



**International Doctorate School in Information and
Communication Technologies**

DIT - University of Trento

**MOBILE LEARNING: WIRELESS AND MOBILE
TECHNOLOGIES IN EDUCATION**

**TOWARDS HOARDING CONTENT
IN M-LEARNING CONTEXT**

by
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The PhD thesis will be submitted to the
International Graduate School of Information and Communication Technologies,
at the University of Trento, Italy
by January, 2006

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ABSTRACT

M-learning is a very new but rapidly expanding domain. Provoked by the fast advances of mobile technologies different applications and systems are developed continuously. Many new research topics are emerging in various areas, including technological issues, pedagogical and methodological ones, problems related to content and user interface adaptation, and etc.

The main goal of this thesis is to address the hoarding problem, which has been previously weakly explored but is a particularly important issue in the mobile domain and whose solution should be included in every system with a large quantity of data. For e-learning systems to be translated into mobile it is generally the case. Hoarding is the process of automatically selecting learning content which has to be prepared and pre-fetched on the mobile device's local memory for the following offline-session. Hoarding is highly needed in the m-learning context for two main reasons. On the first place is the demand to support what is called "any-time, any-place" education. This means that on the mobile device (e.g. a PDA – the kind of device mainly used in m-learning), which might be often disconnected from the Internet, the needed learning content should be available locally for allowing access during the offline periods. On the second place comes the desire to hide from the student the technologies that lie behind this ubiquitous learning. We would like to free the user from tedious operations of manual preparation and planning his/her next study session. Moreover often we cannot even count on student's own judgment for his/her knowledge and future needs.

In order to attack the main problem the full context around the hoarding had to be constructed and is described throughout the thesis. In this sense the thesis appears to be multidisciplinary as it treats also important questions about the construction and evaluation of an m-learning application. We have started with the choice of a concrete area for experimenting in mobile learning and hoarding. The chosen field was language learning and a prototype of a mobile language learning system was built. We discuss the general and concrete approaches to develop and build it. Motivations for our choices are given on every step. We describe in details the hoarding problem and the strategy to solve it with the goal to provide an efficient hoarding solution. Experimental results are presented, together with the practical experiences gathered from the interactions with the users.

Finally suggestions for improvements and further research issues are given.