Mobile Applications as Tools to Support Embodied Learning: Current Practice and Future Directions

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ABSTRACT

Mobile learning (mLearning) is a rapidly expanding area of educational research. Theorists, researchers, and instructional designers are excited about the potential contributions of mobile technology to the field of education. Mobile tools such as Apple’s iPad or Galaxy Tab have sparked this interest based on their ability to provide high-powered computing within a small, extremely portable form factor. Learners are no longer constrained by the desktop or the power cord of a laptop. Unfortunately, much of mLearning research has focused on transferring eLearning on to mobile devices, instead of investigating the unique characteristics of mobile tools that can be used to define mLearning as a distinct type of learning. This paper begins the task of situating mLearning as a distinct type of learning by first considering the theoretical and pedagogical affordances unique to it. Then, the authors transition into a discussion of embodied learning and how the literature related to this field supports the use of mobile tools for educational purposes that go well beyond the deliver of eLearning instructional content. From there, the authors move to a discussion of the logistical challenge of melding mobile tools within formal learning environments. Next, the paper reports the results of an investigation into the current state of mLearning applications and how the majority of these applications fail to leverage the hardware features of mobile tools that can potential result in deeper understanding of concepts and skills. Finally, the authors provide implications and future directions for developers and educators.

Keywords: Education, Mobile Applications, Mobile Devices, Mobile Learning (mLearning), Mobile Tools, Smart Phones, Tablets

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INTRODUCTION

The personal computer serves as an important instructional support tool within the contemporary classroom. Considerable resources have been spent in determining the best practices and pedagogical affordances that support the integration of computers within classroom. Simultaneous advances in mobile networks applications and infrastructure have resulted in the ability to provide exponentially more powerful computer hardware within increasingly portable devices capable of operating in robust wireless networks with stable software mobile applications. The advances being made in mobile computing have opened a new line of research within the domain of instructional technology: Mobile learning (mLearning).

mLearning is still very much in its infancy (Denham, Quick, & Atkinson, 2012). Exploratory research is being conducted to explore if there are benefits that mobile devices provide to learners and the means by which educators can leverage this new technology. A formally accepted definition for mLearning has yet to be accepted, though most existing definitions focus on mobile devices and portability including the ability to learn anytime, anyplace, and anywhere. We feel this misses the underlying educational potential of mobile devices. Instead of focusing mLearning around portability of mobile devices, we consider that mobile learning should consider three key components: mobile devices, software platform, and mLearning applications. We feel that the field should be exploring pedagogical and technological means of using mobile devices as an instructional tool to support embodied learning activities by allowing learners to physically interact with the world in a new approach to learning that is well suited to leverage the affordance of mobile devices and is associated with positive learning gains (Black et al., 2012).

Acquiring knowledge is a complex task but retaining that knowledge on a long-term basis is even more complex. By acquiring knowledge in embodied learning environments that map to real world contexts, we are able to provide learners with instruction that they will find useful, relevant, and more likely to support retention of knowledge. Facilitating learning through embodied learning activities requires the creation of environments that map concepts and procedures within real world settings. This may require instruction to take place outside of the formal classroom, within informal learning environments where students will be able to better embody their learning while receiving real-time support. Current educational technology tools, such as intelligent tutoring systems, require students to be sedentary during the instructional process. The rapid hardware and software improvement in mobile devices points to their ability to provide a distinctly different form of learning that leverages their affordances to support embodied learning activities. The challenge lies in providing the same level of instructional support found in well-established educational technologies while simultaneously establishing mLearning as a distinct theory of learning.

Within this paper we will discuss the theoretical and pedagogical affordances of mLearning and embodied learning. We will also discuss the technical challenges associated with the integration of mobile networks applications within instructional settings. We will provide a snapshot of the current state of mLearning applications available to learners and educators. This discussion will contain a detailed snapshot of the most popular existing mobile applications that have attempted to leverage multimodal mobile device hardware to provide learning activities. Finally, we conclude describing the tasks that must be accomplished by educators and application developers in order to advance mLearning as a new view of learning.

mLEARNING

Recent rapid advances in the capabilities and affordability of mobile devices have piqued the interest of educators and instructional designers. Their appeal lies in part in the growing ability of mobile devices such as smartphones and tablets...