

E-assessment through Social Networks in a Portuguese High School Context - A Conceptual Framework

Joaquim Fernando Silva¹, Francisco José Restivo¹

¹Faculty of Engineering at University of Porto

Key words: *e-assessment, games, informal learning, social networks.*

Abstract:

In this paper we present a technology enhanced learning (TEL) conceptual proposal in a Portuguese high school learning scenario. We consider technology should be on actor's goals and interests service rather than other way round. Therefore our approach method consists in developing an e-assessment based tool that teachers can easily use and students will have fun in doing assessments. During the framework conceptualization some questions were raised. What are the advantages in using such learning space compared to other learning systems? What are the privacy consequences of moving learning into spaces traditionally used for leisure by our young students? What are the trends in social network web sites? These issues are later on answered in order to support our approach.

1 Introduction

Information technology based on social networking sites, enable citizens to find information, to produce content and establish connections among users, in different and dazzling ways. However there are still some barriers, for the changing attitudes to occur, that effectively push citizens into digital social environments. Not surprisingly these barriers are less frequent among digital natives, who produce and intensively consume volumes of textual messages, namely in chat rooms, look into thousands of user profiles in social network sites, like Facebook or Hi5, and watch user generated content like YouTube videos, Blogs, Wikis or other Web 2.0 tools, having a clear disconnection compared to more traditional forms of production and information consumption [1]. On the other hand, digital immigrants prefer more traditional forms of finding information in the Internet, using search page engines, like Google, instead of using real-time search engines for user-generated media, like Technoratti or Wikipedia. Therefore there is a clear distinction in the way both types of users view the social networking sites.

Recently an OCDE PISA report, showed in Portugal eight out of ten students use computers at home and they are the ones who show the most positive attitude towards the computers usage, along with Austrian, Canadian and German students. Also it shows that students, who use computer, have better school performance when compared with the others [2] and new forms of digital learning should enhance the learning styles and attitudes of learners, who are growing up connected.

Despite teachers, who usually are digital immigrants and young students, mainly digital natives, having distinct approaches to internet and information communication technology

(ICT), both are actors of an active and social process of learning in schools, where a changing attitude is urging, though schools must ensure students receive the best education possible, for achieving the essential skills to become full citizens. In order to sustain this goal, the assessment aspects of learning are very important to effectively guarantee the skills acquisition.

There are basically two kinds of assessment. The first one, summative assessment, usually occurs at the end of a set of learning activities and the grade results, achieved by the student, are registered by the teacher as a final mark. The second one, formative assessment, is usually performed by teachers in the beginning of a course to identify the knowledge background of the students. But if it is used during the course, it will give continuous feedback about student's current state of knowledge acquisition. However it is not used very often during the learning process, because teachers claim they don't have enough time to do several assessment tests, or even perform the compilation and management assessment results, which are time consuming. In order to ease this task, we have chosen to provide a Computer based Assessment System (CbAS) to be mainly used outside the classroom. An interesting place for using a CbAS should be in students' social networking site, a space where they interact with their community friends. In this paper we focus on using social networks for learning, with continuous formative assessment. Additionally, in order to motivate and engage students, we plan to use a pirate's game, with a treasure map scenario. Later on this tool will be validated in one particular high school of Portugal, with students aged between fifteen and seventeen years old.

This paper is organized in the following sections: section 1, this section, introduced and presented the difficulties in using technology enhanced learning and the importance of formative assessment; section 2 will describe the social network usage as a learning space; section 3 will reference the Portuguese use case scenario, section 4 will reference the teacher's and student's point of view in using social networks; section 5 will show a learning and performance architecture where teachers can use assessment mechanisms to improve their teaching practices and students can be better motivated at school; finally in section 6 there will be some pointers of ongoing and future work.

2 Social Networks and Learning Spaces

Social networking sites enable users to create well-developed profiles and share personal information with a wide range of friends. Interestingly they tend to distinguish their relationships into different social networks. Usually students tend to build their primary social network of their close friends and family very close to the secondary social network of classmates, reflecting the school importance in their relationships [3]. In Portugal, students prefer to use Hi5 to Facebook, Orkut or Myspace, for building their social network (figure 1).

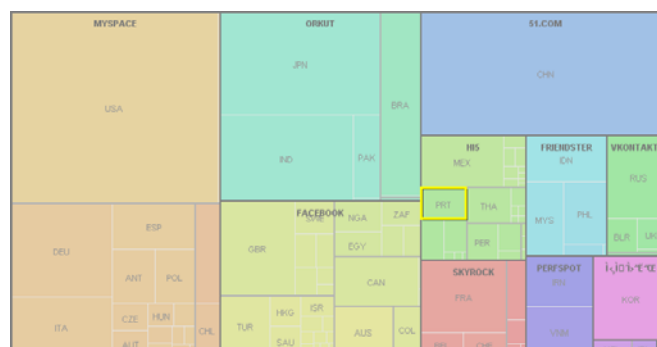


Figure 1: Social Networks Treemap [4]

The majority of them simply use Hi5 to make their lives easier, strengthening their existing friendship networks [10]. They use it to share their digitised creations. In fact they are creative and expressive as in the past, but the difference is that the digital connectivity enables new exchanging ways. Only few users highlight negative aspects to social networking. For instances privacy and safety issues regarding social networking site leaving settings open, as well as, some risk and harm done by users namely posting content (especially photos) that could be reputationally damaging or online bullying [5],[6].

If we look now at schools usage, most of them have banned access to social networking sites and in a recent paper Boyd showed that students were more likely to access social networking sites on the Internet at home than anywhere else [3]. Therefore we argue schools rather than harnessing the technologies and blocking the social networking sites in name of safety and despite teacher's unconfident levels, there should be a changing attitude towards social networking sites usage in learning spaces.

Fortunately some teachers and other school practitioners have already realised the advantages outcome the disadvantages. They recognise the value of learning outside the classroom and the importance of having a digital space where students can recognise and transfer those skills in new situations and context [4, 7]. Several examples of using Web 2.0 tools and social networks in education have been accomplished with interesting results. In general, they all consider interaction creates opportunities for enhancing class cohesion, and the quality of interaction is important in the learning experience. Students learn about one another through digital profiles. They experience the social phenomena of being connected, expanding their learning structures and cultural experiences, fostering intercultural skills [7].

In comparison with more traditional Learning Management Systems (LMS) like Moodle, Sakai or even Blackboard WebCT, social networking sites have the advantage to meet the students "on their territory". But the teachers do not need to use students' social networking site, or even stop using their LMS environment. That is, the social networking students' site is used as a place where they perform the learning activities. The teacher can use for instance Moodle LMS and export the activities to other Personal Learning Environment (PLE). In order to reach these outcomes several issues must be taken into equation. The parents' guidance, the teachers' tutoring, the media support, for instance e-books or videos, and of course the school providers. The traditional LMS learning spaces should change the focus towards the learner and provide additional features, namely social learning experience. Besides an online social networking site, has the potential to reduce social exclusion, thus increasing student's self-efficacy. Accordingly, students with strong self-efficacy have a higher level of confidence to fulfil assignments, whereas those with weaker self-efficacy may not, as they fear criticisms from the network's established members. For social networking site, the core actions are communication, description and connection which converge with the learning actions. The successful integration of such tools with learning features, will require understanding of the social and educational contexts by the students, the teachers, the school system and the parents [8].

3 Case Study- A Portuguese High School

Our research project encompasses an evaluation of using a social networking site aggregated with assessment activities in a Portuguese high school with students aged between fifteen and seventeen years old. At that particularly high school there are different courses, divided

accordingly to specific matters and they all are divided in classes. Each class has different teachers from a particular domain. However, very few students are highly motivated for the completion of studies with high success in almost all domains. The school is seen as a place where they can socialize and meet interesting people. In general they like school or being at school. So what are the main issues we must pay attention in order to instill motivation in students? Despite all, a Portuguese high school is a place where distinct actors (students, teachers, parents) interact and have different levels of commitment and responsibilities for the success of student's literacy. We must reinforce all this actors' interaction in helping students to like even more school and increase their levels of motivation and participation [9].

4 The School Learning Actors

4.1 Teacher's point of view

The social connectivity is starting to be seen as a window opportunity by researchers and teachers to engage students with different learning experiences. Truly newly empowered learners will give more focus to learning systems based on conversation, interaction, on sharing, creation and participation [10]. In fact some teachers are already performing experiments using games, videos, music or TV realizing technology is influencing the skills and attitudes of learners in a changing learning paradigm. The e-learning 2.0 systems go in this direction because comprises resources and services organized in order to offer learning opportunities in a network environment [10]. Already McKenzie had claimed that a web system must provide a structure, supporting the student's investigation and keeping them on the path while seeking "the truth" about whatever issue [11]. But teachers should also use caution when establishing social networking site relations with students. In social networks, the teacher does not attempt to "friend" students, and shouldn't accept friend requests. This personal policy is designed to keep the teacher out of student social spaces, keeping interaction only for class. Just as the teacher's perception of the student may be affected by observing his or her online social activities, students may view teachers in differing lights after viewing their social networking profile [12].

4.2 Student's point of view

Nowadays students have a high degree of familiarity with social networks. For them, computers and Internet are just tools to help them communicate with their friends. Their digital activities are commonly grouped around self-motivation, ownership, purposeful, and peer-to-peer learning [6]. Self-motivated students learn a whole range of skills when interacting with each other. They always are proud about their creative output and for them every action has its reason behind to validate its existence. Also peer-to-peer learning is present when they help themselves to solve problems, collaborate with each other and create their own knowledge.

The schools mission, in this changing world, should offer mechanisms to strengthen the relationships that could bridge the gaps between what students are learning outside the school with what they are learning inside the classroom and between the skills they are really acquiring with those they will need to become full citizens [6]. The conceptual framework of skill assessment presented next, goes in this direction, trying to scaffold the students digital activities, bridging those referenced gaps. The added value of the tool will be a distinct digital informal learning environment, plugging teachers with students' roles, in a simple manner.

5 A Conceptual Framework of Skill Assessment

5.1 A Cultural Shift

Students are more socially active outside the classroom than inside. Most of them even consider the classroom activities boring with no interest and the most exciting and interesting subjects can be found in other places like in the Web. The Demos report reinforces the fact that parents are witnessing in first hand this cultural shift and despite 17% of them doesn't know what their children are doing with phones, on the Web or when playing computer games, 50% don't consider classroom lessons as the most importance activity for their children to learn [6]. Moreover 67% of these parents consider their child use of technology is essential for building general knowledge. In other words, everyday activities are starting to become more important than formal contexts. Unfortunately not always the skills achieved in informal contexts are the most essential ones for the student development [13]. That is why we are planning to use a formative assessment tool and map it with an informal learning approach, rather a formal context. Still, we argue, formal contexts have an important role in students' development and schools should maintain this type of assessment to guarantee the effective level of skills achievement. Also the teacher scaffolding is crucial to keep students acquiring the essential and needed skills. The key aspects in the learning process are still the people and not the technology. Technology is a mean and not an end towards education. We should use it but the education goals, as in the past, prepare the youngsters for the adult life with the required skills to become full citizens should be teacher mediated.

5.2 Conceptual Framework

The previous considerations of informal learning outside school, the teacher guidance with students feedback and technology usage are reinforced with the Connectivism theory, which asserts the learning of knowledge happens in a distributive manner, based on a network of connections formed from experience and interactions with a knowing community [1]. Additionally our theoretical background is based in a game-scenario solution, because students enjoy playing and achieve higher scores in a community of friends. Therefore, we conceptualized a learning tool, that supports the teachers task of uploading assessment activities, present them to students with a game scenario and provide feedback about their performance. Basically we are using e-assessment in combination with games in a social networking site. A social network site to support the learning tool was selected in order to involve the students' friends, specially their parents and show them what their child is learning at school.

As many students spend large amounts of time on Hi5 and are familiar with Hi5 interface and norms of interaction, this should be an advantage choice for the inclusion of learning activities in Hi5 [14]. Each of these learning activities is triggered by each teacher of a particular discipline of one school class. Expectably there will be a large amount of learning activities, which should be displayed hierarchically within an information structure. We are considering using a treemap approach, like the one used in figure 1, where it is possible to dynamic show all topics in just one rectangle. This rectangle is built accordingly to all topics provided by the teachers and later on students can choose which topic (small rectangle) to work with [15]. The Treemap visualization [16] provides an interesting and simple user interface, where users can easily browse and select the activities and have a clear picture of their on-going knowledge acquisition in particular skills. In order to transform the treemap into an even more appealing work area, we introduced the concept of pirates and treasure map. The idea is to associate each small rectangle of the treemap into one piece of the treasure map. When each student successfully finishes each activity will have a score associated with that particular piece. The

system tool will provide partial/total scores and students can become aware of their real knowledge and change their attitude from “I know everything” to “I must study this topic”. Moreover by providing feedback to the teacher about the students’ performance it is possible to make changes and work in class the students’ difficulties. If summative assessment tests were only used, the previous goals would have become difficult to obtain and the informal aspects lost. However games and social networks are not popular at the teacher’s point of view and assessment tests are not particularly interesting for learners. Therefore our system architecture, for supporting learning activities, has two different perspectives:

The teacher:

- Views a web place where he or she can upload the activities. Each activity (quizzes, inquiries, fill in the blanks, etc.) is an individual element and can be imported from other learning environments (e.g. Moodle).
- Classifies each activity with a skill, a topic and level of difficulty.
- Receives the overall performance of the class.

The learner:

- Views a pirate’s treasure game scenario with assessment activities.
- Can add it to their social networking site and invite friends to play along.
- He or she can repeat any number of times and choose in the map a particular group of activities. The game can be played by any member of their social networking and returns the top scores.
- The teacher feedback will be sent only with student’s authorization.

There are several learning gadgets within Hi5 social networking site, but they are stand alone applications without the possibility of changing the questions presented and without visualising the achieved knowledge.

On the figure 2 we present our proposed system architecture. It is called L-tree and can be followed with more detail at www.l-tree.org. The tool should promote students with teacher and community interaction around topics studied at class.

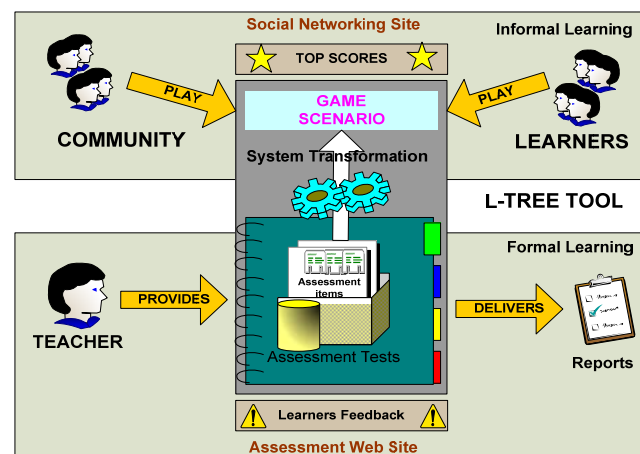


Figure 2: Proposed L-tree assessment system architecture

In general the teacher provides different types of assessment such as: calculated questions, matching questions, multiple choice question type, true/false question type with feedback and short answer question. After the teacher classified the activity, the system puts it into the right pirate’s treasure piece, accordingly to the Treemap algorithm. The system changes unconnected assessment tests into an attractive pirates treasure game where the learners will play. Each time the user plays and finishes one activity obtains a score and some suggestions to do better on next time. For instances in the failed items, the system can give suggestions (visit a web page or read a specific book page) helping the student finding the right answer.

Also the system can perform auto-assessments tests, asking to the player “how well are you doing?” and showing a list of classified skills in a yes/no answer form and then compare it with the scores obtained in each piece of the map. If there is a direct relation with the no answer skills with the undone topics, then the player is conscious of the flaws and the score is increased. The game will keep track of the top scores of all registered users. Another idea to follow is, in order to maintain the players’ motivation, the system can change the assessment items difficulty accordingly with the student-player’s performance. Additionally the system will visualise, in a treemap, the overall performance of the player in each topic in order to identify the achieved skills. Finally the system sends feedback, about student’s performance, to the teacher(s).

5.3 System stand out requisites and knowledge visualisation

A precedent survey [17] was conducted by the authors to find which requisites such a learning system should have. We came with OpenSocial Google’s platform approach, data portability and interoperability. This first aspect is related with the possibility of using this gadget in Hi5, as well as any other OpenSocial platform like Orkut, the second aspect is related with the possibility of users later on use this tool in other PLE, and the third aspect enables teachers to import assessments from Moodle, with the GIFT format. Additionally the functionality of visualisation is very important, as said before, to enable teachers to classify the activities and learners to browse the activities in each topic. If the teacher provides different activities for the same topic and skill but with different levels of difficulty, the system can select which activities to present. In a first stage the idea is basically order the activities in topic/skill and difficulty. After the completion of the easier activities, then the system increases the level difficulty of the available activities. It is possible to be in different levels of difficulty in different topics, and by using different colours the learner will know in which topics he or she is doing better.

6 Future and Related Work

Our ongoing work is to deliver questionnaires to be distributed among teachers and students for this case study to get teachers' and students' view in order to make additional changes on the conceptual framework. Next the L-tree tool with the game scenario of distinct assessment activities will be started to be developed, starting with the system specification. Finally we expect to analyze the impact of this social embedded learning tool in a real context. We plan to use it in three classes of a Portuguese high school, which will later on validate our claim that embedding social networks with personalised learning activities is an added value feature. In fact this is our research contribution; deliver a tool capable of integrating the teacher efforts in providing assessment activities, in a students’ game scenario, with community support and involvement in the learning process.

However we are conscious the results and conclusions we will obtain in the end of our research cannot be generalized for all students and each school has its own reality. We expect, with this case study, to demonstrate a gaining advantage of adapting technology to particular education scenarios in order to effectively use ICT in learning contexts. Through continued research in this area, we also expect to better understand our students and create exciting new opportunities for learning.

The power of digital spaces is just starting to become a promising as well as challenging field of study.

7 Acknowledgements

I would like to thank FCT for the support provided through scholarship SFRH/BD/36206/2007.

References:

1. Siemens, G., *Connectivism A Learning Theory for the Digital Age*, in *eLearn Magazine*, 2005.
2. OCDE Programme for International Student Assessment (PISA). [cited June 2008]; Available from: <http://www.pisa.oecd.org>
3. Boyd, D., *Why Youth Love Social Network Sites: The Role of Networked Publics in Teenage Social Life*. Youth, Identity, and Digital Media. on Digital Media and Learning, 2008: Cambridge, MA: The MIT Press.
4. Many eyes. *Social Networks Treemap*, 2008 [cited May 2008]; Available from: http://services.alphaworks.ibm.com/manyeyes/view/S9_5xLsOtha6ITWj1F9DM2-.
5. Ofcom Office of Communications, *Social Networking A quantitative and qualitative research report into attitude, behaviours and use*, 2008.
6. Demos report, *Young people are spending their time in a space which adults find difficult to supervise or understand*, 2007.
7. J Rivoltella, P.C., *Digital Literacy: Tools and Methodologies for Information Society*. Idea Group Inc (IGI), 2008.
8. Liccardi, I., et al., *The role of social networks in students' learning experiences*. ACM SIGCSE, 2007. **39**(4).
9. Silva, J.F. and F.J. Restivo. *Applying Virtual Learning Environments in a Portuguese High School Context*. in *Epia2007*, 2007. Guimarães-Portugal.
10. Downes, S., *Learning Networks and Connective Knowledge*. Instructional Technology Forum, 2006.
11. McKenzie, J., *Scaffolding for Success*. The Educational Technology Journal, 1999. **9** (4).
12. Mazer, J.P., Murphy, R. E., and Simonds, C. J., *I'll See You On "Facebook": The Effects of Computer-Mediated Teacher Self-Disclosure on Student Motivation, Affective Learning, and Classroom Climate*. Communication Education, 2007. **56**(1): p. 1-17.
13. Jenkins, H., *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*, in *Building the new field of digital media and learning*, 2006, MacArthur Foundation: Chicago, Illinois. p. 72.
14. Stutzman, F.a.K.-D., J.,. *Modelling Cultural Acquisition in Online Social Networks*. in *Proceedings ASIST 2008*, 2008.
15. B. Shneiderman, *Tree visualization with tree-maps: a 2d space-filling approach*. ACM Transactions on Graphics, 1992. **11**(1): p. 92-99.
16. Ben Shneiderman. *Treemaps for space-constrained visualization of hierarchies*. [cited May 2008]; Available from: <http://www.cs.umd.edu/hcil/treemap-history/>.
17. Silva, J.F. and F.J. Restivo. *Towards the convergence of technologies using open standards in social networking software*. in *EDEN08*, 2008. Lisbon-Portugal.

Author(s):

Joaquim Fernando, Silva, Engineer
 Faculty of Engineering at University of Porto, Informatics Department
 Rua Dr. Roberto Frias, s/n 4200-465 Porto PORTUGAL
Joaquim.silva@fe.up.pt

Francisco José, Restivo, Professor
 Faculty of Engineering at University of Porto, Informatics Department
 Rua Dr. Roberto Frias, s/n 4200-465 Porto PORTUGAL
fjr@fe.up.pt