Chapter XXI
Mobile Devices to Support Advanced Forms of E–Learning

Alessia D’Andrea
Istituto di Ricerche sulla Popolazione e le Politiche Sociali-Consiglio Nazionale delle Ricerche, Italy

Fernando Ferri
Istituto di Ricerche sulla Popolazione e le Politiche Sociali-Consiglio Nazionale delle Ricerche, Italy

Leopoldina Fortunati
Università degli Studi di Udine, Italy

Tiziana Guzzo
Istituto di Ricerche sulla Popolazione e le Politiche Sociali-Consiglio Nazionale delle Ricerche, Italy

ABSTRACT

This chapter describes changes that mobile devices, such as mobile phones, PDAs, iPods and smart phones improve on the learning process. The diffusion of these devices has drastically changed learning tools and the environment in which learning takes place. Learning has moved outside the classroom becoming “mobile.” Mobile learning provides both learners and teachers with the capability to collaborate and share data, knowledge, files, and messages everywhere and everytime. This allows learners and teachers to microcoordinate activities without limitation of time and space.
INTRODUCTION

Learning, in its most natural form, is the way in which knowledge is acquired by individuals. The diffusion of mobile devices has changed tools and modalities of transmission/acquisition of knowledge and the contextual environments in which learning takes place. Learning has moved outside the classroom into the learner’s environment becoming “mobile”.

Mobile Learning is not a simple extension of E-learning, but “it is often highly dynamic, targeted to the user’s current context and learning needs in respect to e-learning” (Parsons, 2006). Mobile Learning uses advantages of mobile devices (such as mobile phones, handheld computers, personal digital assistants and so on) and permits learners to complete activities in a variety of settings and according to different cadences.

The aim of this chapter is to describe changes mobile devices improve on the learning process. In particular, the chapter introduces a specification of Mobile Learning by describing the different properties of mobile devices. Mobile devices promote the every-where and every-time conversation and collaboration between learners and teachers, enabling them to share knowledge, files and messages. This allows learners to informally acquired knowledge while being away from their computers and classrooms when and where it is convenient for them by using a collaborative approach. However, the use of mobile devices for learning activities presents also disadvantages, the most important concern the technological limitations due to the small screen size of these devices, limitations of the keyboard, difficulty of navigation, limited battery power and little memory storage. Despite disadvantages, there is a growing interest in using Mobile Learning in different contexts of use (e.g., in educational, in business as well as in tourism field). This flexibility of Mobile Learning has determined a growing interest in developing Mobile Learning Systems (MLSs). These Systems permit truly to implement the concept of an anywhere/anytime learning that can enrich, enliven or add variety to conventional lessons or courses. The diffusion of MLSs has promoted the development of a more interactive communication between learners and teachers. However, during the interaction process learners and teachers have different needs and different features. These features produce the need for User Interfaces that are usable, multimodal and personalized to the greatest extent possible for each user. Multimodal User Interfaces support this purpose because they give learners and teachers the possibility to use several modalities such as visual information (involving images, text, and so on) voice or gestures that provide flexible and powerful dialog approaches, enabling them to choose one or more of the multiple interaction modalities.

BACKGROUND

The learning of the future will be characterized by a growing need among learners to access local content and to develop both personal and global knowledge in different social contexts and environments. There are many different situations of learning outside the classroom and the workplace that could employ chunks of knowledge that are produced and shared through social learning experiences. This scenario has been envisaged and supported by several methodological studies and European research projects.

Many methodological studies have shown that a variety of approaches and best practices concerning the use of mobile devices to support learners are being applied, however some of them lack of a sound analysis from a pedagogical and human-computer interaction point-of-view.

The pedagogical point-of-view addresses the process of designing, communicating and presenting new content and learning resources on small devices for different users with different needs in different contexts. These include identifying ap-