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Self-regulated Learning in Technology Enhanced Learning Environments: Problems and Promises

Antonio Bartolomé, Per Bergamin, Donatella Persico, Karl Steffens, Jean Underwood

Editors




SHAKER VERLAG

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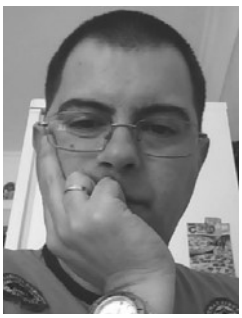
Building proactive teachers: A workshop to provide for self-regulated learning experiences in teacher education



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KEY WORDS

Community of practice, Higher Education, moodle, self-regulated learning, social network analysis, teachers' training, technological tools.

ABSTRACT

This paper addresses the rationale and structure of a teachers' training workshop which was held at an institution of Higher Education in Portugal during the academic year of 2010/2011 based on self-regulated learning and e-learning using *moodle*. We will begin presenting the background and institutional context of the workshop and its theoretical framework, drawing on *Connectivism*, *self-regulated learning* and *communities of practice*. After that, we will explain the structure of the workshop and suggest strategies to assess its success and conclude with some final thoughts.

INTRODUCTION

The Bologna Process has brought new challenges to Higher Education in Portugal; it has also provided us with the characteristics of a new type of student: more

interventionist, proactive and master of his own learning process. The challenge for teachers is the redefinition of pedagogic and didactics processes, closer to the reality of scientific research, relegating, without neglecting, the transmission of knowledge to a more secondary role. Based on this fact, Higher Education institutions feel the need to train their teachers on theories and methodologies where issues such as problem based learning, self-regulated learning and e-learning and tools like *Learning Management Systems, Personal Learning Environments* and *Networks* must prevail even if it means going out of the walls of the institution.

Training Higher Education teachers in the use of technological tools and Learning Management systems must not be reduced to learning technical and technological skills. They must learn how to use them with pedagogical support. Having in mind that we should give an example of how not to teach in a directive way we designed a workshop based on the concepts of self-regulated learning (Wolters, 2010; Bentivoglio et al, 2010) sharing some traits of the *massive online open courses* (MOOC) designed by Siemens, Downes, Cormier and Kop (Siemens, 2010). Downes (2009) proposed autonomy, diversity, openness and connectedness and interactivity as the principles of a connectivist dynamics. Being restricted to teachers of the institution the dimension of openness is the only one not completely assured. Nevertheless it might be called a *massive online closed course* (MOCC).

For the design of the workshop we had to take in account some considerations and theoretical concerns involving pedagogy and didactics in Higher Education, intending to go further than technological tools use issues as mentioned by Steffens (2001):

> While self-regulatory activities are controlled cognitively, they encompass more than the monitoring of cognitive activities.
> Motivational and emotional processes are also important in learning and they too need to be regulated. At the same time, multimedia computer programs and the Internet have come to play an important role in present day's learning environments. The question therefore arises as to what extent these new technologies facilitate the acquisition and improvement of self-regulated learning strategies. (p. 77)

We wanted teachers participating in the workshop to be proactive and build their own path of learning, with the possibility to work collaboratively throughout the workshop or grouped at specific times, either online, face-to-face or both.

BACKGROUND

The increasing integration of Information and Communication Technology (ICT) in Higher Education has been a challenge and a research area in constant growth. The progress of technology along with the great evolution of the Internet and the invention of a plethora of devices have brought significant challenges to teachers and students.

Among the technologies to support technology enhanced learning there are *Learning Management Systems* (LMS) that have been adopted by many institutions of Higher Education, either as support in the classroom learning or in full distance learning. In Portugal, these institutions have started to adopt the use of LMSs due the increasing use of ICT and due the Bologna Process and the creation of a *European Higher Education Area* (EHEA).

The integration of ICT in the Portuguese education system has been constant since the 80's culminating in 2007 with the approval of the *Technological Plan for Education* which gave computers and internet access to almost all students, creating challenges and opportunities for Higher Education.

In this line, Lencastre and Monteiro (2008) conducted a study involving teachers from an institution of Higher Education in Portugal which aimed at evaluating new concepts, attitudes and approaches to the learning process using Moodle. The same study emphasizes the importance of research on teaching and learning with LMS.

THE INSTITUTION

Higher Education in Portugal is engaged in a large set of transformations due to the Bologna Declaration which aims to standardize and ensure a high transfer of skills and mobility of teachers and students in Europe (European Commission, 2010).

Having that in mind, the Institution has made an effort to modernize its technological infrastructure to implement a training model able to answer 21th century learning challenges, where the presence of

moodle is a constant, as support of face-to-face teaching, or in blended courses where the teaching has a strong online presence. To this effect teachers must be trained on how to use the technological tools and how to use them in a pedagogically sound way.

In December 2007 the Institution started the *Online Education Project*. Having selected the LMS Moodle, given its dissemination in the Portuguese Higher Education institutions (as in primary and secondary schools), the technical aspects were arranged in conjunction with the Technology Division of the Institution assuring good conditions for the use of the Institution internal network, and a Help Desk was designed to offer specialized support. In terms of pedagogical implementation pivots of the project were appointed on each campus and selected teachers called pioneers or precursors, responsible for promoting and repeating the instruction processes with their colleagues and the academic community (Lencastre & Monteiro, 2008).

Implementing a physical pivot on each *campus* served two objectives: first, to have a local reference point for potential users, and second to take into account the local realities of the various *campi* (Lencastre & Monteiro, 2008). The pivots and pioneers received internal training on technical and pedagogical use of the Moodle LMS . These *pioneers* sought through a viral network to extend the use of the technological tools available to other teachers (Lencastre & Monteiro, 2008, 2009). In 2009, the project was renamed *Online Project*, and in 2010 the *Online Education and Training Unit* was made formally responsible for assuring access to and availability of the Moodle LMS and the training of students and teachers on each campus.

As in all processes of change - and this was significant - there was resistance, some of which had been studied in the literature as non-immediate acceptance by teachers and students, e.g. the fear of technology. The Portuguese education system itself was reluctant to change although we were witnessing some changes in Higher Education, which are only now being followed up in primary and secondary schools, creating a gap between current objectives of Bologna process and the previous training of students who were not provided with the tools essential for being integrated in their jobs smoothly (Lencastre & Monteiro, 2009)

However, the aspect to which we should pay more attention is that teachers tend to offer some resistance to the process because they feel they are more exposed, both in terms of knowledge, or in terms of digital literacy level, to the challenges of a networked world. Teachers feel pressured and recognize that they are not prepared for this challenge. It is therefore evident that the training of teachers will have to move from technical to pedagogical and didactic training and that training has to be as inclusive as possible.

Having implemented local teams, the next step was to promote and create a culture of technology use based on educational principles. In order to achive this, the team of one *campus Online Education and Training Unit* designed this training workshop.

We took in account some of the aspects indicated by Attwell (2010) as factors of success in continuing personal development:

- *Peer learning*; the exchange of experiences is a key factor in the creation of a community among teachers;
- *The shift from large group to small groups*, throughout the process, teachers are encouraged to join interest groups, regardless of the main group, thereby allowing learning in context and personalized pathways;
- *Informal learning* will be stimulated and taken in account in the structure of this workshop as "Informal learning, by definition, cannot be planned but can be facilitated by creating time and space for networking, inclusive leadership styles, democratic staff relationships and the development of staff as a learning community." (Attwell, 2010, para. 6)
- *A clear definition of artefacts and their link to practice*, the artefacts created or presented during the workshop must have immediate practical application in the classroom so that teachers see the advantage to learn how to build them;
- *A reflective pedagogy and didactic basis*. Moments of reflection on pedagogy and didactics related to the practice must be propitiated. These moments are planned sessions for debating the implications of the use of tools and artefacts in learning;
- *Time management*. Time is always a factor to consider in any model of training. Hence, in designing the structure of the workshop we decided to keep all modules open and

available throughout the training so that teachers themselves decide on their time management of the learning activities;
- *Observation of practice*. All experiences and their sharing will be encouraged. These feedback will also enrich the training and practice of colleagues.

THEORETICAL FRAMEWORK OF THE WORKSHOP

Connectivism

Connectivism, according to de Waard (2010), is a concept that fits perfectly into contemporary learning. The field of learning is advancing at great speed like a major ecosystem, being designated as organic learning.

The framework that Siemens (2004) used to support the theory of Connectivism is based on the need to adapt/rearrange the theories commonly used in the creation of learning environments - Behaviourism, Cognitivism and Constructivism. It takes into account the impacts of the use of technology in learning, as Pappert and others who have been advocating since the 60's changes in education through technology, especially computers. These authors (Siemens, 2004) also point to the actual changes in our society that increasingly requires rapid adaptation to various environments, making the traditional learning methods obsolete because they cannot or will not encourage those digital skills.

George Siemens states that "Connectivism is the integration of principles explored by chaos, network, and Complexity and self-organization theories" (Siemens, 2004, p.21) supported by eight fundamental principles. He argues that it is important to be able to separate and distinguish information that is or not important depending on the contexts. To better understand this, Siemens (2009) organized a table showing how Connectivism differs from other theories:

- Learning occurs based on the recognition and interpretation of various patterns in distributed networks enhanced by technology;
- Factors that influence learning are the diversity of networks, the strength of the nodes and context;
- The role of memory based on adaptive pattern is representative of a particular state;
- The transfer of learning is generated by the addition of nodes and network expansion;
- Learning becomes complex with a quick change at its core, based on various sources of knowledge.

Verhagen (2006) argues that Siemens brings up issues not on the level of learning, but on the level of the curriculum because Connectivism is being geared more towards a pedagogical approach rather than to a learning theory. This author also emphasizes that learning is defined as a result and not as a process. In response to these criticisms, Siemens (2006) contends that "Connectivism is strongly focused on the linking to knowledge sources... not simply trying to explain how knowledge is formed in our heads" (p.37) and concludes that it is irrelevant whether Connectivism assumes a predominant role in school change. The most important is: "(...) that educators are reflecting on how learning has changed and the accompanying implications to how we design the spaces and structures of learning today." (Siemens, 2006, p.39)

Self-regulated learning (SRL)

According to Turing and Yang (2009), SRL describes the repertoire of strategies to overcome the challenges that have been posed to Higher Education by the Bologna process and lifelong learning issues. We hope that through SRL participants will become more proactive and seize opportunities to carry out new teaching strategies and didactics in Higher Education. We define SRL as a person's ability to remain focused on the progress of his/her learning. This workshop aims to involve all teachers from Almada *campus* in a meaningful set of activities.

Assuming that teachers can be described by the SRL model suggested by Pintrich and colleagues (Wolters, 2010) as constructive and active participants, we will ensure that they follow the four phases of SRL:

- *Forethought*. Planning, goal setting and prior knowledge activation;
- *Monitoring*. Keeping track of on-going progress and performance;
- *Management or regulation*. Use and management of several learning strategies to complete the tasks;
- *Reflection.* Generation of meta-level knowledge about their activities.

During and after the workshop teachers are supposed to design and construct the courses they will deliver

on moodle so they can enhance interaction and learning of their students through this LMS.

Community of Practice (CoP)

One of the goals of the project will be the development of a CoP, which will grant the trainees a support for skills development through sharing of practices, experiences and resources, collectively constructed knowledge and mutual aid during the training.

What defines CoPs? Wenger defines them as "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly." (Wenger, 2006, p. 4). CoPs have three defining characteristics:

- A *domain of knowledge*, that corresponds to a shared group interest that ensures the group identity.
- A *community*, as members engage in joint activities: they share information, discuss, help each other, and learn from each other while pursuing their common interest within the community. The community is not closed; it allows the integration of newcomers in an apprenticeship process.
- A *practice*, as a "shared repertoire of resources" (Wenger, 2006, para. 8) for their practice is created beyond the community of interest, which can be embodied in a knowledge base, but in most cases is only evident in members' practices and interactions.

In a CoP, learning occurs mainly in an informal way (Wenger, 1998, 2006). This workshop although apparently a formal training will allow for informal learning; it is an internal training without grading and evaluation aspects typical of formal learning. Since the trainees are not geographically distant (all of them work in a Higher Education institution with a good informal climate) the interactions will take place both in the virtual environment and face-to-face, contributing to the emergence of informal learning.

Another important factor in a CoP is that learning is more distributed and not so focused on the expert (teacher), something explicitly provided in this training setting (enabling peer-to-peer professional development activities). The temporal persistence of the CoP beyond the strict duration of the course will be a sign of the CoP maturity, with the community showing increasingly greater independence from the experts and new member integration capabilities.

In the development of Cop the following elements are paramount: defining the area of shared inquiry and the key issues (domain), developing relationships and sense of belonging (community) and developing the body of knowledge (methods, tools, documents and practice) (Wenger, 2002) and must be taken in consideration.

Nevertheless, some conditions must be assured to enable a successful CoP. Fontainha and Gannon-Leary (2007) present as critical success factors for building a CoP; according to these authors technology must be mastered and accepted as a means of communication and a user-friendly language (netiquette) should be used to foster communication as support for development of trust and sense of community. Members should have a sense of belonging, effective shared understanding and a sense of purpose and time to allow the trust and consequently the sense of community to grow.

Structure of the workshop

This workshop is designed for teachers to outline their own learning, with no predefined paths or a proper sequence of learning. It is intended that teachers improve their experiences, their knowledge and their technical skills from the information provided during the workshop.

The structure of the workshop addresses the main activities of the LMS Moodle and its pedagogical use as presented in figure 1. Participants can build their personalised pathway.

Figure 1. Workshop structure based on Andrade (2006)

The transformation of information into knowledge occurs when participants establish interactions between themselves and the artefacts available in asynchronous discussion forums, synchronous forums and even in face-to-face communication.

The exchange of experiences can occur spontaneously or through the moderation of the workshop instructors who will assume the role of facilitators, avoiding direct instruction.

Based on these ideas, the workshop's objective is that the participants will develop pedagogical, didactical and technological elearning skills in a community of practice, with open dialogue, learning actively in flexible pathways, at a personalised rate and being able to reflect on processes and products of their learning.

Each module is independent of the others and can be done without prior knowledge, as the modules are

offered throughout the year. Participants may attend only some of the modules (or even only one).

ASSESSMENT

We will use Grounded Theory (GT), Community of Practice assessment (CoP) and Social Network Analysis (SNA)in order to answer the following general questions:

- What perceptions did the participants gather from the workshop?
- To what extent was a Community of Practice (CoP) built and developed?
- Which networks arose from the interactions between participants?

Grounded Theory (GT)

GT originated in the 60's with Glaser and Strauss (2006); it was suggested as an alternative method for qualitative research. The collection and analysis of data are to give rise to a theory grounded in data, supported by three types of coding: open, axial and selective.

The three structural elements of the GT are:

- *Concepts*, basic units built from the conceptualization of data;
- *Categories*, the highest level because they are more abstract giving us a means to integrate concepts into a theory;
- *Prepositions*, generalized relations between a category and a concept associated with it.

Community of Practice (CoP)

To identify the presence of CoP we will use some of the indicators presented by Wenger (1998):

- Sharing a common purpose;
- Easy flow of communication;
- Shared ways of doing things together;
- Knowledge of what others do, know and how may contribute;
- Shared repertoire (tools, representations and other artefacts;
- Shared private (group) codes and jargon;
- Overlapping of recognition of belonging to group among participants.

Wenger also lists as typical activities in a CoP problem solving, requesting information, seeking experience from others, reusing assets, coordination and synergy processes, discussions, documentation projects, mapping group knowledge and gaps (Wenger, 2006).

We will draw from these indicators and the community assessment tool developed by Andriessen & Verburg (2004) to assess the presence and development of the CoP.

Social Network Analysis (SNA)

The increasingly frequent adoption of LMS by Educational Institutions and the need for more knowledge about the users and the use made of these systems led us to adopt the method for SNA evaluation of our workshop. “The visualisation of online student engagement/effort is shown to afford instructors with early opportunities for providing additional student learning assistance and intervention – when and where it is required” (Dawson, McWilliam, & Tan, 2008, p.221). As one of the main objectives of our project is to stimulate collaborative work among participants1 , we assume that the type of analysis provided by SNA will meet the needs of assessment that we foresee for this workshop.

The SNA can be defined as “the disciplined inquiry into the patterning of relations among social actors, as well as the patterning of relationships among actors at different levels of analysis (such as persons and groups).” (Scott, 2000, p.2) In this sense, the SNA describes relational patterns and examines how involvement in social networks helps explain the behaviour and attitudes of members of the networks (Wasserman & Faust, 1994).

The learning network that will be created in the context of this workshop will be reviewed by us in order to assess what relationship patterns are created by the actors among themselves in this network and how these may create and/or influence learning opportunities. “By obtaining information, producing insight, undertaking analysis and collaboration in the course of knowledge building and by way of an instructed learning process, these networks create all manners of interpersonal associations and learning opportunities.” (Wang, 2010, p.4)

[1] Hereafter referred as actors according to the terminology of social network analysis.

Our purpose is to analyze the interactions established between the network actors (and sub networks) to assess the following:

- Generic characteristics of the network that develops during the workshop (size and type);
- Participants, their types of action and participation in groups;
- Function, distribution and representativeness of participants;
- Groups and subgroups created in the network;
- Participants and subgroups activity within the network;
- Degree of stakeholder participation;
- Relationship patterns;
- Communication channels used and types of transfers and resource flows.

We believe that this kind of research provides an opportunity to better manage the education process either by the trainers/facilitators or by the students/trainees.

FINAL THOUGHTS

The advantage of using technological tools in education, especially in Higher Education, lies in the easy access to information and media at the disposal of teachers and students. With this workshop we aim to increase the participants' proficiency in the use of these tools and to contribute to their scientific, pedagogical and didactic use.

The workshop structure will allow participants not only to identify their own learning needs but also to choose their own learning pathways and to ajust those pathways so the workshop can meet their expectations.

The changes observed in the education system for the last decade presented challenges that must be overcome with new processes that adapt to the new technological and pedagogical reality that affect all educational institutions and forces us to rethink the whole learning process.

In this context of exchanges we hope to contribute to the quality of teacher's education process and we expect to improve the quality of future workshops on the basis of the quantitative and qualitative data gathered throughout this first experience in order to contribute to quality teachers' training that meets the needs of Higher Education in this new millennium.

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