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Targeted Evolution of Embedded Librarian Services: Providing Mobile Reference and Instruction Services Using iPads

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Abstract

The University at Buffalo Health Sciences Library provides reference and instructional services to support research, curricular, and clinical programs of the University at Buffalo. With funding from an NN/LM MAR Technology Improvement Award, the University at Buffalo Health Sciences Library (UBHSL) purchased iPads to develop embedded reference and educational services.

Usage statistics were collected over a ten-month period to measure the frequency of iPad use for mobile services. While this experiment demonstrates that the iPad can be used to meet the library user's needs outside of the physical library space, this paper will also offer advice for others who are considering implementing their own program.

Keywords

Education; embedded librarians; iPads; library services; mobile technology

Introduction

As reference librarians, it has become necessary to provide point-of-need, mobile reference services to meet user's information needs. For over a decade librarians have been experimenting with roving reference models as a way to seem more approachable and to connect with students.¹⁻⁴ An increasing number of scholarly resources can now be found in the virtual environment, making it unnecessary for patrons to be physically present in the library to access information. Since research and information seeking is occurring more frequently outside of the physical library, it has become increasingly important to have the ability to provide mobile instruction sessions and reference services in other locations to continuously meet the information needs of library users.⁵

The University at Buffalo (UB) is located in Buffalo, NY with three distinct campuses serving over 30,000 students annually. The Reference and Education Services librarians at the University at Buffalo, Health Sciences Library (UBHSL) serve five distinct user groups on UB's south campus. Each of these user groups have very unique needs. These groups include the School of Dental Medicine (SDM), School of Medicine and Biomedical Sciences (SBMS), School of Nursing (SON), School of Public Health and Health Professions (PHHP), and School of Pharmacy and Pharmaceutical Sciences (SoPPS). Additionally, the UBHSL provides support to the New York State Center for Excellence in Bioinformatics and Life Sciences at the downtown Buffalo Medical Campus.

Reference desk statistics at UBHSL have been collected over multiple years. Information gained from reference sampling demonstrated that once the simple way-finding transactions, such as directional inquiries, were removed, results showed a decline in meaningful reference patron interactions at the reference desk. This decline is not unique to UBHSL. At the University of Northern British Columbia, face-to-face reference transactions have been declining at an average rate of 9.8% per year, while virtual reference transactions have increased at an average of 500% per year.⁶ The idea of mobile reference has been discussed for many years, with articles even as far back as 1972 arguing that a stationary librarian may be missing out on as many as two-thirds of patrons who hesitate to approach the reference desk.⁷ Roaming has potential to increase the effectiveness of reference services and increase patron-librarian interactions.^{2,3,5} The investigators hoped that this experimentation with mobile and embedded librarianship would aid in reaching more students and faculty and break down barriers with the reluctant reference patron.

In addressing the broad mandate to support the educational research, outreach, and clinical programs of the health sciences schools, UBHSL is committed to supporting scholarly research needs by developing innovative services to increase information literacy skills in biomedical databases. The goals for this project were multifold: to provide mobile and embedded reference and education services to UB's south campus population; to provide students and faculty with quality information sources "where they live" in order to make informed choices in both research and clinical endeavors; and to measure the impact of mobile librarianship on UBHSL's constituents.

Liaisons are often called upon to provide reference services in the virtual environment through chat services and e-mail, as well as in locations outside of the library. Some library liaisons are frequently recognized and stopped in cafes, hallways, and clinics around campus to provide answers to on-the-go reference queries. For many of the liaisons, regular office hours are scheduled and held outside of UBHSL in the health sciences schools. The dental school liaison regularly spends a portion of the week embedded in the UB dental clinics providing reference and information services to clinical faculty, residents, and students working on the dental clinic floor. The ability to provide information to students and faculty in non-library locations was the impetus for experimentation with embedded librarian services using mobile technology. The attempt to encourage spontaneous instruction sessions and consultations, thereby constantly improving reference and education services for the UBHSL community, is an ongoing mission of the UBHSL. It was the investigators' belief that by bringing instruction to the user at the point-of-need, librarians could provide

better service to a population with extremely rigorous schedules, effectively market a new type of mobile library services, and increase the visibility of librarians and library services. In order to accomplish these goals, the project would require technological mobility outside the library.

Methods

In a time of declining library budgets, funds to purchase mobile equipment were unavailable, creating the need to seek out external funding sources. Receipt of a Technology Improvement Award from the National Institutes of Health/National Library of Medicine, Mid Atlantic Region (NN/LM MAR) allowed the purchase of equipment that was both cost effective and portable. This equipment could be used by UBHSL liaisons to provide mobile reference and education services. After investigation into a variety of tablets that would allow for maximum mobility, variety and availability of apps, cost effectiveness, and longevity, it was decided that the iPad was the best choice in order to meet the goals of the project. Lotts and Graves in 2011 reported that the iPad was best due to its multi-functionality as well as mobility, and was ideal for this type of use.⁴ A 2011 study also found the iPad superior for answering complex reference questions with an added bonus of improving the librarian image with patrons due to the iPad's modern design.⁸ One major issue that prevented purchase of Android tablets at the time of this project was the limited availability and development of apps in the Android market. This has since changed. Development of apps in the Android market has become more robust, making Android devices more competitive with Apple products.

Equipment purchased included the following: iPads and protective keyboard/case combinations for each liaison; two lightweight, portable projectors; two Apple TVs, which would allow for wireless connection to the projectors through the use of Apple AirPlay; and a lightweight screen. Additionally, an Apple Dock Connector-to-VGA Adapter was purchased for each liaison to connect her iPad to existing instruction stations throughout the campus. This combination of equipment would effectively allow UBHSL liaisons to create an impromptu instruction classroom in almost any location or give them the option to use their iPad with existing classroom technology. Due to the nature of funding, app purchases had to be tracked and accounted for to ensure that they remained within the parameters of the grant funding. In order to address this issue, iTunes gift cards were purchased so that each liaison could customize her iPad through selection of medical and productivity apps that would be unique and useful in meeting the needs of each liaison's constituents. Liaisons were required to submit all app purchases to the investigators for tracking.

Once equipment was purchased, training was provided for the liaisons in order to address the disparities in experience levels with the devices. The majority of training sessions were presented as part of departmental meetings for the UBHSL Reference and Education Services Team (RES). Prior to equipment distribution, each liaison participant was required to sign a memorandum of understanding stating acknowledgement of NN/LM funding rules with regard to the NIH access policy regarding any subsequent publications that may result from the project, and outlining acceptable app purchases and use of the equipment. In

addition, each liaison agreed to statistical tracking of any and all reference and education transactions where the iPad was used.

Data collection for this project occurred over a ten-month period, beginning in July 1, 2013 and concluding on April 30, 2014. Google Forms was used to create a short, simple survey for library liaisons to fill out after every interaction in which the iPad was utilized. Data collection focused on the following six main topics: type of activity, resources used during the transaction, patron type, location of interaction, liaison's name, and liaison's opinion of how well the iPad functioned for the activity. The primary objective of the survey was to measure the frequency and location of iPad use, and to assess the number of patrons reached outside of the library. A secondary objective of the survey was to determine whether the iPad was a powerful enough tool to use in reference and education transactions to meet the information needs of both UBHSL liaisons and patrons. The survey responses were downloaded to Excel for descriptive statistical analysis.

Results

Over the ten-month period, a total of 49 interactions were recorded ($n=49$). Of activities measured, the iPad was most frequently used for reference transactions, with 43% of interactions taking place within this category. Instruction activities followed at 21%, with the remaining interactions closely distributed across the remaining categories as seen in Table 1.

A wide variety of apps and web resources were utilized during interactions with the iPad, with more than half of the interactions (57%) utilizing more than one resource at a time. The EndNote app was the highest employed app, as it was used during 24% of the interactions with UBHSL constituents. PubMed was the most frequent database consulted, and its use comprised 18% of the total transactions. Table 2 illustrates the complete list of apps and web resources consulted during the duration of the project.

Teaching and research faculty were the most frequently encountered patron type, with nearly half of recorded interactions (41%) occurring with this constituent group. Graduate and professional students followed, occupying 33% of the population sample. The remaining categories of constituents reached included undergraduate students (5%), research staff (9%), and colleagues both inside and outside of UBHSL (12%). While there was variation among patron or user type, there was a near even distribution of recorded responses among the location category. The fewest amount of transactions occurred in faculty members' offices (6%). An equal amount of interactions occurred within UB Dental clinics, classrooms, and UBHSL offices (16.3% per location). Hallway/Lounge/Café accounted for the highest frequency location (23%) with conference rooms following closely (21%).

Of the five liaisons participating in the project, the Pharmacy liaison and Dental Medicine liaison utilized the iPad for embedded services most frequently at 39% and 33% respectively. The Nursing, Medicine, and Public Health liaisons were less frequent users, each accounting for between 6% and 12% of all transactions. As liaisons used the iPad, they were asked to rate the ability of the iPad to fulfill user needs for each transaction. The

success of the iPad for each interaction was ranked on a one-to-five scale. A score of one indicated that the iPad was unable to meet the needs of the liaison and constituent, with a score of five indicating that the iPad met and/or exceeded expectations. Nearly three quarters of recorded transactions received a score of five (69%). While the iPad on occasion received a score of two (4%) or three (8%), no recorded transactions received the lowest score of one.

Discussion

The primary goal of this project was to experiment with mobile technology to provide embedded librarian services. This project was designed with the desire to provide point-of-need reference and instruction by meeting UBHSL's constituents in their respective locations, bringing library services directly to the user. Due to the expectations of the project, it was anticipated that the most frequent use of the iPads would be for reference services. Despite the fact that instruction was the second highest recorded use of the iPad, it was thought at the beginning of this project that the iPad in conjunction with the portable projector, screen, and Apple TV would result in a higher proportion of the recorded statistics. While there were instances of iPad use for group instruction purposes, the iPad was used only when existing in-classroom technology failed and the iPad could then be connected to the classroom instruction equipment via the purchased adaptors. Most often, liaisons would bring the iPad to teaching sessions as a fail-safe, and use the technology already present within the classrooms.

A total of 26 different apps and web resources were utilized during this project. Many of the apps and resources were consulted only once for the duration of the project, accounting for the ratio of resources consulted to total amount of recorded statistics. EndNote, a citation management program, is very popular with UBHSL constituents, which is why the EndNote app was the most frequently used tool. The app can be synced with a user's desktop library, and will allow the user to perform the same reference gathering and annotating as the desktop version. The liaisons made it a priority to utilize PubMed when answering reference questions with the iPad as PubMed is a resource that many current UBHSL students will continue to have access to after graduation. Promoting the usage of PubMed was a primary goal of this project with the intention of influencing the literature searching habits of future medical professionals by demonstrating the ease of accessing evidence-based information via freely accessible resources.

While only a small amount of undergraduate students benefitted from the outreach efforts of this project (5% of transactions), this was expected due to the location of liaison services. Most of the liaison outreach took place on the UB South Campus or Downtown Medical Campus as these campuses house the library liaisons' corresponding departments. These campuses have a student population that is heavily comprised of graduate and professional students, which accounts for the much higher amount of graduate/professional students reached (33% of transactions).

It was surprising to discover an almost even distribution of recorded transactions across the location category. It was initially thought that a larger amount of transactions would take

place within the clinical setting. During this project, the clinical dental librarian had just launched librarian services within the dental clinics, which may account for why more interactions did not occur in this setting. Having a librarian available within pre-doctoral dental clinics to provide clinical librarian services is a relatively new concept, and dental school faculty, staff, and students are still adjusting to the librarian's presence in this location. It was a pleasant surprise to see the number of transactions that occurred in a hallway/lounge/café, as it was hoped that more reference interactions would take place serendipitously if a librarian happened to be in the right place at the right time, equipped with mobile technology.

It was not surprising that the pharmacy and dental medicine liaisons were the most frequent users of the iPad for embedded services, as these liaisons currently have embedded office hours within their school. As for the other liaisons, the public health and medicine liaisons did not have embedded hours during the time of this project, which would account for their relative low usage. Both liaisons have very large schools that include multiple departments, and neither individual had a central location where they could set up on-site services. While the nursing liaison currently does have embedded office hours, she has her own private office and computer within the school. She only had need of the mobile technology when her office computer failed. In addition to these limitations, when liaisons would meet with faculty members in their own setting, they would often utilize the office technology rather than using the iPads.

Overall, the iPad was considered to be a successful tool for completing mobile liaison services, as almost 70% of recorded transactions received the highest score of 5. When the iPad received a score of less than 5, it was generally due to the loss of some functionality of a database or limitations of an app versus traditional desktop capability. Such recorded instances showed that Ovid MEDLINE did not display properly on the iPad. While the EndNote App was the most frequently used tool on the iPad, this app often received lesser scores of 4 and 3 as there is no Cite-While-You-Write function or ability to find full text, which are very popular tools of the desktop version. Because these elements could not be demonstrated by the app, liaisons could not fully answer questions that stemmed from these functions. Besides these few instances, the iPad was able to fulfill most information needs of library liaisons and library constituents successfully.

While the main objectives of this project were to create and support embedded librarian services, the project investigators discovered that liaisons used the iPad for many secondary uses as well. When surveyed informally, it was revealed that most liaisons used productivity apps to record notes during meetings, annotate PDFs for their own reading and research, and manage their day-to-day workflow. The iPad was also frequently used to photograph library events and exhibits for posting to UBHSL's social media accounts. Even though secondary usage statistics were not recorded, it is apparent that the iPad can be utilized in a variety of ways within the academic library setting.

Limitations

While this project is considered to be an overall success as library liaisons were able to reach more constituents outside of the physical library by using mobile technology, there are some limitations to be addressed. One such limitation would be the sample size of the data, as only 49 instances of mobile reference and instruction services were recorded. More statistics could have been gathered had liaisons been required to create and maintain office hours within their school departments using the iPad in order to participate in the project. It is also possible that more mobile reference and instruction interactions would have occurred had the investigators required liaisons to more frequently promote the project as well as utilize the mobile technology. In retrospect, data collection of the previously mentioned secondary uses should have been collected in addition to the mobile reference and instruction statistics to reflect how often the iPad was truly used by library liaisons.

Further investigation of group purchasing under a corporate account to avoid set-up issues and complications should have occurred, as a sixth liaison encountered a blending of her personal and professional Apple IDs. This instance took a considerable amount of time to rectify, and resulted in the liaison withdrawing from the project to prevent her information from once again merging. Corporate purchasing is only available when purchasing iPads in units of 10. Had this information been known during the planning stages of the project, the investigators would have considered applying for enough funding to purchase additional iPads to meet the minimum required amount to qualify for corporate purchasing.

Conclusion

When considering implementing embedded librarianship as well as mobile reference and instruction, the iPad is a tool that can be successfully utilized for these services. The portability and capability of the iPad allows for reference and instruction to occur outside of the library walls, letting library liaisons meet their users in their own setting. Because of this, UBHSL's liaisons plan to continue to use the iPads for mobile and embedded librarian services. The implementation of this project has lead to other University at Buffalo Libraries' departments purchasing iPads and mobile instruction equipment to support library outreach. When considering implementing a similar program, it is important that librarians consider the following: investigate the corporate purchasing model to avoid set-up complications, create clear wording within liaison contracts to clarify what is expected of each individual to create a successful program, and promote the program widely and frequently. It is also recommend to consistently meet with the project team to discuss possible new ways to use the iPad in order to facilitate creative and innovative uses of the device.

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Table 1**Type of Activity**

Type of Activity	Recorded Instances	Relative Frequency
Reference	21	43%
Instruction	10	21%
Teaching Consultation	2	4%
Research Consultation	6	12%
Presentation	3	6%
Other	7	14%

Table 2
Frequency of App/Resource Utilized

Resource Used	Recorded Instances	Relative Frequency
EndNote App	21	24%
PubMed	16	18%
MEDLINE	4	5%
Web of Science	3	3%
Other UB Libraries website resource	7	8%
Email App	2	2%
Calendar App	1	1%
Google	4	5%
Prezi App	2	2%
HUBNET	4	5%
Embase	2	2%
Facebook App	1	1%
UB EBM Resources	1	1%
Blog	1	1%
iPad Notes Feature	1	1%
CINAHL	1	1%
Goodreads	1	1%
Read by QXMD	1	1%
ADA.org	1	1%
Pages	3	3%
GoodReader	3	3%
Keynote	2	2%
Numbers	2	2%
UBIT website	1	1%
Medscape App	1	1%
Trello	1	1%
Google Drive	1	1%