

Exploring New Ways to Support Learning and Communication Using Mobile Technologies

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EXTENDED ABSTRACT:

In the past decade, the Internet has spawned many innovations and services that stem from its interactive character. The emergence of ubiquitous and inexpensive microprocessors and wireless networks has led to the wide deployment of mobile devices that allow us to access and to handle information almost anytime and anywhere. Thanks to the convergence of telecommunications and data communication, actual software applications rely on seamless wireless networking, and thus become inherently mobile. This latest trend is nowadays observable and a clear example is the convergence between two technologies that developed separately during most of the nineties: wireless communication devices (pagers, mobile phones) and handheld devices. This convergence of computing and communication and the mobility and ubiquity of mobile devices open new possibilities with regard to computer usage and information access.

Moreover, the integration of computing and communication is a process that is about to turn phones and mobile terminals into powerful multimedia units (Rasmusson et al., 2004). Diverse multimedia applications have flourished with recent advances in hardware and network technology, the proliferation of inexpensive video-capture devices, and widespread adoption of the worldwide web. All these forms of interactive multimedia and communication offer new possibilities for supporting innovative ways of learning, collaborating and communicating (Milrad, 2003; Thornton & Houser, 2004). While the mobile/wireless computing revolution is having a major impact on the ways people communicate and interact, this transformation does not live up to the promises and expectations when it comes to schools and universities (Norris et al., 2002; Tatar et al., 2003). Thus, there are a number of questions that deserve further exploration. What are the implications of using mobile computing and wireless communication for supporting learning and teaching? What new scenarios and applications will emerge? Are there any design guidelines for developing new interactive mobile applications for supporting learning and teaching? How can we successfully address the problems and realize the opportunities?

In this paper, I will start by giving an overview of what we have learnt within the field of mobile learning in the last years. I will discuss and summarize what experiences have been successful, which the current efforts in this field are and what are the challenges ahead of us. In order to understand the possible impact of cellular phones for facilitating learning and teaching, I will proceed by presenting the results of one of our on-going projects, MUSIS (MULTicasting Services and Information in Sweden). The main objectives of the MUSIS (<http://www.musis.se>) project are to explore,

develop and evaluate a number of innovative multicast services with regard to mobile multimedia information to be distributed to mobile phones in two Swedish university campuses. In particular, I will illustrate how we are designing and implementing interactive mobile services to support learning and communication at Växjö University. The target group for our trials are students from two undergraduate courses in the fields of humanities and technology respectively. Results will be presented and analyzed according to the following categories:

- Design and usability aspects – how the use of cellular phones can provide new opportunities (and restrictions) for learning and communicating
- Implications of the use of cellular phones on the selection and design of services and content
- Evaluation methodologies suitable for assessing design and use of mobile phones in educational settings

I will conclude this paper by making an attempt to provide a wide viewpoint with regard to the use of mobile and wireless technologies to support learning and communication. In this effort I will integrate some key ideas from the fields of education, communication science and engineering. My claim is that we need to develop a broad perspective in order to discuss and to understand the impact of mobile and wireless technologies and their implications for the design of modern IT systems to support learning and communication.

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Biographical Statements:

Marcelo Milrad is a senior researcher at the school of Mathematics and Systems Engineering, at Växjö University (VXU) in Sweden. He is also the co-director of the Center for Learning and Knowledge Technologies (CeLeKT). His current research interests include the design of learning environments to support learning about complex domains, collaborative discovery learning and the development of mobile and wireless applications to support collaborative learning. Marcelo Milrad has published over 50 articles in international journals, refereed conferences and books. He has also been presenting and giving lectures about his

work in more than 20 countries. During the last years he has been serving as a program committee member in a number of international scientific conferences such as CSCL, ICALT, WMTE and CELDA. Marcelo Milrad is an executive member of the IEEE Computer Society Technical Committee on Learning Technology (LTTC) and one of the initiators of the IEEE international workshop on Wireless and Mobile Technologies in Education (WMTE). Prior to entering VXU, Marcelo has been working at the Research Corporation for Media and Communication Technologies, the Institute for Media Technology (IMT), the Center for Human-Computer Studies (CMD) at Uppsala University, and the Weizmann Institute of Science, Israel. During the last 15 years, Marcelo has been directly involved in the development of multimedia based learning environments both in schools, universities and in industrial settings.