Authentic and Situated Learning with the Use of an Adaptive Search Engine and a QR-Code in Mobile Mode

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ABSTRACT

The paper presents a technique of interrogation, in mobile technology, of a knowledge base contained in an e-Learning platform. The query is done through the integrated use of an adaptive search engine (ASE) and QR codes. The QR-Code are used to label objects in real environments of cultural matter (e.g., museums, art galleries, archaeological sites, etc.). These objects can then be analyzed in more detail during a real learning activity (situated learning and authentic learning). The knowledge base of the virtual learning environment (VLE), is interrogated through a mobile device (smartphone or tablet) which, through an appropriate decoder software, interprets the instructions contained in a QR label previously positioned on the object actually observed by the learner (e.g., during a visit to a museum). ASE combines to the data contained in the QR-Code those relating to the user who performs the query (previously recognized via the log-in on the e-Learning platform), therefore, extracts information about the observed object, adapting to the profile of the user-learner. With the help of these tools the learner can expand his real learning experience, while interacting with a virtual learning environment. In this way, situated and authentic learning activities can be upgraded and virtualized, maturing a significative educational experience with the use of intuitive and user friendly digital tools.

Keywords: Adaptive Search Engine (ASE), Authentic Learning, Mobile Learning, Quick Response (QR) Code, Situated Learning

1. INTRODUCTION

Nowadays ICT, and particularly the Internet technology, are part of people daily life. These technologies have given rise to what is now called digital age, where everything is related to communication, the exchange of data and information, and what is most important, culture are carried out by telematic systems.

The human being, therefore, is subject to constant changes imposed by technological evolution, which prompts us to redefine the concepts of time, space and memory, comparing them to a different dimension in which
people acquire information and knowledge continuously; in the meanwhile they produce new knowledge and make it available to others. There is, ultimately, the birth of a new society, called Knowledge Society, that is a natural evolution of the Information Society, which can fully exploit the potential that evolved technology tools, current and in the testing phase, may allow. E-knowledge is the new knowledge paradigm which emerges from the above context (Norris, Mason, & Lefere, 2003). It is clear that, in this perspective, the need for a sound digital literacy imposes to people, so that the opportunities offered by information technologies are accessible to all and for all, focusing attention not so much on technology but on the subjects who must use them, and specifically, paying the utmost attention to the particular class of people who fall into the category of disadvantaged or with disabilities. It is therefore necessary to adopt strategies that make technologies themselves, as well as operating procedures related to human-machine, more flexible, intuitive and user friendly, in that, the individual is the reference terminal; technologies, for people, must be implemented and continuously updated so that they can respond to the changing needs required by the change of social conditions, the acquisition of new and different knowledge and from the continuous evolution of the social cultural level.

These technological transformations, but also socio-political ones, involving the field of education and training, are making significant changes to the way people learn and do training. New technologies, in fact, are increasingly used in the educational process, and the use of telematic networks, in such contexts, characterized by hypermedia forms of communication typical of the web, and the so-called mobile computing, have allowed the large-scale distribution of teaching material that, therefore, can be availed in self-instruction, exceeding those space-time limits which in the past have limited access to informative and educational contents. In other words online learning Environments are the new contexts of training and education. Since all teaching materials (learning objects) can be benefited through hypertext and multimedia forms, it becomes crucial to consider the cognitive user-learner sphere, which interacts with the environment, and therefore it is necessary for the learner that objects are interrelated with his/her cognitive style. Reflecting on what has been said, the current paper starts from the relative invasiveness of the technologies that have changed the relationship that mankind has with the outside world and with knowledge, and from the introduction of new elements which redesign in a completely new way both communication, educational models and distribution of knowledge, but also the strategies and methods of acquiring the same knowledge. It is more and more strong, in fact, the need for the pedagogical-teaching community to address this issue and framing it within a context of accountability and educational communication, since in recent years a special interest in all use of new teaching methods, related to the use of technologies and environments and contexts of learning on the web has been developing (Piu & De Pietro, 2009; Calvani, 2001). It is necessary, and this is what we set out to achieve with our project, to implement human-machine communication interfaces that integrate digital literacy and digital competence. Such interfaces, in addition to the quality of being understandable and usable, recall the concept that Donald Norman (2004) defines as pleasurability; it is a feature which must always be present, also in accordance with our point of view, in any technological environment.

The present work is oriented to the improvement of technological artifacts (Masino & Zamarian, 2003) to support teaching and to implement, in particular, a tool that can support educational activity in everyday de-localized contexts, with respect to traditional learning environment, through the use of mobile technologies and an interface characterized by high usability and flexibility. The educational activity has now taken on a broader and more decentralized function thanks to the help of mobile technologies that have become increasingly more important tools to support e-learning. Mobile learning, in particular, is increasingly
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