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SCHOM. A tool for communication and collaborative e-learning

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ABSTRACT

Emerging technologies cause changes in education. These changes result in new human learning processes that evolve to collaborative e-learning approach, where social and mobile networks take a great relevance.

In this paper we introduce SCHOM (SCHOlar Messaging). We have developed this tool for communication and collaborative e-learning in wired and wireless environments. SCHOM, a SaaS (Software as a Service) in the cloud, allows the exchange of information between members of a domain intra and/or inter academic. SCHOM can be used in different communication channels such as e-mail, instant messaging, chats, discussion boards or microblogging. Besides, it supports different devices: smartphones, tablets or computers.

One of the main advantages of this tool is that it ensures the digital anonymous. For instance, one user could send a message to other one knowing his identity. Nevertheless the user will not know the communication channel used to send the message. Each user selects the channels whereby he wants to receive his messages.

Registered users on the system are organized in groups (or organizational units) by forming relationships n:m. Groups in turn can be nested to build hierarchical structures that can simulate real work environments, for example, a faculty with its degrades, courses and subjects, ... A group (each member regardless of the nesting level) can also be receiver of messages.

1. Introduction

Emerging technologies like mobile technologies, its market penetration with smartphones and tablets and young acceptance of them, have opened a huge field in m-learning and collaborative mobile learning. Some studies say (Ryu & Parsons, 2012; Huang, Yang, Huang, & Hsiao, 2010) that factors as social relations and mobile technology affect in human learning process. So the main interest is in the characteristics of these new technologies: portable, customizable and ubiquitous (Ryu & Parsons, 2012; Kim, Lee, & Kim, 2014).

Collaborative learning can be carried out with tools as discussion boards, instant messaging or blogs. With these tools, PC-based or mobile phone-based, students can explain their opinions and they can ask questions more easily than in a traditional classroom (Ting, 2012). Although, some authors think that when these tools are used in a PC they do not fit to the students necessity of mobility and ubiquity that a mobile phone provides to them and currently the students need. (El-Hussein & Cronje, 2010). Other researchers have studied how affect the mobile learning on collaborative learning processes and outcomes (Kim et al., 2014). They suggest that students should use different kind of tools for different situations. And for example, for teamwork, mobile instant messaging could be the best option. Other authors (García Peñalvo, Colomo-Palacios, & Lytras, 2012; Millsa, Knezeka, & Khaddageb, 2014; Xi, Hui, Wu, & Ordóñez de Pablos, 2014) think that internet and mobile technologies have an important influence in the informal learning and it cannot be obviated.

Since mobile learning was born, several tools have been proposed to promote the interaction in higher education (Shishah, Hopkins, FitzGerald, & Higgins, 2013; Zhang, Ordóñez de Pablos, & Zhang, 2012); most of them are based on using SMS and MMS, and some of them use email as way of communication. For example, SHERPA (Schweitzer & Teel, 2011), mobile tool designed and used by teachers and students to facilitate the communication between them. In our University, we have the experience with a communication platform, pioneer in Spain-MoviUPSA (Fraile, Delgado, Sánchez, & Beato, 2007). This platform is based on SMS and email and everyday it is used as a means of communication by faculties, department staff and students in the University. However, SMS

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messaging has significantly reduced its use due to several factors: the cost and the limitation in the content of message.

Recently new mobile instant messaging services have emerged (for example Whatsapp) and these services allow us to exchange messages without having to pay for SMS; another advantage of instant messaging services is that you can send images, video and audio media messages. On the other hand, social networks and microblogging have exploited like communication channels. Social networks, where people with same interests are connected, and mobile social networks, where the communication is using a mobile phone o tablet, are closely related to the learning process. Also both of them, social networks and mobile social networks, can provide to the users an efficient environment in order to share and to distribute information which is necessary to acquire knowledge in a collaborative way. Zhuhadar, Yang, and Lytras (2013) say that Social Multimedia System can help to engage students more effective than classical online learning techniques. They talk about the value of accessing recorded videos on smart mobile device and its effect in the learning process.

A report of Deloitte. (2014) predicts that in 2014 instant messaging services on mobile phone will carry more than twice the volume of SMS. Other reports point in the same direction. They say that communication services are not increasing except instant messaging. Instant messaging is increasing in 8.9 percentage points, and nowadays, is the most used; it is used by 56% of young (Fundación Telefónica, 2014; 2013). Other metrics are also important such as frequency of use (83% use it daily) or user satisfaction (7.9 of 10). So, instant messaging is, nowadays, a very important communication media.

Users use different communication channels; the selected channel is decided by some characteristics, such as, the nature of the communication or/and the entity with which the users want to communicate. So in personal communications they use phone to talk; if they want to communicate with a group they choose instant messaging (as Whatsapp, MSM Messenger, Yahoo Messenger,...); if the communication is with a big group they use social network (as Facebook) and if they want to be heard they use microblogging (mainly Twitter).

Based on our experience using MoviUPSA (Fraile et al., 2007), which is a SMS communication platform used in our University, we developed a new communication tool based on new emerging communication channels. In this paper this new communication tool is presented, SCHOM (SCHOlar Messaging). SCHOM will be used in a university environment and SCHOM permits send messages using different communication channels and using a variety of devices for sending and receiving the messages (mobile phones, tablets or computers which can run different operating systems). The different channels will be: mobile instant messaging, social networks, microblogging and email. SCHOM ensures digital anonymity, is multichannel and multidirectional.

SCHOM is mainly a tool to improve communication between all roles in learning. In this way it is a tool to facilitate collaborative learning. It is especially useful for workgroups and for discussion groups, this is due to the use of the last emerging technologies like mobile instant communication or social networks. Mobile technologies allow learners get in touch with their partners and teachers anytime and anywhere so the learning environment improves considerably.

On the other hand, our tool is not a new e-learning system; it is a complement to improve e-learning systems. Its main goal is make easier the communication between teachers and students and between groups of students. We propose that this better communication will be transformed in more motivated students. So our goal is also increase the motivation of the students.

The paper is structured in this way: in this section we make a review of literature related to the context of SCHOM. In the next section we explain some important concepts to understand the way of working of the tool developed; in Section 3, the own tool SCHOM is presented; after that, we explain the results and some discussions related to our work research, and finally the conclusions of this work are exposed.

2. SCHOM. Concepts

Users of SCHOM can send and receive messages and also they can use discussion forums. SCHOM classifies messages according to nature of messages or to usefulness of these.

So, according to nature of message, messages are classified in:

- Non-persistent. When the message is delivered to the receiver, the system loses its reference. Only sender and receiver have a copy of it. This kind of message is used in private communication between users, using instant messaging.
- Persistent. This kind of messages is used in discussion board, important notices and topic subscription. They may be reviewed at any time.

According to usefulness of message, messages are classified in:

- Notice: It is a message used to post a notice. This kind of message can be send by users with permissions of sending; also the own SCHOM system can send this kind of message to report an error or a warning, in other words, the senders of this type of messages can be users with permissions or the own system. It is a unidirectional message; the sender is not waiting for a response from receiver.
- Private: It is used in n:m communications between users, using instant messaging.
- Discussion: It is used in discussion forums.
- Publishing: It is used in publishing topics.

The user decides what kind of message he wants to receive for each of his channels and then he can configure his account in the system according to his preferences. Furthermore he can block private messages from a particular sender. On the other hand, when a user sends a message, he has available the option to choose all users that he needs to send a message. We will use the term "contact" to refer to the receivers of a message.

A contact can be: individual or group.

- Individual. It is a contact representing a user. We will use contact or user indistinctly.

  Every user belongs to an organization or domain. Every individual contact (or every user) must have a profile. A user profile represents the role of the user in the domain that he belongs to. It is possible to have individual contacts without domain associated but in this case, we are talking about special users who are responsible to make configuration and administration tasks. They are called system users.

- Group. Individual contacts must be organized in groups, so a group represents a list of contacts. To describe the group contacts, we will focus on four aspects: composition, security, structure and types.

2.1. Composition

Composition describes who members of a group are. Members of a group may be individual contacts or group contacts. So it is possible nested groups. When a group is into other group, we

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