A SOCIAL SOFTWARE FOR MOBILE LEARNING

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ABSTRACT

The traditional teaching methods of the Learning Management Systems (or LMS) are rigid in nature and impose limitations on the teaching process. By having a closed pattern, these tools end up hurting the student, for preventing it from interacting with anyone who shares the same interests as him. As a result, the concepts of community, relationship and interaction between users are required to overcome these limitations. This paper proposes the development of an architecture for creating a social software that enables the use of online social networks automatically created for students through their mobile devices. Besides, this architecture has been created based on web services, what makes it possible the integration with MLEA (Mobile Learning Environment Adapter), an application that allows students to access Moodle through their mobile devices.

1. INTRODUCTION

For many years, the studies of student/teacher interactions had been focused on the teacher. It had been studied how he should behave and all the responsibility in learning was attributed to him. Education was rigid with almost null participation of the students. Much time later there have been a few changes, but discussions related to the advances in educations are still common.

A current definition of learning is given by Chatti *et al* (2010). The authors claim that learning is like a network (they use the term LaaN - *Learning as a Network*) and highlight the connectivism between students, advocating that knowledge is inside the network. It says that learning begins individually by a student and later is concentrated in his *Personal Knowledge Network* (PKN). A PKN is comprised of a myriad of knowledge nodes which are the people who act together and help each other to view the connections in the network.

One of the main research goals to potentiate socializing among students is the use of social networks in the learning process. According to Wasserman and Faust (1994), a social network consists of finite set of actors and the relationships defined between them. Social networks have come to exist also on the Internet, being called Online Social Networks, and became popular with the rise of Web 2.0 and social network sites. This technological breakthrough has made the accessibility and involvement of social networks reach millions of people around the world. The evolution has been followed for integrating new technologies and experiences in social networks with formal education and in order to this happens education must take a new course, similar to Web, and become more open, dynamic and student centered (Chatti *et al* 2006).

Recent research indicates that interaction and collaboration between users are strengthened and improved through unification of educational environments and mobility, using new devices like smartphones, for creating mobile learning (Baloian and Galdames 2004). Thus, the potential of mobile Internet makes it easier to access resources from anywhere at any moment.

However, it is common to have computational models aimed at educational purposes that only transpose to virtual the technicist model of learning, in a similar way as students experience in regular classes. Such models prevent students to develop their social abilities because they focus on knowledge transmission in a hierarchical and passive way, where the student is seen as a mere container for the knowledge provided by teacher or machine.

Thus, this paper proposes the development of an architecture for a mobile social software that automatically creates online social networks for Moodle students. The networks can be viewed and articulated by the users from their mobile devices, enabling the creation of new communities, organized into topics. This way, students become much more connected with those who really matter, without geographic or time boundaries, potentiating interaction and learning between them.

Moreover, the social software is integrated with MLEA (Mobile Learning Environment Adapter), which is an international project, created in Panama, that aims to enable the access to Moodle resources through mobile devices (Crespo *et al* 2010). Such integration allows MLEA students to transparently create online social networks organized into communities with specific topics and formed by students from different instances of Moodle. Nevertheless, the social software can be used independently of MLEA.

This paper is organized as follows: Section 2 presents the concepts of online social networks applied to education; Section 3 shows some related works; Section 4 presents the proposed architecture and its integration with MLEA; and Section 5 presents some conclusions.

2. ONLINE SOCIAL NETWORKS IN EDUCATION

Online Social Networks (OSN) are a virtual representation of interaction between people, that is, a simulation of real social networks. These networks have gained more evidence with the popularization of social networking sites, becoming target of educators around the world. The success of these new ways of interaction, proved by the number of active users, have attracted the attention of some scholars in the field of education, such as Phillips *et al* (2011), who created a guide describing several ways of how to use Facebook for education, among which stands out the use of groups, online spaces of people who interact and share information with each other. The convenience relies on the information sharing, because when one member of a group posts a link or article, every member of that group is notified of the update. Moreover, Ratcham and Firpo (2011) propose the use of social networks technologies in classrooms as a way to improve learning through the creation and maintenance of virtual communities of practice.

Despite the benefits, there are educators against the use of social networks in education. Some argue the lack of privacy, as a huge personal exposure, since most people use social networking sites for entertainment and talk about issues related to family, friends and leisure. Another reason is related to intellectual property terms, which ensure all information discussed in the sites belong to its owner, removing any relationship to the institution that promoted this debate (Li and Liu 2009). Thus, it would be more interesting to add features of social networking to Moodle instead of integrate it with existing social networking sites.

3. RELATED WORKS

This Section presents some related works to the proposed subject. In this sense, it will be discussed works whose purpose is to promote a more interactive Moodle environment by adding social networking features to it.

Developed by Ben Werdmuller and David Tosh, Elgg is an open-source application for creating personal blogs and social networks that allows, among others, the sharing of text, photographs, music and videos (Canpbell *et al* 2005). The differential of this application is that it can be integrated with Moodle, forming a union called Megg (Moodle and Elgg) whose purpose, according to (MoodleDocs 2011), is to provide the student with an environment where they can create their own learning space connecting themselves with other students and forming online social networks. The integration module is available in (MoodleCore 2007).

Mahara is a system for creating e-portfolios that are articulated by online users. This system also provides a Weblog, a résumé builder and a social networks system, connecting users and creating online learning communities. This system can be integrated with Moodle, being then called Mahoodle (Mahara 2011).

Laydner (2007) presents the development of a module for Moodle, created at ITA (Technological Institute of Aeronautics) that aims to add social network features to the Moodle environment. The idea of this module is to expand the profile of each user by adding tags to identify their specific interests. The user has the possibility to associate its profile to a set of tags, creating new ones and even browse through the users

with a particular tag. This way, students with similar interests can join together more easily since they can maintain a list of users with their same interests.

The works presented so far have the same objectives of provide Moodle users with social networks capabilities. The proposed social software differentiates from them in the sense that it allows Moodle users to create their own social networks automatically and articulate these networks while using their mobile devices. Besides, it is integrated with Moodle forum, so that users can create or join social networks from a particular discussion. This is useful because a student can continue that discussion in another environment that involves more people, since the networks created are not restricted to the boundaries of a particular course.

4. ARCHITECTURE

The proposed architecture, shown in Figure 1, utilizes a client/server model, in which the cellphones play the role of client while the server side is represented by the environment where the Moodle instance and the proposed software are installed.

The main components of this architecture are: **Web Services Layer:** acts as the communication interface between clients and server. For each required functionality, there is a Web Service that must be invoked by the client passing the appropriate parameters; **Module of Control:** responsible for orchestrate the execution of the other modules in order to provide the desired functionality. This module works as a façade between the Web Services and the other modules; **Module of Access:** has the role of perform queries on Moodle database in order to find relevant information for the social software (*e.g.* personal information of the users such as name or profile picture). This module is fundamental to the automatic creation of the social networks. Given some tag, it has to identify the discussions associated with this tag and the users who have participated in these discussions. Such users are considered candidates to join the social network being created, because they possibly have some interest in the subject of the network; **Module of Networks Construction:** responsible for every function of constructing and articulating of the social networks. It takes the candidate users (output of the Module of Access) and decides which of them will indeed join the network based on the users' preferences. The management of the networks, like adding or removing members, is also a responsibility of this module; **Module of Persistence:** manages the application database, performing queries and storing relevant information, such as for example the networks created.
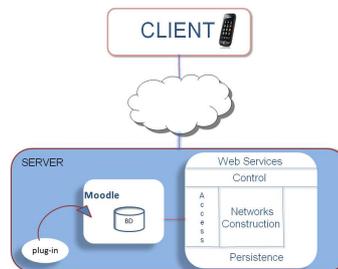

Figure 1. The architecture of the proposed social software.

Besides these modules, the proposed software contains a plug-in for Moodle that allows teachers and students to add tags to the discussions they create in the forums. These tags are understood as the interest of that particular discussion and consequently the interest of the users who have participated in it. This information is stored in the application database to be used by the system while creating the social networks.

4.1 Automatic Construction of the Networks

Since the main goal of this work is to automatically create social networks organized by communities, this Section aims to describe how this is done. Figure 2 shows an overall picture of this process and the following paragraph describes each step necessary to create a new network.
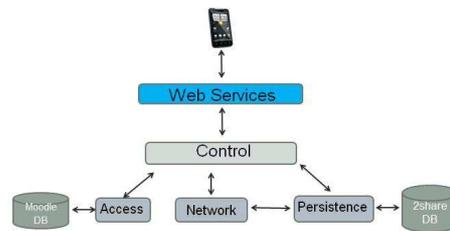
Figure 2. Automatic process of creation of the networks.

Initially, (i) the student, using a mobile device, requests the creation of a social network. At this moment, (ii) the client application invokes the Web Service responsible for it, passing the subject of the network, that is, a tag. Then, (iii) this Web Service calls the Module of Control, which will coordinate the other modules. The Module of Control (iv) invokes the Module of Access, which will query the Moodle database and return the users that might be interested in the subject of the network. Then, the Module of Control (v) invokes the Module of Networks Construction passing the candidate users. This module creates the required network by selecting the users who actually use Moodle-2-share, taking into account their preferences. Finally, the Module of Control (vi) asks the Module of Persistence to store the network and (vii) returns it to the Web Service that had started the process. The Web Service, in its turn, (viii) responds to the client application, who will present the user with the newly created network.

4.2 Integration of the Social Software with MLEA

The proposed social software can be integrated with MLEA, an application for Android devices that enables students and teacher to access Moodle resources through their cellphones and tablets. This integration allows the users to: **(i)** log into one of the applications and use the features of the other one without the need of logging in again. When a user logs into MLEA, it automatically logs into Moodle-2-share and vice-versa; **(ii)** add tags to the discussion they create. This is necessary to keep the consistency with Moodle when the plug-in is installed; **(iii)** create or join social networks from discussions in a forum. When a student does it, he/she can discuss that subject with others different from those who had participated in the forum.

The social software follows the pattern of the Android Dashbord project, whose goal is to provide to the user a home screen that gives an overview of the features that the system provides. The Figure 3 - a) shows this. The integration of the MLEA with Moodle-2-Share happens when the user clicks the start social network button passing the theme that he wants the network to be create, which in this example is about java, as shown in Figure 3 - b). At this time the application MLEA invokes Moodle-2-Share and the participant who started the event will see in his screen the list of users who have interests similar to his, as shown in Figure 3 – c). The Android API supports the exchange of information between different applications, facilitating the development and making this change transparent to user.

5. CONCLUSION
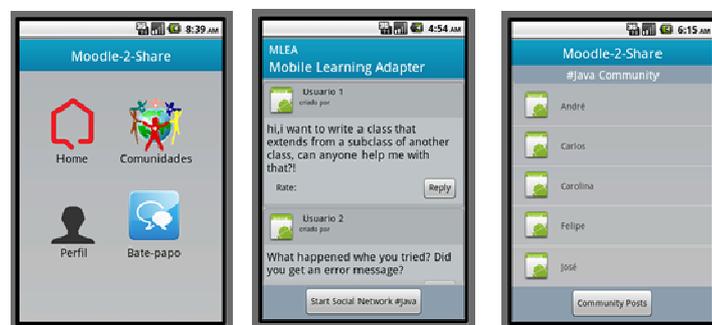
Figure 3. (a) Start screen of the social software; (b) MLEA screen used to begin the process of creating a social network; (c) List of users in the network with Java as subject.

This paper aimed to present the development of a Mobile Social Software that enables the automatic construction and the articulation of online social networks to students and teachers from Moodle. The central idea is to integrate this social software with Mobile Learning Environment Adapter (MLEA) whose goal is to make Moodle accessible through mobile devices. This integration provides new ways of interaction and collaboration between students and teachers that access Moodle through these devices. In addition the proposed software can be used in distinct Moodle instances, from different institutions, and be configured to interact between them. This integration can lead to a gain of knowledge for each student and teacher involved, because it increases the opportunities for exchange of experiences with people who were previously unable to be part of his/her social network.

The main future work is to extent the proposed social software to allow the automatic construction of the social networks through the traditional Moodle, not only the mobile one, and the evaluation of the software with users in a real course, aiming to verify the increase of the interactions and the possible gain in learning through collaborative learning.

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