Chapter 13
Providing Recommendations for Mobile Learning: Opportunities and Challenges from Context

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ABSTRACT
At the interdisciplinary intersection of mobile computing and e-learning, mobile learning is a new paradigm that promises to revolutionize learning by supporting new pedagogical approaches and learning experiences. The unique advantage of mobile learning is to encourage learners to learn in an authentic environment with the help of their mobile devices. In mobile learning systems, recommendation technology can play an important role by providing suitable learning resources to learners according to their interests and preferences. However, the learning needs of learners are dynamically changing as they change their physical location and participate in different activities in the mobile learning environment. Recommendation results cannot reflect actual demands of learners if the learner’s context is ignored. Integrating context into the recommendation process brings along opportunities to better understand the dynamic requirements of learners, but also challenges to constantly improve the existing recommendation mechanism. This chapter aims at providing an overview of these opportunities and challenges.

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INTRODUCTION

Mobile learning refers to “any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies” (O’malley et al., 2003, p.6). Mobile learning is a new paradigm that is expected to revolutionize learning forms by changing the ways of behavior and interaction of learners (Leung & Chan, 2003; Liu et al., 2003; Wang, Shen, Novak & Pan, 2009). At the early stage of mobile learning, learning materials were simply transferred from the previous E-learning systems to new mobile platforms (Cobcroft, Towers, Smith & Bruns, 2006). The main objective was to support learning anytime, anywhere by promoting a more flexible fruition of learning material on the move. Further development of mobile learning allowed to better understand the differences between E-learning and mobile learning. E-learning is suitable for distant education by supporting geographically distributed people to access large amounts of learning materials. Mobile learning is not just a mobile version of E-learning. Mobile learning is not suitable for the distribution of large learning contents due to the limitation of input and output of mobile devices and communication speed of wireless network. Rather, mobile learning can support new pedagogical approaches and learning experiences by encouraging students to leave the classroom and learn in authentic learning environments (Laurillard, 2007; Motiwalla, 2007). In this way, learning can be better integrated into learners’ daily life and practices. Learners can find out what they desire to learn by walking around in the real environment and learn when and where they want. Learners can interact with the environment and collect environmental data with mobile devices and wireless network. Learners can discuss and share ideas with others when they need help.

In mobile learning systems, recommendation technology can play an important role by suggesting suitable learning resources to learners according to their interests and preferences, but also based on their specific situation and the possibilities that it offers. Recommendation technology refers to a type of information filtering system that attempts to recommend information items according to users’ interests and preferences (Prem & Vikas, 2010). On the one hand, recommendation technology can be used in a specific domain to solve the problem of information overload. Mobile learning offers learners new learning experiences by supporting situated learning in local environment and communities. Suitable learning resources, such as learning content, tasks, activities and collaborators, should be suggested to learners in order to improve the satisfaction of learners and the efficiency of mobile learning systems. On the other hand, recommendation approaches should be improved or adapted according to the new requirements of mobile learning. The requirements of learners and the possibilities at their hands are dynamically changing when they move to different locations, take part in different tasks and activities, and collaborate with different partners. The dynamic of requirements challenges recommendation approaches on providing appropriate recommendation to learners. Recommendation results cannot meet actual demands of learners if their current situations are ignored, as in traditional recommendation approaches.

Context can be used to characterize the situations of a learner in a mobile learning environment. Integrating context into the recommendation process means both opportunities to better understand the dynamic requirements of learners and challenges to constantly improve the existing recommendation mechanism. Contextual information can be integrated into the recommendation process in order to understand the actual needs of learners. With the help of context, recommendation approaches can strengthen the advantages of mobile learning through providing suitable learning resources according to learners’ current situations. However, the variability and complex-
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