Mobile Technology and Student Learning: What Does Current Research Reveal?

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ABSTRACT

As mobile devices become ubiquitous, it is necessary to analyze if and how these devices can be used for learning. This systematic review is part of a larger review that analyzed 21 mobile learning research studies published from 2005-present. Eleven studies that focused specifically on student learning outcomes and processes are summarized in this review in order to better understand the direction of mobile learning in mainstream education. Overall, studies were found to be positive and indicated several benefits of using mobile devices for learning including an increase in achievement, productivity, engagement, and motivation. This paper also highlights recommendations for future research and practice in the field of mobile learning, specifically focusing on the way personal mobile device ownership may influence learning both inside and outside the classroom.

Keywords: Education, Literature Review, M-Learning, Mobile Devices, Mobile Learning

INTRODUCTION

Technology in today’s modern society is constantly evolving at a rapid pace. Tech savvy consumers are demanding access to information and instantaneous communication on portable devices to keep up with a growing mobile society. Users are performing various tasks on their mobile devices including those related to work, play, communication, and socialization. This extreme growth in the capabilities of mobile technology in combination with increasing affordability has led to the acknowledgement of a ubiquitous learning tool by various researchers and educators in both K-12 and higher education. Though since its inception much work has been done to define mobile learning and discuss specific challenges of pedagogy, the majority of primary studies have flourished in the last five years due to the transformation of mobile learning from a subsidiary of e-learning (i.e. mobile e-learning) to its own field (Traxler, 2009). As non-traditional methods of education become more prevalent and thus, informal and flexible learning environments become necessary for students in an ever-connected society, research of m-learning will play a significant role in determining if institutions can support 21st century needs (Fetaji, 2008).

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Background and Prior Reviews

Because m-learning research is still in its infancy, the amount of available primary research studies is still, relative to other fields of study like e-learning, small. Most literature reviews and conceptual papers seek to establish a foundation for m-learning, develop theory, or focus on design. Specifically, prior reviews and papers have focused on the type of m-learning projects being done (Fetaji, 2008), the nature of research questions (Ali & Irvine, 2009), and the type of activities that can be supported with mobile technologies (Naismith et al., 2004).

Yet, there are still many questions to consider about mobile learning research. While the topics summarized in other reviews have undoubtedly added to the field, there is a lack of research that specifically focuses on student learning outcomes and processes.

Purpose

The goal of this review is to enable researchers to identify current research practices in order to understand the current direction of mobile learning and further research in this growing field. This systematic literature review will summarize, evaluate, and explain the research applicable to understanding learning outcomes and results of recent mobile learning studies.

This review is part of a larger systematic review that examined three research questions: 1) What type of m-learning research is currently being done? 2) What are the student learning outcomes and processes? 3) What are student perceptions of m-learning?

The results in this paper focus specifically on the second research question. Eleven studies out of the 21 reviewed examined learning in some way. Thus, we analyze these in this paper in order to understand the type of learning that is being done with mobile technologies and the outcomes and benefits of those processes. Researchers paid particular attention to the type of technology used, the interaction that the technology was used to support, type of learning task, benefits of the intervention, the outcome measured, and the results of the study. Recommendations for further research have been made based on an analysis of the studies and the suggestions provided in studies included in this review.

METHODS

Inclusion and Exclusion Criteria

Studies that examined attitudes and achievement associated with mobile learning in a variety of different contexts were selected for this literature review. For the purpose of this study, we used Ally’s (2009) definition of m-learning which describes m-learning as the process of using a mobile device to access and study learning materials to communicate with fellow students, instructors or institution (Ally, 2009; Ali & Irvine, 2009). Although there are a plethora of mobile devices that can be considered, we limited our review to personal mobile devices, specifically PDA’s, mobile phones, and mp3 players, used for either formal or informal learning or as part of practical work experience or practicum. It should be noted that while we have recently seen a convergence of these devices into one multi-functional device (i.e. smartphones), some of the research was done prior to this convergence. Thus, we label the device as it was referred to in the original study. We specifically selected the mobile phone, mp3 player, and the PDA for investigation because these are the devices that most smartphones can now all function as. These devices are also personally owned and able to be used by students for learning. This “personalization” factor, which is related to ownership, has been linked to intrinsic and extrinsic motivation, which may lead to positive learning outcomes and enable the growth of mobile learning in education (Sharples, 2006; Yordanova, 2007). We have excluded studies that use handheld devices (i.e. student response clickers) that cannot be used independently outside of a classroom. These devices often function by using software located on a central computer usually belonging to the instructor and have no function outside...
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