomously or in group, locally or at distance, synchronously or asynchronously.

Nowadays, in which the change is continuous and galloping, education and efficient delivery of information are very pertinent themes. Associated to the development of the information society, the technological support seen as an enabler of the whole process has a fundamental role.

Organizations are convinced the last differentiator is their human capital. The ability to absorb information rapidly and to learn skills necessary to adapt to a constantly changing environment is extremely important. Not only in business, but also in educational institutions, new ways of delivering training are been adopted, which is known as "online learning".

Independently of the field, the vast majority of educators feel that preaching isn't enough, and the only way to achieve a successful level of education is by practice (Geist, 2007). By one hand, we have the instructor-centered learning with the emphasis on the transfer of information from the teacher to the student. This conventional lecture-based course is classified as an objectivist model of learning (Keys, 2003), also described as passive learning or explicit knowledge. By the other hand, we can transfer the focus from instructor to student making the learning experience student-centered. Many terms have been coming to appear to describe the use of practice in educational settings: constructivist activity, project based, work based, active learning, or experimental learning (Geist, 2007; Keys, 2003; Munns, 2001; Kloppenborg, 2004). In this context we can foresee the use of project management methods with great application in education. In fact, the process of learning bears similar characteristics to the management of projects (Munns, 2001).

The learning/teaching processes, more or less enabled by technological artifacts, can be formulated as projects, or programs (from the project management slang), in the sense that students has to achieve certain objectives, with deadlines and constraints, imposed by both internal and external sources. Based on that, a set of tools and techniques can be applied to help achieving the educative goals. Namely, the monitoring and control metrics (to measure and to intervene, respectively) can be very profitable in all the teaching/learning process.

When using technology, the two perspectives (instructor-centered and student-centered) also exist. There are a lot of advantages when using LMS's and, consequently, this teaching/learning methodological advancement we propose, based in project management techniques can and should be included in the existing technological infrastructures. Current systems has some features for student activity tracking but they as little or no information about offline activities. This also conducts to an opportunity.

Efficient delivery of training is very important, and computing is the big enabler for that, but we cannot forget the pedagogical part as the most important one, such as the ones we can found in the case of project-

based teaching. Techniques, methods and computing automatisms from the project management field are not yet integrated into the current learning management systems, and this constitutes the opportunity we found. We want to develop that, to test it, to prove that it was well implemented and to conclude that it has impact in the learning process.

Stated that, our hypothesis is that the learning activities can be seen as a project, or a program, and can be managed with the same tools and techniques that are used in project management. A project can be described as a list of interlinked activities that, once executed, conduct to the realization of some objectives. A project is a temporary undertaken, elaborated progressively, with the objective of creating a product or service that is unique.

Monitoring and control a project touches every facets of the project management life cycle. Changes can occur that impact project scope, time, cost, and quality. These changes need to be managed to assure there are no downstream impacts. While engaged in a project it is necessary to be aware of the impacts and affects of too little or too much resources and communications. By example, some times a student go to a lesson but what he really needs in that moment of his learning is to practice a specific exercise. Of course teaching is difficult to do in a so individualized way but the computational tools for automatic reasoning can have an important contribution in this respect.

The educational research shows that monitoring students' learning and providing learners with appropriate and prompt feedback is an essential component of high quality education. This applies also to distance education because the current Learning Management System (LMS) functionalities are not enough, as the literature also refers.

At present there are some trends for project-based education. By example, in parallel to the Bologna standardization in Europe, universities are reformulating the curricula to a more project oriented education. It seems obvious the usefulness of bringing to the educational context the methods, techniques and tools from the area of project management and to adapt them to the management of learning projects.

The main deliverables of such kind of projects are not tangible, consisting in an amount of knowledge the learner has to acquire. A big issues is how to represent this knowledge, because the fundamental metric for monitoring and control is the percentage of physical progress of the different activities.

For besides, there is still the conviction that all this will only make sense if the teachers, and the students, use appropriate computing tools, those tools similar to the ones that project managers use. A central data repository is an essential source of information to study the student's behavior, which we will have to build, and on which we will have to develop a set of data analysis.

Some intermediary results we will obtain during this work are the following: a LMS / PMIS (Project Management Information System) integration guideline; a mathematic model to explain the historical data about activity duration based in parametric modeling techniques, to make possible the correct planning for future projects; a methodology to plan the timings of a course (what to study and when), and to control the learning process (i.e. the project execution) in conformity with existing standards, such as SCORM (Sharable Content Object Reference Model); a set of templates with learning project plans, with knowledge representation, and a method for physical progress assessment, with OLAP (On-line Analytical Processing) reports for easy data analysis.