

# Secure Collaborative Learning Practices and Mobile Technology

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## INTRODUCTION

During the past few years, mobile technologies have become common in everyday life. Almost everyone carry some kind of mobile technological equipment with him or her, for example a personal digital assistant (PDA), a mobile phone, a multimedia player, such as an iPod, or a laptop computer. The use of these equipments is not limited only to workplaces, schools or homes. Particularly useful information and communication technologies (ICTs) are in educational settings. Especially wireless networks and laptop computers may promote many useful practices of collaborative learning (Cutshall, Changchit, & Elwood, 2006; Jones, Holmfeld, & Lindström, 2006).

On the one hand, the use of mobile ICTs may also diminish the fluency of studying. With technology both restricting and enabling different ways of action, even small changes in technology may lead to substantial changes in the way it is used in educational settings (Waycott & Kukulska-Hulme, 2003). The use of mobile devices and wireless networks in studying may even reduce communality, social contacts, and collaboration between students instead of increasing and supporting them (Kreijns & Kirschner, 2004). These kinds of deficiencies can restrain users from making good use of otherwise advantageous technology-supported interaction environments. On the other hand, if mobile technology is utilized successfully, it can engender students' feelings of belonging to a safe virtual community, which helps to construct shared knowledge when members of the community collaborate and apply information and experiences received from others.

In order to successfully implement mobile ICTs for computer supported collaborative learning (CSCL) it is

important to obtain information how students take into use mobile technologies in their studying and learning. In particular, different features of knowledge sharing and social usability in the virtual learning environment along with issues of data security within the wireless network become crucial with respect to CSCL that is supported by mobile technology.

This chapter explores the role of mobility and social usability features in a CSCL environment on a wireless campus. In our analysis we found features that either support or diminish the fluency of CSCL.

## BACKGROUND

Long research tradition substantiates the benefits of computer supported collaborative methods for learning. The central tenet of CSCL is that a student is part of a studying and learning community that uses ICTs as a mediating tool for social interactions. Koschmann (1996) states the key to successful learning is to support interaction and sharing of experiences by means of technology. Through interaction, students also share distributed cognition (Hutchins, 1995), which means that it is beneficial for collaborative knowledge construction if the members of a community have their own special knowledge. Interpersonal knowledge can only be achieved through the social construction of it and learning can not be separated from its social context (Jones et al., 2006). Computer-supported collaborative learning is successful when students are active, maintain dialogical culture, share convergent goals, and complete tasks together (Dillenbourg, Baker, Blaye, & O'Malley, 1996).

Nowadays, it is essential that students can fluently take mobile technology into use in studying and learning in order to take advantage of the benefits of mobility in CSCL. Mobility, or the movability of devices used in studying and learning, such as laptop computers and wireless network (Luff & Heath, 1998), may benefit CSCL in several ways. Primarily the advantages have been in supporting flexible interaction and continuity between learning contexts. Mobility can also create adaptability and promote accessibility in studying. Finally, mobility can support managing time and learning (Hoppe, Joiner, Milrad, & Sharples, 2003; Roschelle, 2003).

Most importantly, in order to facilitate collaboration and knowledge construction it is of utmost importance that students can easily join mobile learning community, interact with each other, and thus reach a level of critical thinking, mutual understanding and deep learning (Stahl, 2004). For this reason, on a mobile campus students need to fluently interact through laptops in a wireless local area network (WLAN). However, technology supported social interaction does not emerge automatically and the features of the ICTs-based studying environment may even impede it. Therefore, the usability features of the studying environment have to be considered carefully. More precisely, the usability of the studying environment should support social interaction (Kreijns & Kirschner, 2004).

In previous studies, sociability and usability have been considered as two separate concepts: sociability is concerned with social interactions in the online community whereas usability is more focused on the human-computer interface (Souza & Preece, 2004). As a combination of these two viewpoints, social usability is concerned with those features of technology that influence the user's social interaction. We examine social usability in the context of collaborative learning through mobile technology, where it is seen as a prerequisite for taking technology into use and for being able to participate in a virtual learning community.

Further prerequisites for successful CSCL, such as supporting interaction and sharing of experiences, are met when the students form virtual communities: groups of users that communicate via computer and share common interests, aims and resources (Lazar & Preece, 2002). If the users feel secure and confident about belonging to an online community, they want to participate and share their knowledge (Haythorntwaite, 2002). Therefore, in virtual learning communities

social usability refers to the features of technology that facilitate students to take technology fluently into use and to join the community. Moreover, the sense of security emerging from the technology's features promotes social usability by promoting trustworthy interactions (cf. Johnston, Eloff & Labuschagne, 2003). Deficiencies in these factors of usability can restrain students from making good use of otherwise advantageous technology (Girgensohn & Lee, 2002).

## **MAIN FOCUS OF THE ARTICLE**

Although a virtual learning community that works through the net is a social entity, the role of the mediating technology is significant. This paper describes initial empirical results from an ongoing five-year longitudinal study that aims at finding out how the implementation of laptop computers and a wireless network shape the collaborative practices of studying at the University of Lapland, Finland. In the fall of 2004, 582 (85 percent) new students of the university were provided with a laptop computer. At the same time, a wireless local area network (WLAN) was implemented using access points following the standards WLAN 802.11 A/B/G. Support for the standards is built into the same actual devices. The access points do not contain any configuration or information about the network but are connected to switches that guide the operation of the access points. Presently, the network consists of 70 access points, which cover the whole campus area. The wireless network is supposed to be predominantly used with laptops. The computer programs installed in the laptops include ordinary Open Office applications, the Windows operating system, web browsers, instant messaging, e-mail, computer conferencing, and data security applications, such as firewalls and virus detection. (Isomäki, Mattila, Kokkonen, & Pääkkönen, 2004.)

In this chapter we examine collaborative mobile learning practices, where social usability is seen as a prerequisite for taking the above-mentioned technology into use, and for being able to participate in a virtual learning community. Our main aspect is that mobility brings about new features in computer-supported collaborative learning, and that social usability should be investigated as a prerequisite for the emergence of successful virtual learning communities on a wireless campus. The main research questions in this study are:

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