Curricular Use of the iPad 2 by a First-Year Undergraduate Learning Community

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Abstract

Chapter 7 of Library Technology Reports *(vol. 48, no. 8) "Rethinking Reference and Instruction with Tablets" reports out the results of an original research study that investigated how a first-year undergraduate learning community at the University of Illinois made use of an iPad 2 as part of their first-year course work. The study reports on data from two instruments: 1) the students completed an online Web-based survey and 2) also shared their curricular use of the iPad 2 through focus groups. Findings show that there are curricular uses of the iPad 2, particularly for in-class use, that allow students to connect with course-specific content such as their course management site for taking online quizzes and for class outlines and other lecture material; additional course uses of the iPad 2 by students are reported.*

About the Authors

Jim Hahn's research into technology-enhanced learning investigates developing mobile computing applications within library settings and provides unique insights into new students' expectations and needs while helping inform the work he does as the orientation services and environments librarian for incoming undergraduate students at the University of Illinois. As an extension, his research also includes the investigation of technology loan programs in the Undergraduate Library.

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Introduction

Mobile technologies like the iPad 2 are profoundly impacting the way students communicate and learn in campus environments. As librarians ponder the implementation of technology loan programs and integration of the iPad with their instructional efforts, curricular uses of a device like the iPad are in need of sustained study.

The user needs and use cases for tablet computers are a new area for librarians. As we seek to understand this area, user feedback based on actual use in educational environments can guide funding choices. We seek to understand the curricular tie-in of the iPad among the undergraduate first-year cohort. Using focus group and survey data, this study details these use models and advances areas of mobile application development for new students.

Literature Review

The movement in higher education to offer sustained

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and targeted support for first-year students is manifested in many areas. One such manifestation is in the campus learning community with first-year experience programming that relies heavily on library support.[1] Technology initiatives often center on first-year groups in engineering, sciences, or mathematics. This study is unique in that the target of technology-enhanced learning focuses on the liberal arts and sciences curriculum. The reason for this choice stems from an already existing partnership with the liberal arts and sciences first-year learning community, for whom the University of Illinois Undergraduate Library has consistently provided training and tours for every fall semester.

The New Media Consortium's *NMC Horizon Report: 2012 Higher Education Edition* indicates that mobile technologies and applications will have an effect on the way students in higher education learn. On the near-term horizon, these themes have "considerable potential for our focus areas of education."[2] Specifically, "tablet computing presents new opportunities to enhance learning experiences in ways simply not possible with other devices. . . . Because tablets are able to tap into all the advantages that mobile apps bring to smaller devices, but in a larger format, higher education institutions are seeing them not just as an affordable solution for one-to-one learning, but also as a feature rich tool for field and lab work, often times replacing far more expensive and cumbersome equipment."[3]

Literature on iPad use in libraries includes studies of its application in reference services[4] and as circulating technology.[5]

These initiatives are starting points but have not detailed the new student perspective with in-depth focus groups for qualitative data analysis. With such an analysis we are better able to understand the curricular applications of mobile technology.

Methodology

Students from the LAS101 first-year undergraduate learning community at the University of Illinois were invited to check out an iPad for one week. The first-year learning community is drawn from majors in the liberal arts and sciences. A total of twenty-four students participated in the checkout of the iPad. The library used a technology loan agreement form to ensure that students would bring back the iPad. All devices were returned by the one-week deadline. The total enrollment for LAS101 is about 1,400 new undergraduate first-year students.

The iPads were loaned to students with the set of apps that come standard with the iPad. We chose to allow students to link their iTunes accounts to the iPad during checkout and load any apps that they wanted during the course of the study. We informed students that since the technology is part of a larger loan pool,

we would be wiping the contents of the iPad upon checkin. The Undergraduate Library had six iPads available for one-week checkouts. The students had to schedule a time in advance to come into the library to pick up an iPad. To bring the technology loan in line with other tech items we loan out, we did not allow renewals on the iPads, but a few students did request to keep them longer.

At the end of the semester, students were invited back to the library for three rounds of focus groups, with a total of eight students participating (see appendix 7.1 for focus group questions). After returning the iPad, all students were invited to complete an online survey. Eleven student participants completed the survey (see appendix 7.2 for survey questions). Total responses out of twenty-five students in the study were nineteen students participating in data collection.

Results

Focus Group Results

iPad-Specific Focus Group Themes

Wireless

Students liked being able to connect to wireless with the iPad 2 while in class. They found it convenient to be able to go online to check e-mail and look up Internet-based content mentioned in class. Students liked the affordance of access to lecture notes and PowerPoint slides.

Although many students have smartphones that also enable them to check their e-mail and access the Internet in class, they nevertheless listed these as specific advantages of the iPad 2. It's possible that students who would hesitate to use smartphones in class for fear of appearing to their instructors to not be paying attention would be comfortable using the iPad for the same purposes, as the latter device had been identified as appropriate for in-class use. We find that in order for the iPad 2 to be useful to students for in-class use, Wi-Fi needs to be available in all classrooms on campus. Students may not be willing to make use of their own data plan since this may incur additional cost.

Convenience

Students had many positive things to say about the convenience of the iPad 2. Students liked its portability and found it easier to bring to class than a laptop. They liked the fact that it enabled them to take notes in class as well as bring their study notes to class without having to print them out, and they found the auto-correct feature easier to use on the iPad 2 than a laptop. Students found it convenient to be able to quickly

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pull up a video that a professor mentioned and liked that it allowed them to collaborate easily with friends by showing their work. The iPad 2's translation app made it convenient for students to quickly translate specific words in class without the help of a dictionary.

Course Uses

Students found a number of course-specific uses for the iPad 2. One student downloaded a free chemistry app that allowed her to view and rotate 3D molecules. A student in art said she found the iPad 2 a useful way to showcase her digital portfolio. A number of students found it useful to be able to record lectures in larger classes with the Voice Memo app and to perform quick calculations in math classes with the Calculator app.

Libraries could provide lists of suggested apps that are particularly useful for different courses or fields of study, such as the 3D molecule app. Alternately, when students check out the iPad 2, they could be given the option of having the library preload the device with apps focused on their major specific courses.

Productivity

There were certain apps that students found increased their productivity in class, such as Voice Memo, Calculator, and note-taking apps. Overall, however, students commented that they didn't think the iPad 2 is a productivity tool yet. Some found using the iPad 2 actually decreased their productivity because they had to redo their work in the desktop environment.

To ensure that the iPad 2 is a productivity tool for students, apps that support productivity should come preloaded on the device. Apps that allow students to easily transfer their work from mobile to desktop environments without having to duplicate the work are particularly important. Students expressed reluctance to buy apps on their own, so preloading would be the best option. Since students at the University of Illinois have access to Google Apps, bookmarking these on the device could help remind students that they can store documents in the cloud and access them from a desktop after the loan period ends.

Drawbacks

Although students found it convenient to take notes in class with the iPad 2, the device did not work well for more intensive research and writing due to its lack of a keyboard. Further, students ran into compatibility issues that prevented them from accessing course content. Course management software and online quizzes did not always load, and the iPad2 was not able to play all videos. Supplemental apps like the Photon Flash Player Browser for iPad by Appsverse could help alleviate Flash issues.

More and more, in-person courses are incorporating online elements in the delivery of course content (PowerPoint slides, video tutorials), collaboration between students and faculty (wikis, message boards), and learning assessment (online quizzes). As this hybrid model becomes the norm, it is important for these compatibility issues to be resolved for iPad 2 to be a useful tool for supporting student learning. Additionally, libraries that loan out the iPad 2 should consider offering a keyboard and stylus in order to make the device more useful for research and writing.

Mobile Application Development Focus Group Themes

The focus group also collected data on specific mobile applications for development. We asked students to consider campus apps that should be developed for first-year students and asked them to consider what library apps could be developed to support first-year students.

Campus Apps for First-Year Students

Among ideas generated for first-year campus apps, students suggested a campus map app, tools that could help them choose courses, and a tool to track their grades. Students suggested the campus mapping resource could act as a tour guide and also show them around the physical layout of buildings. Although the campus bus company does provide mobile-accessible route information for Champaign-Urbana, the specific need students articulated was for apps that are modifiable to their immediate campus route— not a general map of all routes. This is significant to note in that first-year students have unique needs that are not directly served by general campus or citywide resources. A need for configurability to the individual is a desired feature set for campus mobile applications.

We learned about a desire for mobile applications that feature course integration. Specifically, students wanted an app containing the professor's contact information and office hours. It should be noted that the desired functionality for this resource is for students to be able to customize this app with their currently enrolled information so they have only the data relevant to their current enrollment and not access to information outside of their immediate course-related needs.

First-year students requested apps that suggest courses as well. Students in their first year face the prospect of choosing next semester's and yearly courses. Since they have not yet had much experience doing this, they want to be able to make use of a suggestion app that recommends courses to them. These apps should be configurable to the immediate major-specific requirements of individuals.

A final suggestion for a campus-specific app that surfaced during the focus group was a grade monitor for tracking grade progress through the semester. Students said they were not accustomed to not knowing where they stood with specific course rankings and so wanted to be able to know where they stood at any given time in the course. This is indicative especially of a need that first-year students have when making the transition to university study.

Library-Specific Apps

One of the more compelling library support tools that students suggested the library develop was a technology availability resource tool that could give a quick mobile view of circulating technology items available in the Undergraduate Library and allow them to reserve items. A prototype implementation of this technology availability app was completed after the study.

Students also asked for the development of a mobile app to make students aware of all the resources available, since they indicated that the way they had learned about the library was word of mouth. The broader implication for orientation services in library settings could be to catalog available services and package these into future first-year student apps that could supplement or replace the word-of-mouth knowledge of the library.

Students suggested the library develop an app of library locations, as well as a tool that could bring the user to the location of an item in a building, akin to library GPS technologies, commenting:

> Type in the book you want and it shows you exactly where to get it, which library and where inside that library.

Students asked that this app also lead to leisure reading and suggest books suited to user interests. In addition to locating books, the focus group participants said that they would benefit from a mobile application from the library that helped them make citations. Students also thought the library could be involved in making a translation tool, either developing or providing access to quick translation apps or language dictionaries. Part of the impetus for this stems from many of the first-year student participants being enrolled in courses that satisfy language requirements for their major.

Survey Results

Of the eleven students who responded to the survey, five had previously used an iPad before this study. All eleven students who completed an Internet-based survey reported that they had previously downloaded apps from the iTunes App Store.

Survey Result 1: Apps Previously Used for Educational Purposes

Of those students who reported previously using apps for education, the most frequently occurring use was the dictionary (four of the eleven students). The second highest was a periodic table app (two of the eleven students). Other previously reported uses of educational apps included:

- University of Illinois app
- Kindle
- Air Todo
- Wolfram Calculus
- Weather Channel
- Stocks
- Discovery Channel
- 9/11 memorial app
- language translation apps
- flash card apps
- iRead
- 3D brain and molecules

Overall, there were a number of apps from the sciences as well as a majority of uses for access to reference sources.

Survey Result 2: iPad Course Use

Four of the eleven students responding to the survey reported that they did not use the iPad for course (in class) use. Of those who did use the iPad for course use, some reported using the iPad to take notes (three of the eleven students), access online notes in class (three of the eleven students), and look up subject and course terminology in class (two of the eleven students). Other reported use themes included:

- recording homework
- making to-do lists
- e-mail
- checking updates on course websites

Survey Result 3: If iPad Was Not Used for Course Activities

The most highly reported nonclass use of the iPad was to check e-mail (four of the eleven students) and social networking (three of the eleven). Other frequently occurring noncourse uses of the iPad included listening to music, watching movies or video, playing games, using FaceTime, and quickly accessing the Internet. Other reported uses by students taking the survey included:

- Web browsing
- Skype

- talking to friends
- note taking
- bus schedule
- online shopping
- StumbleUpon
- news
- weather

Survey Result 4: Type of Class Work Most Applicable to Using an iPad

The most highly reported (four of eleven) type of class work most applicable to the iPad was note taking. Students also agreed (three of the eleven) the iPad could support class work through Internet searching. Two of the eleven responded that the iPad was useful for providing access to Internet-based course work. Other reported uses included:

- writing
- reading
- science classes
- watching videos
- French course
- vocabulary

Discussion

Investigating parallel trends among the results from both our focus groups and our surveys, we found that students view the iPad as useful for in-class Internet-based functionalities. These include accessing facts related to courses and accessing online notes. This in-class functionality can also extend into making use of the instructor's outline for the day and taking notes in class.

The main use cases of the iPad heavily feature the use of wireless access to data; in-class and out-of-class top uses included Web features (accessing online notes and looking up course terminology). We find that among this cohort the iPad is an Internet device. Without data connectivity, the iPad would lose much of its feature set for first-year student use preferences.

Configurability to individual needs was another key trend from results surrounding mobile apps. Students wanted the library to have apps relating to major fields of study that directly meet their assignment-level needs and that can connect them with specific, useful, current course information (such as professor office hours and contact information).

The use of the iPad specifically for science classes was an unexpected finding; we did not expect that students would mention in both the surveys and the focus groups that the iPad could be useful for chemistry classes and for using a 3D molecule app. As we found in our surveys, there are a number of science apps and a majority of uses for access to reference sources.

Surprisingly, there were many uses of the iPad that moved the device beyond a simple tool for accessing Google—students accessed course content by way of their online course management pages and sought out online course notes in class with the iPad.

We previously thought that one week would be sufficient time with an iPad, but as we talked with the students we recognized that they might need longer checkout times to truly experiment with the iPad and take advantage of all its features. Students may be less likely to make full use of applications if they don't have an iPad for longer than one week. Some students suggested semester checkouts, while others thought two to four weeks could be sufficient time.

What This Means for Other Academic Libraries

We advise libraries to allow their iPads to circulate from the library with a borrower agreement form, since a library that restricts the iPad to in-library use is actually restricting students from making use of the quick Internet-based uses in class, as well as the note-taking affordances of the iPad.

Libraries will want to consider researching what course packages should be delivered to the iPad. As a start, consider a general major-specific (e.g., a chemistry major) course package, where students have the option of a particular iPad image loaded onto the iPad at the time of checkout. This added value will make the student's time with the iPad more valuable and worthwhile in meeting curricular needs.

Various language-learning apps should be loaded onto the iPad at the time of checkout. If a student is taking a language course, we find that it makes sense that the library would develop a collection of apps that could support the language-learning needs of the curriculum. We find that for first-year students, reference sources and access to tools that support rote learning (flash cards or dictionaries) are preferred. This may change and evolve as the first-year cohort moves into major-specific courses.

By students' reported use, the iPad does not comprehensively replace desktop functionalities: no student reported writing in-depth research papers on the iPad, and no student reported lengthy research time on the iPad. To design mobile services for the iPad is to design quick and efficient access to Internet-based information.

Conclusion

There is a novelty value to using new tablet computing. But this same novelty has real application to how new undergraduate students learn. It can address connectivity in the classroom and better connect students

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to course-related material in these environments. The iPad is well suited to meet the curricular needs and preferences of students both in and out of classes. If future tablet computers can offer fully featured productivity apps and functionalities, they will become truly valuable for curriculum-based uses.

Notes

1. M. Lee Upcraft, John N. Gardner, and Betsy O. Barefoot, *Challenging and Supporting the First-Year Student: A Handbook for Improving the First Year of College* (San Francisco: Jossey-Bass, 2005).
2. Larry Johnson, Samantha Adams, and M. Cummins, *NMC Horizon Report: 2012 Higher Education Edition* (Austin, TX: New Media Consortium, 2012), 6, http://www.nmc.org/pdf/2012-horizon -report-HE.pdf.
3. Ibid., 7.
4. Megan Lotts and Stephanie Graves, "Using the iPad for Reference Services: Librarians Go Mobile," *College & Research Libraries News* 72, no. 4 (April 2011): 217–220.
5. Sara Q. Thompson, "Setting Up a Library iPad Program: Guidelines for Success," *College & Research Libraries News*, no. 4 (April 2011): 212–236.

Acknowledgment

Appendix 7.1: Focus Group Discussion Questions

1. Beginning focus group questions
   - How would you describe first-year course work?
   - What do you like about your courses?
   - What is difficult about first-year course work?
   - How would you rate the campus wireless network?
   - How would you rate computer availability?
   - Are there additional computing resources you want in the Undergraduate Library?

2. iPad questions
   - What did you like about using the iPad for course work?
   - Was it useful for course work?
   - What additional ways might you use the iPad to assist in your academic work?
   - What would make the iPad more useful?
   - What didn't work well with the iPad course work?
   - What would you like to be able to do with the iPad that you were not able to do?
   - Did you use any of the provided apps for course work?
   - What additional software should be loaded on the iPad?
   - Would you recommend the iPad for course work to a friend?
   - If you were recommending the iPad for course work, how would you describe it to friends?
   - How did the one week loan period affect your use of the iPad?
   - If you could change the amount of time you kept the iPad—what would be an alternative amount of time for check out?

3. Library/campus apps
   - If you could design an app for first-year students, what would it include?
   - If you could design an app for the library, what should a library app have?

Appendix 7.2: Internet-Based Survey Questions

All questions were open response.

1. Have you used an iPad before?
2. Have you downloaded apps from iTunes App Store before?
3. If you have used apps from iTunes before, what apps have you used for educational purposes?
4. If you used the iPad for any course activities, please describe your activities with the iPad?
5. If you did not use the iPad for any course activities, please describe how you used the iPad?
6. What type of classwork seems to be most applicable to using an iPad?
7. What is your major?
8. Please list all courses you are enrolled in for this semester?

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