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## Editorial

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Advances in Information and Communication Technologies (ICTs) are among the defining technological transformations of the late 20th century (Castells, 1998, Dyson, 1997). Personal Computers (PCs), the Internet, and mobile devices have an immense current and potential impact on societal structure and relationships (Dutton, 1999). This phenomenon has also been witnessed within the domain of education (OECD Report, 2001).

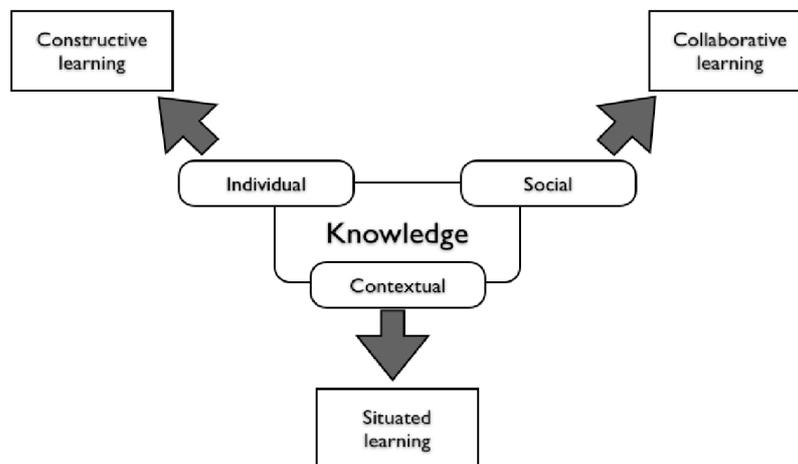
The changes in society brought about by ICT advances lead to expectations for new education systems that are not restricted to traditional education providers such as schools, colleges and universities. Furthermore, such providers increasingly face competition from other knowledge sources, including the entertainment industry, and from enterprises that define themselves as knowledge producers and educators.

*Wear your learning, like your watch in a private pocket (Chesterfield, 1748).*

Mobile technologies provide an excellent opportunity to develop novel education or learning environments. Mobile learning (M-learning) extends the educational context into a versatile ‘anytime and anywhere’ learning experience. It has thus been suggested that mobile technology could be used as a ‘bridge’ between various learning activities, thereby breaking the boundaries of known learning contexts such as formal learning in school, life-long learning, and real-world problem solving activities.

Figure 1 shows the three distinctive learning spaces: *constructive*, *collaborative*, and *situated* that commonly describe the learning process. The constructive learning space, which relies entirely on individuals constructing their own knowledge by learning from books or teachers has long been the major paradigm in the field of learning and instruction. In contrast, both situated learning (creating authentic learning in life-like settings), and collaborative learning (encouragement of pair and group work to solve complex projects and tasks) are more recent pedagogical approaches that aim to empower learners. These approaches may have a profound impact on teacher roles, values and practices. Mobile technologies would offer new possibilities to encompass and integrate the three learning arenas, but more research is needed to test this hypothesis.

**Figure 1** Learning spaces



Source: Extended from de Jong (2001)

The purpose of this special issue on “Current Mobile Learning Technologies and Applications” is to report research that attempts to answer questions surrounding the transformation of learning or education activities by the development and diffusion of mobile technologies. This issue contains six papers that address these questions from a wide variety of domains and cultures across the world. Across this set of papers, aspects of all three of de Jong’s (2001) learning spaces are addressed.

First in this issue, Sari and Tedjasaputra demonstrate, through their ethnographical studies in both Finland and Indonesia, that mobile technologies may have huge potential as part of distance learning environments. They also identify critical challenges to their adoption under current education systems. One of the main conclusions of this paper is that the integration of PC-based and mobile applications might substantially enrich current constructive learning activities at all educational levels (primary, secondary and tertiary). In the second paper, Matsuura et al. show that mobile communication technologies can enhance the autonomy of individual learners, leading them to greater interaction with teachers and boosting their constructive learning experience using various channels of mobile communication.

In the third paper, Meawad and Stubbs further explore the individual constructive learning space, proposing a generic m-learning framework that provides interoperability with existing learning environments, specifically, computer-based e-learning applications. This paper describes the use of mobile components to extend virtual learning environments and establish a compact and easy-to-use, on-demand, personalised mobile learning space. This pivotal work discusses the critical success factors needed for effective m-learning.

An interesting trajectory for m-learning environments is developed in the next paper, which aims at determining the benefits and challenges of the collaborative learning space provided by mobile technologies. It is argued that participants in a collaborative learning environment can learn equally well from each other as from the teacher or course materials, and that learning is not static subject matter but the process of participating itself. Laine and Suhonen introduce the idea that social network technologies, e.g., blogs and wikis, can be used by learners in the new mobile paradigm. The purpose of social networks in education is to enhance collaboration and interaction between the learners. This seems to be particularly important in distance education where interaction otherwise often occurs only between teachers and students.

Education is now being displaced from its traditional physical territories of schools or institutions by a generalised form of learning that can take place anytime and anyplace with the help of mobile technologies. At the primary school level, Kurti et al. show how this generalised form could be made available in various learning scenarios and how situated learning activities can be realised. This paper displays significant technological innovation characterised by new types of interaction devices and communication technologies that facilitate human-to-human communication in cooperative work scenarios as well as interactive and situated learning activities. When it comes to contextual learning situations in the tertiary or life-long learning environment, the research carried out by Ryu and Parsons, described in the final paper in this issue, provides some practical assessment of using situated and contextual learning support for continuous personal time and task management.

*Change is inevitable in a progressive country. Change is constant – Benjamin Disraeli.*

Mobile technologies have already transformed, and will go on profoundly transforming, education systems. The education sector also faces a paramount challenge in attempting to understand, and indeed to influence, such change. In this special issue, our intention is to disseminate studies about how we can meet the challenges of these technologies, exploit practical experiences of the design of m-learning environments, and further extend empirical research into contemporary m-learning systems. Of course, the work

selected in this issue is still on-going research but it shows a way forward for the design and development of future learning and education systems.

Finally, the editors of this special issue would like to thank the authors for their most interesting contributions, and also the many anonymous reviewers of the 19 papers submitted, for their commitment to the peer review process.

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