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Higher Education and Emerging Technologies: Shifting Trends in Student Usage

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ABSTRACT

This study serves as an update to a previous study by Sam Houston State University librarians about the use and preferences of Internet, communication, and educational technologies among students. Since the previous study was initiated in 2010, the iPad has made its debut and significantly altered the educational technology landscape. In this new landscape, this study investigates student usage of such technologies as instant messaging, cell phones, e-readers, social networking, RSS feeds, podcasts, and tablets. In addition, this study aims to determine which technologies students prefer the library to utilize for a variety of services, such as reference assistance or book renewals, and which technologies may not be worth the investment, such as geosocial networking. The information gained from this survey is intended to provide guidance for libraries looking to provide services utilizing the most popular technologies with the most efficient use of resources. Survey results show an increasing use and dependence on educational technologies and a desire for basic library services to be available on a variety of platforms and technologies.

INTRODUCTION

In 2010, Sam Houston State University (SHSU) librarians initiated a study published the following year in *Reference & User Services Quarterly* titled "Higher education and emerging technologies: Student usage, preferences, and lessons for library services" (Cassidy et al., 2011). Since the time of that study, the iPad has made its thunderous debut, significantly altering the educational technology landscape by becoming a major player in the field and opening the door for other tablet computing technologies. As a result, an updated survey was developed to more closely represent SHSU students' usage of Internet, communication, and educational technologies in this new landscape.

In addition to exploring students' interaction with such technologies as instant messaging, cell phones, e-readers, social networking, RSS feeds, podcasts, and tablets, educators and librarians are pressing beyond a surface exploration of digital content in order to capitalize on the idea of continuous instant access and active engagement with learning afforded through the use of mobile devices. This study is intended to provide guidance for such issues by surveying student library users' utilization and preferences of Internet, communication, and educational technologies at SHSU. SHSU is a Carnegie Research Doctoral university located about 1 h north of the Houston metropolitan area, and is made up of a large number of commuter, first-generation, or otherwise "non-traditional" students. With such a diverse student population, this survey set out to acquire as much information about SHSU students' educational technology usage in order to provide the most efficient and highest quality library services where they are most needed and desired.

LITERATURE REVIEW

The idea of mobile learning, or *m-learning* (El-Hussein & Cronje, 2010; Sharples, Taylor, & Vavoula, 2007, p. 222), is not necessarily new—it has been waiting in the wings since e-learning made its first stage appearance—but its pairing with the recent influx of smart technology devices has certainly fueled m-learning's popularity. Early on, the term *smart* was often paired with devices such as phones and portable tablets that functioned "like a small, networked computer," enabling users to access Internet browsers and e-mail; more recently the term is paired with phones and portable tablets that provide additional software features or operating systems (OS) which enable the installation of mini-software applications, or apps (Zheng & Ni, 2006). These apps themselves can provide a wealth of educational interaction with the target app's subject content, including games, quizzes, audio, and visual display of malleable content. The mobility of these devices means that students are now engaging with learning content in brief spurts, on-the-go, in the hallway, during lunch, and even the classroom itself. This smart technology is "changing the ways we consume, distribute, and create information" (Little, 2011, p. 267).

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In the interest of exploring how these new mobile devices are being used by the student population as a whole, several national anchor studies feature prominently in this literature review in order to give a baseline comparison for individual university study projects. The anchor studies for this review include the *NMC Horizon Report: 2013 higher education edition*, the *ECAR study of undergraduate students and information technology, 2012*, the *Pearson Education Students and Tablets Survey 2012* (*Summary of findings* and the *Topline results*), and several Pew Research Center reports, including *The rise of e-reading* (2012), *Teens, smartphones & texting* (2012), and *Younger Americans' reading and library habits* (2013).

Individual university studies relating to student technology include results from a 2011 survey at Utah State University (USU) and a 2012 survey at the University of South Carolina Columbiana campus (USC). For comparison purposes, SHSU is classified by the Carnegie Foundation as a public Carnegie Doctoral Research University; it is located in semi-rural Huntsville, Texas, and offers around 136 undergraduate and graduate degrees (Sam Houston State University, 2013). USU is classified by the Carnegie Foundation as a public Research University (high research activity); it is located near mountainous Logan, Utah, and offers around 203 undergraduate and graduate degrees (Utah State University, 2013). USC Columbiana is also a Carnegie-labeled public Research University (high research activity); it is located in Columbia, South Carolina, and offers a total of 324 undergraduate and graduate degrees (University of South Carolina, 2013). All three institutions are large four-year universities located in primarily nonresidential settings offering similar undergraduate instructional programs with high or very high enrollment profiles; student populations reported to Carnegie reflecting data from 2008 to 2010 show SHSU with 16,772 students, USU with 15,512 students, and USC Columbiana with 28,482 students (Carnegie Foundation for the Advancement of Teaching, 2013).

SMART TABLETS

Since the publication of the original SHSU technology survey (2011), the availability of smart tablet technology has exploded onto the student stage, irrevocably changing perceptions and expectations of interactive touch-screen technology. The *New Media Consortium (NMC) Horizon Report: 2013 higher education edition* also identifies smart tablets as "not a new kind of lightweight laptop, but rather a completely new technology" (Johnson et al., 2013, p. 16) and reveals that they are being used as "a portable personalized learning environment" (p. 15).

The 2012 *Pearson Foundation survey on students and tablets* indicates that "[t]ablet ownership has more than tripled among college students since March 2011, with one-quarter of students now owning a standard tablet" (p. 2). While this study was broad in scale, surveying 1206 college students between the ages of 18 and 30 enrolled in a two-year college, four-year college, or graduate school, the popularity of smart tablet technology is difficult to argue. This same study also indicates that "tablets are just as valuable for educational purposes as they are for personal entertainment" (p. 2).

USU's 2011 survey collected data regarding students' use of mobile technology, specifically iPads, from 3074 students, approximately 11.9% of the USU's 2011 total student population of 25,767 (Dresselhaus & Shrode, 2012, p. 87). Of these 3074 students, only 3.9% indicated daily use of an iPad (p. 88). While iPads were perhaps one of the most visible smart tablet technologies early on, iPads are not the only, and certainly not the most affordable, smart tablet technology to which students have access.

USC's 2012 e-mail survey collected data regarding technology brought to campus, including smart tablets known as iPads, from students living in residence halls (graduate and undergraduate), from 1124 students, or just over 16% of the total resident student population of 6647 (University Housing, University of South Carolina, 2012, p. 1). Of these 1124 students, 18% "brought an iPad or other tablet machine to the campus" (p. 2).

MOBILE PHONES

Smartphones are an increasingly popular substitute for smart tablets. The Pearson Foundation's (2012) *Survey on students and tablets* indicate that 65% of college students surveyed indicate that they have a smartphone (p. 5). The *ECAR study of undergraduate students and information technology, 2012*, though focused on undergraduate students, reports that 62% of undergraduates report owning a smartphone (Dahlstrom, 2012, p 14).

Along the same lines of popular technology adoption, USC's 2012 e-mail survey collected data regarding technology brought to campus by undergraduate and graduate students living in resident halls. From the 1124 students polled, approximately 79% indicate that they have a smartphone, with 21% indicating that they did not have a smartphone (University Housing, University of South Carolina, 2012, p. 3). USC's survey was specific to the campus resident population, but it does echo the high adoption rate indicated in the 2012 *ECAR* study.

USU's 2011 survey also collected data regarding students' use of mobile technology, including smartphones (Dresselhaus & Shrode, 2012). Of the 3074 student respondents, 39.3% indicated daily use of a smartphone with Internet access (p. 88). While the overall numbers are lower than the *ECAR* study, USU focused more on the amount of daily use of the smartphone rather than simple ownership or possession.

Of interest also is the Pew Research Center's March 2012 report on *Teens, smartphones & texting* and its June 2013 *Younger Americans' reading and library habits*. While these Pew studies do not directly involve this project's current students, it does examine device ownership of the potential university student population at a national level: teenagers within the age range of 12 to 17. In 2012, approximately "one quarter (23%) of teens 12 to 17 indicate that their phone is a smartphone, while 54% have a regular phone (or are not sure what kind of phone they have), and another 23% of teens do not have a cell phone at all" (Lenhart, 2012, p. 7). Conversely, in 2013, approximately 93% of teens 16–17 years of age own a cell phone, with 63% reporting smartphone ownership: this same report indicates that 94% of college-age adults from 18 to 24 years old report ownership of a cell phone, while 65% indicates ownership of a smartphone (Zickuhr, Rainie, Purcell, Madden, & Brenner, 2013, p. 13). This information may be of interest in analyzing trends in smartphone ownership among current and future college students.

E-READER DEVICES

Another popular mobile technology option for students is the e-reader, a device specifically dedicated to the reading of e-books. Common options of e-readers include early generations of Amazon Kindle and Barnes & Noble NOOK, as well as the Sony Reader. In examining technology trends for students, some distinction is necessary to differentiate e-reader devices from smart tablets. Early distinctions typically included the limitation of a black and white display such as those found in the early Kindle and NOOK, as well as screen size, with tablets having larger displays than e-readers. However, with a continually evolving line of e-book technologies, smart tablet and e-reader hybrids are becoming more widely available (Tablets, e-book readers, 2011); distinctions become even more unclear as smart tablet display screens shrink for better mobility while e-readers and smartphones enlarge their screens for better visibility (Kim, 2012).

According to Pew's 2012 *The rise of e-reading* report, approximately 19% of adults age 18 and older own an e-book reader (Rainie, Zickuhr, Purcell, Madden, & Brenner, 2012, p. 32). Interestingly, this is the same percentage of adults age 18 and older who own a tablet computer. The report also shares an additional correlation that may interest technology researchers: "tablet users and e-reader users are more likely to own cell phones, desktops, tablets, and e-reading devices" (p. 32). An alternate interpretation of this statement is that individuals who own a smart tablet or e-reader device are more likely than those who do