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## A Library and the Disciplines: A Collaborative Project Assessing the Impact of eBooks and Mobile Devices on Student Learning<sup>☆</sup>

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## ABSTRACT

With the proliferation of technology usage, it is essential to understand the effect of implementation of technology in the academic setting. Specifically, this article examines the impact of eBooks and mobile devices on student learning. A pilot study was conducted with three areas of interest. The first question of interest found that owning or having access to two or more mobile devices significantly increased respondents' frequency of accessing eBooks. The second question examined the pros and cons of using mobile devices. Accessibility and cost savings were found as pros; while functionality and pedagogy were reported as drawbacks to mobile device usage. Furthermore, usability responses varied. The third question examined the effect of mobile device use on student learning. Findings show that eBooks and mobile device use in the classroom have a significant impact on the student's educational experience.

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## INTRODUCTION

Since fall 2010, Boise State University, a university of 22,000 students, has actively engaged in exploring innovative strategies using eContent (resources available electronically) and mobile devices in student learning (Shadle, Perkins, Lincoln, Humphrey, & Landrum, 2013). Albertsons Library, the School of Social Work, and the Provost's Office collaborated on a pilot project investigating the use of eBooks and mobile devices among social work students. In year two, the School of Nursing and nursing students joined the study. This collaborative pilot project was designed to investigate the impact of eBooks and mobile devices on student learning both quantitatively and qualitatively. The pilot project sought to answer three research questions:

1. Will the use of mobile devices affect students' access to library resources, especially eResources?
2. What pros and cons are there in using mobile devices?
3. How might the use of mobile devices affect student learning?

The project focused on purposefully embedding library eBooks into the student learning experience. Students were provided with mobile

devices for accessing eBooks and other curriculum support materials. An integral component of the pilot study included ready access to eBooks and other electronic information resources (eResources). In order to investigate the impact of eBooks and mobile devices on student learning, discipline-specific social work and nursing titles were acquired by the Library. Additional eResources ranging from handbooks, manuals, dictionaries, encyclopedias, to streaming media provided curriculum support for social work and nursing students. Library eBooks were made available through the online catalog and selected eBooks were also accessible through the Social Work and Nursing library research guides (LibGuides™ <http://guides.boisestate.edu/socialwork>; <http://guides.boisestate.edu/nursing>). The library research guides highlighted other eResources such as streaming media, online databases, and eJournals. Students and faculty in both programs were already actively using the discipline-specific library guides as a starting point for their library, information, and research needs.

A variety of mobile devices were considered for use in the pilot project – iPads, Kindles and other eReaders, and netbooks, and their features and functionality were evaluated. An internet browser, the ability to view documents, and the capability to support multiple eBook software platforms were mandatory on project mobile devices. Amazon Kindles were excluded from the project due to the Arizona State University lawsuit about visually impaired students' accessibility issues with that device (Barron, 2011). Accessibility features of possible mobile devices were also carefully considered. Project staff selected Apple iPad 1s and HP mini 2012 netbooks as the devices distributed to student participants at the beginning of each class for a semester-long loan. Although the 2012 *Horizon Report* (Johnson, Adams, & Cummins, 2012) separates

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tablets from other mobile tools by limiting mobile to hand-held, call-making devices and makes a distinction between tablets and tablet computers, for purposes of this project, mobile devices refers to tablets and netbooks.

## LITERATURE REVIEW

Wifi, the proliferation of electronic reference, information, and academic resources, new devices and technologies, and curriculums incorporating active student engagement have all coalesced around mobile learning. According to Morris and Maynard (2010), access to information anytime, anywhere is the defining characteristic of 'mobile.' This literature review summarizes the mobile and supporting technological evolutions first and then using the three research questions, investigates the integration of mobile learning, mobile devices, and eBooks among nursing and social work students.

Beginning in 2002, the Higher Education *Horizon Report* (hereafter *Report*) annually shares emerging trends and technologies predicted to impact colleges and universities in the coming years. The 2005 *Report* (New Media Consortium & National Learning Infrastructure Initiative [NMC], 2005) features commentary on rising handheld device functionality, increasing access to the Internet, and proliferating ubiquitous wireless. In 2006, the *Report* (NMC, 2006) states: "[m]obile and personal technology is increasingly being viewed as a delivery platform for services of all kinds" (p. 3) and "phones in their pockets" (p. 5) as a technology to watch. The 2007 *Report* (NMC, 2007) notes "increasing demand by students for instant access and interactive experiences" (p. 3), and the "growing expectation to deliver services, content and media to mobile and personal devices" (p. 5). In 2008, the *Report* (NMC, 2008) recognizes that mobiles are an "affordable portable platform" (p. 2) for connecting and forecasts a growing demand for mobile content. The Amazon Kindle eBook reader is mentioned for the first time.

The 2009 *Report* (Johnson, Levine, & Smith, 2009) for the third year labels mobiles, primarily mobile phones, as a trend to watch. The opportunity for higher education to reach out and connect using mobile content is listed as a critical challenge. Mobiles are placed on the time-to-adoption horizon of one year or less and reference and reading materials highlighted as accompanying educational applications. The 2010 *Report* (Johnson, Levine, Smith, & Stone, 2010) comments on netbooks (or tablet computers) as a portable tool for learning and notes that eBooks are connecting with consumers for general reading but identifies availability, illustration limitations, and publishing of academic titles as obstacles. eBooks and mobiles make the 2011 *Report's* (Johnson, Smith, Willis, Levine, & Haywood, 2011) technologies to watch list and the Apple iPad is mentioned as representing "a new class of tools that merges the utility of electronic book readers with web browsing" (p. 8). Also discussed is the transition from eBooks being simply a reproduction of print titles to evolving into a learning experience that optimized the features and functionalities of tablets. The educational opportunities interactive eBooks make possible are cited.

The 2012 *Report* (Johnson et al., 2012) identifies active classroom learning and applications available on tablets as allowing students to connect the curriculum to real world experiences and issues. However, effectively using technology tools to engage with students is recognized as a challenge too. The 2013 *Report* (Johnson et al., 2013) expands on tablet computing as a technology to watch and focuses on device portability and "WiFi and cellular network connectivity" as promoting "learning inside and outside of the classroom" (p. 4) and features ways faculty are using tablets to enhance the curriculum.

*Will the use of mobile devices affect social work and nursing students' access to library resources?* Nursing and health care education were early adopters of using mobile technologies to connect students with information resources (Parsons, 2010). Boruff and Storie (2014) speak about mobile device adoption and use as a reference tool to locate medical care and drug information and find and read journal articles. With mobile technologies, students participating in clinical discussions are

able to use real time access to diagnostic and medical information to inform patient care (Kenny, Park, Van-Neste-Kenny, Burton, & Qayyum, 2012). Lombardo and Honisett (2014) confirm the educational value of mobile devices as "useful for finding information quickly, especially when using medical reference, drug references, medical textbooks, and Pubmed" (p. 18). Although, Cooner's (2004) article in *Social Work Education* took an early look at incorporating advances in technology into social work education, there are no recent articles about teaching or learning with mobile devices in the social work literature.

*What pros and cons are there to using mobile devices?* Mobile device use depends upon a number of factors. These include: the availability of a wireless Internet connection; reliability of the connection; purchase and maintenance costs of mobile devices; ease or difficulty of use; and comfort, or trouble, with eBook access and reading. West, Hafner, and Faust (2006) identify mobile device benefits of portability and ease of use with browser internet access. Parsons' (2010) study found that internet and wireless connections and easy access to information were key reasons in students using mobile devices for education. Boruff and Storie (2014) cite discovery of, and access to, full-text journal articles and license authentication protocols as barriers to use.

As Morris and Maynard (2010) highlight and Lippincott (2010) emphasizes, in order to be truly mobile, devices need data plans. Kenny et al. (2012) include discussion about who should be responsible for paying for data plans while Lippincott (2010) asserts that the provision of data plans is outside of the scope of library services. Hahn and Bussell (2012) note that students may be unwilling to pay data plan costs.

In the Parsons (2010) study, only 8% of respondents identified mobile device purchase cost as a deciding factor for educational use. On the other hand, students encountering technical difficulties tend to stop using mobile devices (Taylor et al., 2010). According to Tees (2010) the main barrier to eBook acceptance is difficulty reading from the screen. A tablet's size, screen resolutions, and Internet access facilitate accessing information, viewing images, sharing content, and supporting student field- and lab-work (Johnson et al., 2012).

*How might the use of mobile devices affect student learning?* Ituma (2011) finds that mobile learning is active learning and the accompanying student engagement may foster an enriched learning environment. Mobile devices support learning by providing a reading experience where multimedia and collaborative elements can be incorporated (Miller, 2012). Student learning may be impacted by bringing faculty, students, and information resources together inside the clinical setting (Kenny et al., 2012). The 2012 *Horizon Report* (Johnson et al., 2012) cites numerous college and university studies where using tablets to engage with the curriculum "increased student engagement and enhanced learning" (p. 15).

Other university research projects have also explored integrating mobile devices or eBooks into the curriculum. Gikas and Grant (2013) examined students' perceptions of integrating mobile devices and social media interactions in three United States universities. Granado, Colmenares, Perez, and Catalodo (2013) researched using wifi and mobile devices to monitor and change laboratory hardware remotely and to complete laboratory practice when unable to access the physical facility. Martin and Ertzberger (2013) compared computers and mobile devices as learning tools in instructional design and technology courses. Viberg and Gronlund (2013) researched mobile technology in second and foreign language learning in China and Sweden. Ahmad and Brogan (2012) studied academic eBook use from the library perspective. Czechowski, Folb, and Wessel (2011) surveyed eBook usage by health sciences faculty and students.

## METHODOLOGY

The pilot project assessment examines the three questions detailed in the Introduction. This study collected data over two academic school years and utilized two research tools: self-report pre/post surveys and in-person focus groups. Student participation in the pilot project

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