Impacts of Mobile Computing and Communication on Library Instruction

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Faced with an out-of-date information skills tutorial, a comprehensive library web site revamping, and a three-year building renovation project, the library instruction division decided to take advantage of the spirit of change present in our organization to help us rethink our approach to developing online resources. Discussions in library instruction community and the broader educational technology community sparked numerous ideas, and we needed to determine where to prioritize our efforts. Keeping a user-centered approach in mind, we examined the latest trend reports and information behavior literature for insight into what technologies students are using and how they are using them. Based on this research, we developed a pilot study in order to test our assumptions about students' access to and use of mobile computing and communication technologies. The findings helped us to focus our efforts towards developing instructional resources that we believe will be most effective and useful for our students.

Background

It's not an exaggeration to say that the internet has changed almost everything. By now the characteristics of the "net-gen," "next-gen," or "millenial" generation are familiar to most educators. We are expecting our future students to be format-agnostic, nomadic, collaborative, adaptive, used to multitasking, and to be leading lives integrated with technology (Dede, 2005; Holliday & Li, 2004; Lippincott, 2005). On the technology front, the current New Media Consortium Horizon report (2006) tells us to expect social computing and personal broadcasting to meet critical mass within the year, that broader uses of cell phones and educational gaming are close behind, and that we can look forward to context-aware devices within five years. Futurists such as Howard Rheingold (2002) have demonstrated that current technological innovations influence cultural paradigms. For example, flash mobs have organized across the world via text messages to facilitate political activism. Bloggers influence everything from political campaigns to the latest *American Idol* contestant. Current events are often first reported at the "street-level" as in the case of the 2005 London bombings, the first reports and images of which were transmitted from witnesses on the street via mobile phone. The interplay between new communication channels and new information is of particular interest to information science. Such a dynamic environment causes the concept of information literacy itself to take on new dimensions. How best to "teach" information literacy is a perpetually challenging question.

Lippincott (2005) offers several ways for library instruction to adapt to new technologies and the "new" students who are being educated in an internet-centric world. First, she recommends thinking about information like students do, as typically available anytime and anywhere (57). She advises librarians to look at how and when students access information, stating, "One-on-one services offered electronically should be tailored to students' characteristics, such as their propensity to work late hours and use a variety of technologies, including laptops and cell phones" (58). Lippincott mentions blogging, gaming, and pervasive multimedia as key trends to consider and stresses the need to develop more visually sophisticated instructional content.

Technology trend reports generally support Lippincott's assertions. The Pew Internet and American Life project studies the social effects of the internet on Americans and keeps longitudinal data about the adoption of the internet and related technologies over time. As of April 2006, the project reports that 73% of all adults use the internet and that 88% of adults between the ages of 18-29 do. The most popular online activities are email (91%), using a search engine (91%), and finding directions (84%). More than half of internet users do research for school or training (57%), access audio or video online (56%), or do job related research (50%). Emerging activities include taking virtual tours (45%), instant messaging (37%), photo sharing (34%), and online gaming (31%). Podcasting, blogging, and file sharing were activities of less than 30% of adult internet users as of mid-2005.

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Pew's more focused look at how internet use differs between men and women found that "Men go online in greater numbers than women for a vast, but scattered array of other activities. Women outpace men for a small number of activities" (Fallows, 2005, ii). The study also found that more women than men use email to communicate and that, in general, men tend to be more aggressive consumers of online information (iv). Men are also significantly more likely to be familiar with the latest technological trends, try new gadgets and software, and be confident about themselves as "searchers and geeks" (v).

The project's look at teens and technology suggests that these trends are likely to change significantly. Lenhart, Madden, & Hitlin (2005) sum up the findings of their study in its title: "Teens and technology: Youth are leading the transition to a fully wired and mobile nation." Eighty-seven percent of teens use the internet and 51% use it daily. In significant contrast to adults, 81% of teen internet users play games online and 75% use instant messaging, the majority of those on a daily basis (i). Girls between the ages of 15 and 17 were found to be internet power users, surpassing boys their own age and younger boys and girls in their level of internet use and engagement (v). Among teens there is no perceived gender gap between girls and boys with regards to comfort with internet technologies.

Methodology

Given the fact that our primary users, current undergraduate students, probably exhibit characteristics of both adult and teen users, we wanted to test some of the national Pew Internet and American Life project findings with our local population. We developed a short online questionnaire to find out how often our students use certain mobile devices and internet technologies. A pilot sample of undergraduate students was invited to complete the questionnaire via an email invitation from their writing instructor. Students in required undergraduate writing courses were targeted in order to poll a representative sample of undergraduates from all colleges. Participation was not required and a drawing for a bookstore gift certificate was offered as an incentive to complete the questionnaire. As a pilot study, the questionnaire was designed to surface general trends to follow up with more formal research.

Summary of Findings

Out of 32 total respondents, 53.1% were male and 46.9% female. The mean age of respondents was 19 and respondents identified themselves as majoring within nearly every college at the university with 18.8% identifying as undeclared. This initial sample, though small, is demographically representative of our undergraduate population.

Respondents were asked to rate their use of the following mobile electronic devices: mobile phones; digital and digital video cameras; digital audio players; desktop, laptop, tablet, and handheld computers; text messaging devices; GPS locators; personal and console gaming devices; and smart watches. Respondents were most likely to use mobile phones (87.5%), desktop computers (78%), laptop computers (59%), digital audio players (56%), and digital cameras (53%). Respondents were least likely to use GPS locators and smart watches.

With regards to social internet technologies, respondents were given a set of statements about blogs, multimedia file sharing, online gaming, and participation in online communities and were asked to respond *Yes*, *No*, or *Don't Know* to each statement. Respondents were most likely to download music or audio content from an online service such as iTunes (62%), visit a virtual community website such as MySpace (50%), and listen to audio or video broadcasts on a computer (46.8%). Respondents were less likely to regularly read blogs (28%) or play multiplayer online games (6%). When asked if they would be interested in having course-related information provided as either RSS feeds or audio broadcast, only 12.5% were interested in receiving course support via RSS, but 78% expressed interest in downloading course-related audio content to a computer or digital audio player.

Discussion and Questions for Further Analysis

The most significant finding was respondents' strong use of electronic devices and internet technologies for accessing audio content. Although no respondents reported using a mobile phone to listen to music, 50% of those with a digital audio player report using it daily and 70.6% of laptop owners say they listen to music on their laptops. Our findings demonstrate that a majority of respondents are comfortable with finding, accessing, and downloading audio files from the internet. Given respondents' stated interest in having course-related audio content available, this presents a key area of focus for developing new library instruction resources.

Given their pervasiveness, mobile phones also present a key technology instruction librarians might consider in developing new resources and programs. Mobile phones present interesting challenges for educators and libraries. The Qualifications and Curriculum Authority which monitors testing standards in the British school system recently reported that cheating on exams has risen by more than 25% and that mobile phone related cheating accounted for 25% of total offences (Castle, 2006). Librarians are often divided on the use of mobile phones in libraries, but phone friendly libraries are becoming more common and phone and text messaging reference as well as classroom polling via phone are all being explored in libraries and library instruction. Fifty-six percent of our respondents use their mobile phones for text messaging and, while text messaging might not be an appropriate communication medium for extended reference service, it is a prevalent communication tool to consider when thinking about library services.

In spite of recent interest in online gaming as a potential model for library instruction, our findings did not support a need for an immediate educational gaming strategy. Fifty percent of respondents reported owning a console gaming device, but only 21.8% reported owning a personal gaming device. Interestingly, among our respondents women were slightly more likely to own personal or console gaming devices then men, but this survey did not collect usage statistics for these devices. As stated previously, online gaming is not a primary activity of our respondents; however, the impacts of gaming, especially multiplayer online gaming, are not to be completely discounted. The

Pew Internet and American Life Project reports that 81% of internet users between the ages of 12 and 17 play games online compared with 54% of users age 18-28 and only 37% of users age 29-40 (Fox & Madden, 2005). Gaming trends and the impact of gaming on social and cognitive behavior are issues to watch for the soon incoming "digital natives."

Respondents showed significant participation in online communities in general by both maintaining their own spaces (46.8%) and visiting other peoples' spaces (50%), but reported only minimal participation in higher education specific spaces (21.8%). The library blogosphere has recently speculated about the value of setting up library services in virtual communities, but it is important to consider not just how often students use these spaces, but also how they use them. Would students welcome the academic library's presence in all facets of the online world, or resent the infiltration of "authority" into a largely informal and social space? Brian Mathews, a librarian at Georgia Tech has started mining student blogs for keywords such as *assignment*, *help*, *librarian*, and *paper* that alert him to possible reference transactions. He then contacts students through their blogs or email. Mathews reports that students have been "receptive" to his "intrusions" and that they view him as "an equal participant, rather than as an intrusive outsider" (2006). The use potential of this type of librarian-initiated contact, while proactive and perhaps welcome, requires more research into students' expectations and willingness to participate. Our respondents expressed a lack of interest in receiving course-related content via blogs and RSS feeds. Further research is needed to follow up on the reasons for this preference.

Looking Ahead

Based on our findings we are focusing on developing audio content to support library instruction. We are currently developing audio tours aimed at specific audiences of students including new graduate students and students enrolled in first-year writing classes. An LSTA grant was secured to purchase several video iPods to circulate for students who do not have digital audio players of their own. We are considering how else audio content might support library instruction, including podcasting research tips and tricks, and audio clips throughout the library website. The library can also take an active leadership role in promoting the educational use of this technology on campus by having a comprehensive copyright policy that includes audio files and also by helping faculty to access or create multimedia content for their courses.

The percentage of our respondents who are blogging corresponds with Pew findings for the U.S. adult population. Only 28% of our respondents reported reading blogs regularly and only 3% use an aggregator such as Bloglines to organize their blog reading. 81.3% responded that they either did not want course content delivered via RSS or didn't know. Although respondents did not express a preference for receiving course content via RSS feed, this remains a technology to watch, especially since it is inexpensive and easy to integrate.

The pilot study was helpful in showing us where to focus our immediate efforts and for helping us to define questions for further research. Future research will include conducting focus groups with specialized groups of students and a revision of our pilot study survey with continual implementation in on going years to measure change. In addition, as we begin to implement various technology solutions and library instruction, we will perform outcome based assessments. As we evaluate the results of our studies, we must keep in mind that students with various learning styles may be benefited or inhibited by the choices we make.

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