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Library self-disruption: The key to surviving and thriving

» A library dean and professor dialogue on learning technologies and mutual dependence

BY SUSAN M. RYAN AND W. TANDY GRUBBS

Disruption and change, especially in the area of technology, continue to have a major impact on society. The higher education community is certainly not immune to these trends. In this article, the authors, the library dean and a professor of chemistry at Stetson University, engage in a dialogue on learning technologies and mutual dependence.

Susan Ryan, library dean: *Fortune* magazine regularly asks CEOs to identify their biggest challenge. For the past two years, one of the top answers has been

the “rapid pace of technological change.”¹ The media discusses innovation/technological disruption and its effect on businesses on a daily basis. The impact of rapid technological change would also surely make it into most library administrator’s top five challenges. Libraries, like corporations, have experienced the effects of disruptive technologies for years and have responded with varying degrees of success. Gutenberg’s printing press is one of the first disruptive technologies, but others have followed—the Internet, e-books, open access, and self-publishing have all wreaked havoc on commercial

INTERACTIVE WHITEBOARDS IN LIBRARY INSTRUCTION

*Facilitating Student Engagement
and Active Learning*

THE PROVISION OF MOBILE SERVICES IN US URBAN LIBRARIES

CHANGING THE CLIMATE
*Staff Development Activities that Address
the Real Issue, Communication in the
Workplace*

publishers and the way libraries acquire and distribute information.²

At Stetson University, a primarily undergraduate institution with 3,000 students, our library has grappled with the fast-paced changes in higher education that affect how students learn, most driven in some way by technology.

What is the solution to navigating the barrage of technological disruption? Perhaps libraries should practice self-disruption to stay ahead of the curve.

Many libraries tend to ignore disruption until they feel forced into change. Inadequate budgets, administrative priorities, and lack of staff expertise may all contribute to our reluctance to embrace technological innovations. A dramatic change in Stetson University's overall administration a number of years ago, however, offered our library a window to become bolder. We used our window of opportunity to make *disruption* a strategic priority. We chose three broad areas for our strategic direction: teaching and learning, collaboration, and innovation.³

Our first major technology-related disruption, however, involved a tough mental transition for some of our librarians. In 2013, the library received a large "innovation" endowment for innovative services of the library's choosing. We decided to offer subsidized 3-D printing, although 3-D printers were far from ubiquitous in libraries at that time. Some of our librarians failed to see the relevance in offering such nontraditional library services. Others, however, believed that 3-D printing would be a healthy direction for our library, if we could align the service with our mission and goals. We also knew that successfully implementing 3-D printing in a way that aligned with our goal to promote teaching and learning required classroom collaborators as well as innovation.

W. Tandy Grubbs, chemistry professor: For most of the modern era, chemical educators have practiced as solo artists, relying upon a chalkboard, a well-equipped stockroom, and the occasional classroom demonstration to teach effectively. In the lab, students hand-recorded empirical data on paper. Advances in technology over the last three decades ensure that students now have a variety of software/web-based tools and mobile apps that can be used to analyze data, mathematically model complex physical systems, and visualize the molecular world. To keep pace with modern, high-impact practices, educators

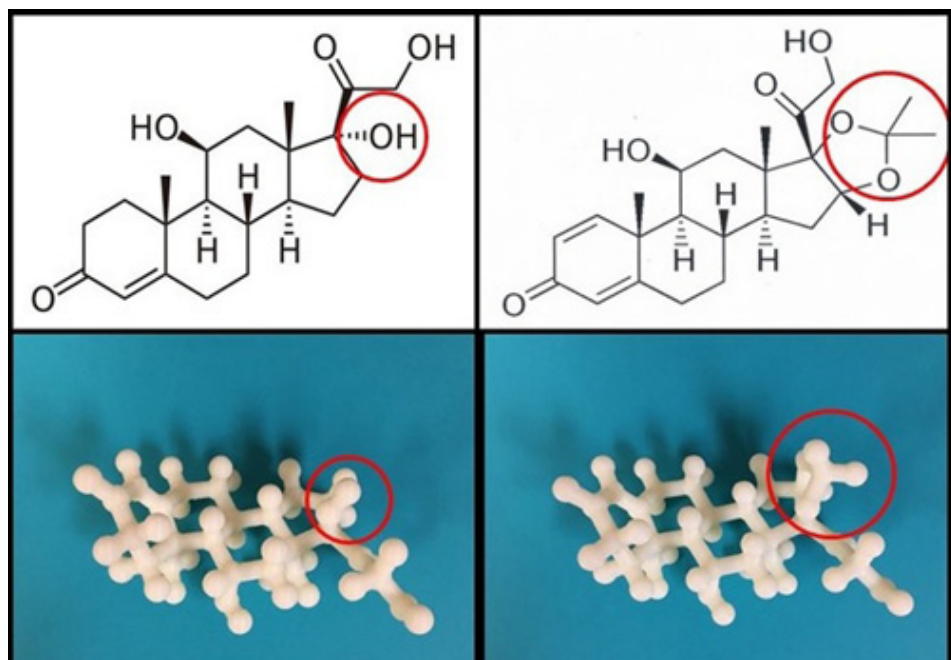


Figure 1. Two common topical pharmacological agents (Hydrocortisone, left; Desonide, right) that possess similar molecular structures. 3-D printed models of each drug allow students to better grasp the similarities and differences (circled in red) in these structures.

must be willing to self-disrupt traditional instructional approaches and embrace new learning technologies. Successful disruption requires that the educator surrender a measure of solo artist status and become dependent upon externally administered resources and expertise.

As an example, Stetson undertook an initiative that challenged chemistry students to use computational chemistry software in tandem with 3-D printing technology to create molecular models. To the chemist, 3-D printing represents a powerful tool to create more realistic tangible models of molecular structures (Figure 1).

Such an initiative would require a sizable investment in multiple printers, which would have been unaffordable at the department level.

The advantages of a library-supported 3-D printing lab include extended-hours access to printers, the availability of technical support staff, and no worries at the departmental level about 3-D printer expenses and maintenance. Thanks in large part to the availability of the library-supported 3-D printing innovation lab at Stetson, the chemistry 3-D printing initiative was a success that has led to student and faculty publications and other scholarly outcomes. 3-D printing activities have provided a means of getting students to engage further in chemistry, while at the same time practicing skills of creativity/innovation, collaboration, and technological literacy deemed important for

the 21- century workplace.

Ryan: The library's early 3-D printing partnership with the Chemistry Department provided multiple benefits. Integration of 3-D printing into chemistry lab assignments, senior research projects, and faculty research allowed us to meet our teaching and learning goals for the new technology.

Rather than just let students print out iPhone cases, we implemented the technology with academic collaborators who gave our operation instant academic legitimacy. The excitement of the chemistry faculty and students did not go unnoticed by professors and students in other disciplines. A faculty member teaching anatomy added a 3-D printing component to a project she had long-assigned, and enthusiasm for the project immediately multiplied (Figure 2). A business student created a prototype mold for a sandal strap that his family business manufactured, and an art professor discovered 3-D printing as a medium to create pieces that went into his professional shows (Figure 3).

During this initial 3-D printing spree in 2013 and 2014, the library won two competitive innovation awards—not for offering 3-D printers, but for collaborating with teaching faculty to incorporate the technology in the classroom. We had discovered a way to hit the trifecta of our strategic objectives. The 3-D printing initiative not only met our desire to have the library be a

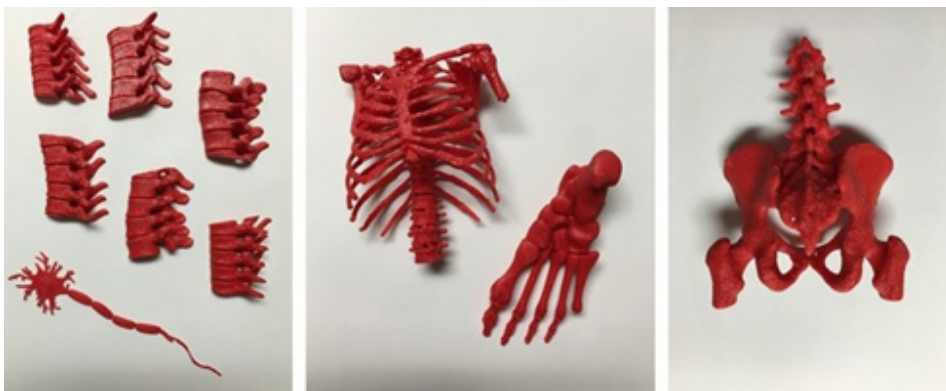


Figure 2. 3-D printed models significantly increased student interest in an Anatomy Laboratory exercise.

place of teaching and learning, but it also incorporated collaboration and innovation. Within two years of establishing our Innovation Lab, librarians, faculty, and students generated six conference presentations, four national posters, two book chapters, two journal articles, three senior research projects, and various professional workshops and webinars.

The university president, the provost, Board of Trustees members, and the university marketing staff took notice of the attention the library was receiving. Somewhat surprisingly, however, not all of the librarians embraced the library's role in hosting nontraditional learning technologies. While some did not see the relevance of providing the services, others resented the attention 3-D printing garnered. The same internal and external constituencies who praised the library's efforts to self-disrupt had largely ignored the traditional library services we provided just as well, if not better—such as research assistance, classroom instruction, and work on information literacy learning outcomes. Some librarians felt that the library's accolades

for the “new” and “innovative” marginalized other important work going on in collection development, user experience, and special collections.

It was hard to argue, however, the benefits to the library. Traffic increased in the entire building and the library—in all areas—was busier than it had been in decades. Increased attention and use meant justification for maintaining and increasing library budgets, and, in general, made fundraising easier and more effective. Despite the reservations of some librarians, the benefits of self-disruption outweighed the concerns. Thanks in part to the collaborative nature of the Innovation Lab, librarians and library staff interacted in new ways with diverse groups of students and faculty. Conversations that took place in the Lab led to our most ambitious project yet: developing a for-credit course based on the library's Innovation Lab offerings.

Grubbs: What do a political scientist, a chemist, and a librarian have in common? Ordinarily, one might answer this question “Not much.” In this particular instance,

however, this odd combination of faculty at Stetson played a pivotal role in designing a first-of-its-kind, semester-long, introductory 3-D Printing and Rapid Prototyping course. The course brought together 15 students from a variety of majors and minors, including accounting, business, computer science, digital arts, English, journalism, management, marketing, music, physics, sports business, and theater arts. Critical was the library Innovation Lab's role in both catalyzing the development of this course and, once it was launched, providing the facilities and equipment to make it successful. The initial conversation that inspired and led to the design of this course would never have taken place if the political scientist, chemist, and librarian in question had not had an opportunity to work alongside each other in the library's Innovation Lab.

Exactly how did that conversation come about? And, more importantly, how might other academic libraries play a larger role in fostering similar types of collaborative interactions on campus? By chance, the political scientist who helped create and eventually co-taught the 3-D Printing and Rapid Prototyping course was also Stetson's local DIY guru who had helped found a Makerspace for the Stetson community that eventually moved into the library's Innovation Lab. My physical chemistry students and I were also spending a lot of time in the library's Innovation Lab during the spring and fall of 2015 creating and 3-D printing molecular models. While there, we had an opportunity to rub elbows with the political scientist and library dean and have larger conversations about how to promote innovation at Stetson. Some of our students who were working in the Innovation Lab asked the question, “Why can't we take a course in that?”

We recognized that an innovation course, whatever that might be, would likely appeal to a diverse range of students, and would certainly promote technological literacy on campus. We decided that the innovation course should not be linked to any specific discipline and should not have prerequisites from any particular discipline. We looked to see how other institutions were teaching innovation and what curriculum might be involved. Surprisingly, we could not find any examples of a semester-long introductory undergraduate course focused on 3-D printing and its use as an innovation tool.

We agreed upfront that the class would be about designing prototypes and would

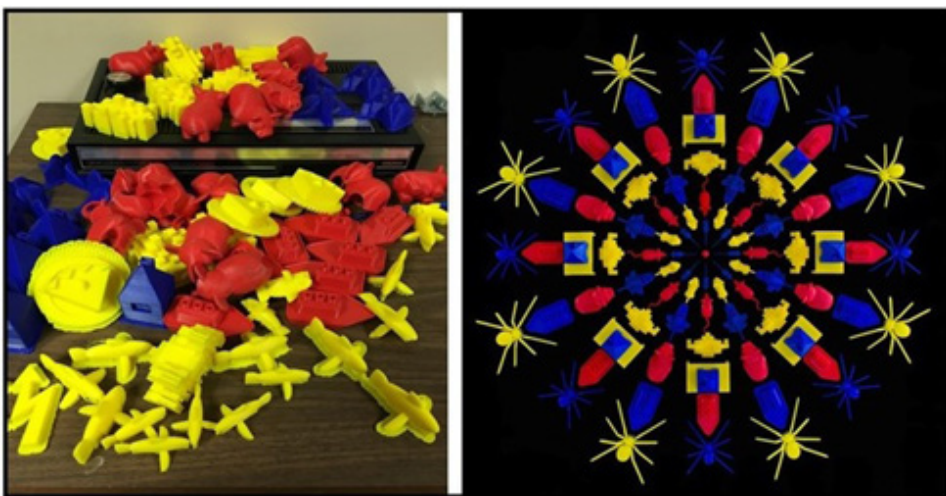


Figure 3. 3-D printed figurines used to create art pieces exhibited in professional art shows.



Figure 4. Students in the 3D Printing/Rapid Prototyping class design a prototype theatre stage set – one of 15 student prototype projects completed during the semester-long course.

be offered under the umbrella of the university's Entrepreneurship Program. The course would be project-based—each student would develop an original idea to fruition through a series of prototypes of increasing sophistication (Figure 4). The political scientist would focus on those workshop-building skills traditionally associated with the Maker movement, and would include a strong emphasis on rudimentary circuit design for electronic, robotic, and remote control.

I, the chemist, handled the primary 3-D printing portion of the curriculum, with a large part of the class time devoted to learning about 3-D graphical file formats, related computer design elements, and how to use computer-aided design software. Library staff played a key role, as well—the library dean met with the class on day one to familiarize the students with

the Innovation Lab, library hours, and the availability of library staff assistance. Much of the student work was done outside of class time, and the Innovation Lab staff assisted with 3-D printing and the use of other equipment throughout the semester. Committing to this new initiative required a sizable measure of self-disruption on the part of the two coinstructors. We both taught outside our traditional disciplines, and we both had to surrender our solo artist status on a much larger scale than we had ever done before and depend heavily upon resources and expertise outside our departments. In this case, self-disruption worked well.

Ryan: The successful 3-D Printing and Rapid Prototyping course is the most ambitious undertaking to come out of the Innovation Lab so far, but we continue to move forward. We have developed a

concept for a 24/7 Innovation Center in the library that will not only be more than three times as large in size, but will also be more ambitious in scope. Without the self-disruption, the library would have struggled to prove relevancy in today's learning environment. Stetson is certainly not alone in taking this direction. Many librarians believe that dynamic disruption positively transforms library spaces and services. One technology editor cautions, however, that the "trick [to self-disruption] is to recognize where to focus our attention to ensure a vibrant future."⁴


Despite the reservations of some, our self-disruption, with our focus on innovation and collaboration, likely secured our prominence on campus for some time to come. ■

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FOOTNOTES:

- 1 Alan Murray, "The Biggest Challenge Facing Fortune 500 Companies," *Fortune.com* (June 3, 2016), <http://fortune.com/2016/06/03/challenges-facing-fortune-500/>; "The Results of the 2015 Fortune 500 CEO Survey are In," *Fortune.com* (June 4, 2015), <http://fortune.com/2015/06/04/fortune-500-ceo-survey/>.
- 2 Marydee Ojala, "Dynamic Disruption," *Online Searcher* 39, no. 4 (2015): 4.
- 3 For the complete duPont-Ball Library Strategic Plan, see <https://www2.stetson.edu/library/green/wp-content/uploads/2016/08/Strategic-Plan-MASTER-FINAL.pdf>.
- 4 Ojala, "Dynamic Disruption," 4.



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Interactive Whiteboards in Library Instruction

» Facilitating Student Engagement and Active Learning

BY MAUREEN RICHARDS, MARTA BLADEK,
AND KAREN OKAMOTO

LEARNING AND TEACHING TECHNOLOGIES IN BIBLIOGRAPHIC INSTRUCTION

Eager to keep up with the ever-changing instructional environment, academic libraries have been quick to adopt emerging teaching and learning technologies. The literature from the last fifteen years alone documents libraries' bold initiatives to incorporate new technologies into bibliographic instruction. Learning management systems, clickers, online tutorials, reference chats, and mobile devices have all found a place in libraries' instructional programs, reshaping and improving the ways in which research skills are being taught.

At present, most colleges and universities make use of a learning management system (LMS) that supports synchronous and asynchronous teaching. As distance and online education programs proliferated, libraries promptly recognized the need to identify ways in which to make their services as well as instruction available to off-campus students through Blackboard, the best known LMS (Bell & Shank, 2004; Lawrence, 2006). The embedding of custom designed asynchronous informational literacy video tutorials into course pages (Henrich & Attebury, 2012) is just one example from the extensive literature exploring the delivery of library instruction through Blackboard. Other initiatives include incorporating research skills modules and assessing student learning through quizzes (Smale & Regalado, 2009; Stone, Bongiorno, Hinegardner, & Williams, 2004) and converting a popular on-campus workshop into an online one by using Blackboard's discussion boards and video screencasts (Rempel & McMillen, 2008).

Audience response systems, known as clickers, are another technology widely embraced by teaching librarians. Used in a classroom setting since the 1960s (Dill, 2008), clickers have not so much trans-



formed the content of instruction as they have changed the way in which librarians conduct their sessions. By encouraging student participation and allowing for instant formative feedback, clickers facilitate active learning in ways not available in more traditional settings (Collins, Tedford, & Womack, 2008). It is generally reported that clickers enhance student engagement (Dill, 2008; Deleo, Eichenholtz, & Sosin, 2009). When it comes to clickers' effect on learning, however, the research remains inconclusive. When Dill (2008) compared clicker-enhanced sessions with traditional ones, she found no difference in students' short-term recall of the covered material. Similarly, Moniz, Eshleman, Jewell, Mooney, and Tran (2010) were not able to show that

students whose instructors used clickers throughout the session learned more than students in a non-clicker library workshop. In contrast, Holderied (2011) demonstrated that the use of clickers in library workshops not only increased student engagement but also improved learning outcomes when compared with a control group.

More recently, librarians have been experimenting with mobile learning, such as tablets and iPads in particular, to enhance library instruction and facilitate student learning in general. The iPad lending program at the Art and Architecture Library at Virginia Tech was used by students in support of their coursework and related research as well as e-book reading (Tomlin, 2012). At the Preus Library of Luther College,

Sullivan (2014) redesigned her library workshops with the newly acquired library iPads in mind. At each session she distributes the 25 pre-loaded iPads among students. Under her guidance, students perform hands-on exercises rather than passively listening to a lecture. Insofar as the tablets facilitate peer-to-peer collaboration and experimentation, and increase engagement, Sullivan (2014) finds iPads ideally suited for inquiry-based library instruction. Similarly, Tran, and Meadow (2014) see tablets' "potential to enable flexible pedagogy, dynamic use of space, and increase student engagement" (p. 113).

As the above overview shows, academic librarians continually investigate the teaching effectiveness of available tools and emerging technologies. The goal of instructional technology, after all, is not only to engage students but also to enhance their learning. It is in this context that we would like to bring attention to interactive whiteboards (IWBs) whose features accommodate a variety of teaching strategies, including those appropriate for distance learners, and have the potential to enable student engagement and participation. In other words, IWBs exemplify many of the recent innovations in information and communications technologies (ICT). And yet, IWBs are rarely discussed in the context of academic libraries' efforts to embrace innovative teaching methods, even though they are widely used in business and K-12 contexts. This case study seeks to address this omission. We discuss the implementation of IWBs at the Lloyd Sealy Library, John Jay College of Criminal Justice, demonstrating how IWBs can be used effectively to meet the versatile needs of present-day library instruction. IWBs offer librarians an opportunity to reinvigorate their teaching by developing new instructional strategies that take advantage of IWBs' interactive features. To further encourage academic librarians to consider working with IWBs, we argue that incorporating IWBs, and the active learning strategies their use in the classroom fosters, has allowed our library to meet new institutional priorities that emphasize effective teaching and student engagement.

INTERACTIVE WHITEBOARDS: AN OVERVIEW

IWBs are large touch-sensitive whiteboards, typically affixed to the wall or mounted on a portable stand at the front of a room. They can be used like a traditional blackboard or, with the addition of a computer and projec-



tor, transformed into life-sized monitors. You can write on and operate IWBs with the touch of a pen, stylus, or your finger, toggling back and forth between the whiteboard and projected content. Anything you can access on a computer— documents, slides, images, web pages, applications, videos, and interactive software— can be projected on an IWB and then annotated or manipulated by touch. Depending on the model, IWBs can also be networked with other ICT equipment, such as wireless keyboards, scanners, laptops, tablets, and other mobile devices. If the introduction of traditional blackboards in the 19th century classrooms supported the shift to front of the room whole-class teaching (Greiffenhagen, 2002), IWBs are the modern day equivalent of a blackboard. They provide 21st century educators with a tool to interact with and move seamlessly between all types of content, connect to all types of devices, and create a dynamic classroom experience.

According to one report, Smart Technologies Inc. introduced the world's first IWB in 1991 and makes the world's best-selling interactive whiteboard (NEA's Member Benefits, 2016). Xerox has also sometimes been

credited with creating the first IWB, which they called the Liveboard (Brigham, 2013). However, it appears the Liveboard may have been in development (Elrod et al., 1992) and not officially introduced to the market until 1993 (Brown, 1993). Setting aside claims of who was first, today there are many suppliers of IWBs. According to a 2014 market report, at least 14 companies sell IWBs, and sales of IWBs are projected to increase at a compounded annual growth rate of 15.95% through 2018, with most of this growth occurring in educational markets (Research and Markets, 2014).

When first developed, IWBs were solutions for businesses that wanted the ability to print, save, and share information used at meetings (Greiffenhagen, 2002). Content projected on the IWBs could be seen instantly by participants in remote locations, creating a common work surface that could be collaboratively changed and saved and/or shared for future use (Brown, 1993). Evidence of early use of IWBs in education is scant, with documented use limited to STEM teaching at the university level (Greiffenhagen, 2002) and clinical training (Murphy et al., 1995; Stephens, Cook, & Mullings, 2002). A reported sale of an IWB by Smart Technologies to the University of Nevada also provides evidence of some early use of IWBs in distance education (Moss et al., 2007).

In the 2000s a shift took place. IWBs were increasingly being introduced in educational settings around the world, particularly in K-12 classrooms (Greiffenhagen, 2002). Motivated by the belief that, for nations to stay competitive, they needed to embrace technologies that developed ICT literacy skills— namely the ability to access and navigate a plethora of information and communicate using technology— governments funded large scale purchases of IWBs for use in schools (Thomas & Schmid, 2010).

IWBs IN EDUCATIONAL SETTINGS

K-12

Much has been written about the use of IWBs in K-12 settings, particularly in the UK, where the largest investments in this technology have been made. There are several literature reviews (DiGregorio & Sobel-Lojeski, 2010; Higgins, Beauchamp, & Miller, 2007; Glover, Miller, Averis, & Door, 2005; Smith, Higgins, Wall, & Miller, 2005) and an excellent comprehensive resource collecting a number of studies on the use of IWBs in K-12 settings (Thomas

& Schmid, 2010). Common themes include the effects of IWBs on student motivation, learning, achievement, pedagogy, teacher training, and resources. The research consistently reports that students and teachers—especially the early adopters of this technology—readily embrace IWBs. When IWBs are used, student motivation and engagement increase. However, few studies show a corresponding positive effect on student achievement. Studies examining teachers' use of the IWBs repeatedly stress the importance of training and professional development, both to develop the technical skills needed to use this tool effectively and to support its effective integration into sound teaching practices.

Demonstrating the principle that integrating any new ICT into an educational system is a process, Thomas and Schmid (2010) divide the research in K-12 settings into three major phases. The earliest phase was characterized by small-scale case studies—typically documenting the experience in a single classroom. This first phase was conducted by enthusiastic adopters of this new technology and focused on primary schools. As mentioned above, these studies reported that both teachers and students liked IWBs as they increased student motivation and engagement.

The second phase focused on how IWBs were actually being used in classrooms and how they supported established pedagogies. Large scale studies conducted across entire school districts or municipalities showed that IWBs were being used to engage multimodal resources that included use of the whiteboard, text, graphic, video, and audio content; improve the pace and use of classroom time; and enhance opportunities for interactions among the whole class. The study of the whiteboard expansion project in London by Moss et al. (2007) found that IWBs were being used to move between and sometimes manipulate text, images, video, and sound, either using local resources or those available through the Internet. There was also evidence that some teachers were varying the pace of delivery of content by moving quickly or slowly through various modalities and using a varied pace to create opportunities for more student interaction by employing the IWB writing and drawing tools to annotate content or create new content for the whole class. However, during this phase the differences in teacher skills and the need for readily available resources by subject became apparent. In

addition, although there are some studies showing that teaching with IWBs can lead to gains in student achievement, most studies show a modest impact (DiGregorio & Sobel-Lojeski, 2010).

The focus of the third phase of research was on developing programs and policies to optimize the integration of IWBs into the curriculum (Thomas & Schmid, 2010). The major finding was that simply providing new technology is not enough. Both technological and pedagogical professional development programs have to be established and ongoing in order to support wide-scale and effective integration of this technology into the curriculum.

Higher Education

Despite some early documented use of IWBs in the STEM fields, clinical training, and distance education, the research about the use of IWBs in higher education is not extensive. The existing literature relates to the training of future K-12 teachers (Smith, 2002; Campbell & Kent, 2010; Mott, Sumrall, Rutherford, Sumrall, & Vails, 2010); the positive perceptions of IWBs by students (Lai, 2014); the lack of success in a science lab on electricity in demonstrating significant differences in student achievement (AkbaD & PektaD, 2011); the benefits of using IWBs to teach in specific subject areas, namely, retail mathematics (Greene & Kirpalani, 2013)), as well as a proposal to use networked IWBs to improve the delivery of course content across multiple university campus sites (Dawson, 2010).

Consistent with studies in the K-12 settings, the research in higher education settings supports the positive impact IWBs have on affective learning goals by encouraging students to participate more or by creating an enthusiastic atmosphere for learning. Greene and Kirpalani (2013) found a significant improvement in students' class performance using IWBs. However, the link between use of IWBs and improvements in student achievement has yet to be widely established.

Libraries

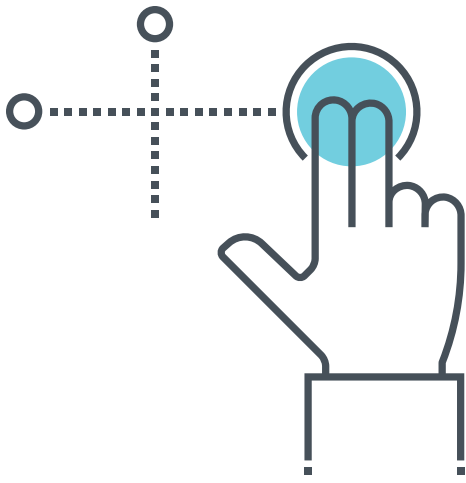
The research on the use of IWBs in libraries is similarly scant. The literature confirms that many academic libraries have installed IWBs in library classrooms (Brigham, 2014) or are installing them in collaborative library workspaces (Appleton, Stevenson, & Boden, 2011; Hussong-Christian & Stoddart, 2014; Raths, 2013; Wang, 2008; see also Ochoa,

Walker, Barrett, & Hines, 2012, who propose that librarians are best suited for teaching education students how to use this interactive technology).

Research addressing the actual use of IWBs in library instruction involves small case studies focused on teacher and student perceptions of this technology. Brigham (2013), a medical reference librarian, makes the case for the usefulness of IWBs in academic libraries. Schroeder (2007), an academic librarian, discusses how IWBs helped meet the affective learning goals in teaching freshmen by holding their attention and motivating them to learn about research. Knight (2003), another academic librarian, reports on the transformative impact of teaching research skills with an IWB that enabled her to move seamlessly through digital content, including library databases, and use the writing tools to effortlessly annotate that content while walking around and maintaining interaction with the whole class. As was the case in earlier research involving the use of IWBs in K-12 settings, these small case studies share the characteristics of the first phase of research; that is, they discussed the instructors' experience using the technology and what they heard or observed from students. The observations were idiosyncratic, not structured, and did not include efforts to measure the impact IWBs had on student learning or on how they increased student engagement.

STUDENT ENGAGEMENT AND LEARNING

Why have academic libraries been interested in learning technologies, including IWBs? And why have librarians been concerned about student engagement and learning? One explanation lies in the academic library's historic position vis-à-vis its larger institution and trends in higher education. The academic library's mission is often articulated in response to its larger institution's strategic plans and educational goals, along with prevailing trends in higher education (Appleton, Stevenson, & Boden, 2011). Over the last 30 years, institutional mandates have shifted in response to calls for reform in undergraduate education—reforms that prioritize student learning (“How are we doing,” 2003). During this time institutional and professional accreditation bodies were “shifting their attention from input measures (faculty, courses, books) to outcomes measures (what students learn)” (Smith, 2001, p.30). In other words, there was a move away from teacher-centric



models of learning to a model that focuses on student experiences and learning outcomes; this includes the knowledge and skills students acquire (Smith, 2001). This shift also changed assessment practices and concerns. Institutions were increasingly required to create and implement student outcomes assessment programs (Smith, 2001).

It was in this context that the National Survey of Student Engagement (NSSE) was introduced in 1998 to give colleges a tool to evaluate their performance and make necessary changes (Kezar, 2006). Conducted annually, NSSE targets more than 100,000 randomly selected first-year and senior students at four-year colleges (Schroeder, 2003). It assesses two components of student engagement: time and effort spent on “educationally purposeful activities” and the extent to which institutions involve students in “activities that lead to student success” (Schroeder, 2003, p. 10). Walker and Pearce (2014) explain that colleges are now focusing on student engagement because it involves institutional factors that they can directly influence, including academic support services and enrichment programs.

The literature reflects libraries’ concern about their role in this new assessment landscape—a landscape focused on student engagement, success, and learning outcomes. This emphasis on learning outcomes has led to a change in the mission of libraries from a “content view (books, subject knowledge) to a competency view (what students will be able to do),” what they have accomplished, and how the library and its resources contribute to learning (Smith, 2001, p. 32). Based on results from NSSE and the national Documenting Effective Educational Practices (DEEP) study, Kezar (2006) found that libraries make a critical contribution to student success and engagement by

- increasing academic challenge through library instruction and teaching information literacy skills;
- enhancing active and collaborative learning using current technologies and offering workshops, as one example; and
- building a supportive campus environment by providing spaces with research and technical support services.

Libraries further support engagement efforts by building faculty-librarian partnerships, promoting course redesign, and offering neutral interpretations of NSSE data—neutral in the sense that libraries are not tied to a specific discipline or to the administration (Kezar, 2006). Libraries, then, have a critical role to play in fostering student engagement.

Although academic libraries are tasked with responding to larger institutional mandates and missions, they are also driving institutional change through initiatives that introduce new learning technologies and spaces. Appleton, Stevenson, and Boden’s (2011) study of new learning spaces at four university libraries in the UK reveals how academic libraries are leading institutional change by redesigning their spaces and implementing new learning technologies. They found that these spaces are informal and encourage collaborative learning. Similarly, the University of Iowa’s Main Library led institutional efforts to improve student learning, student success, and undergraduate retention by being the first on campus to redesign their classroom into an active learning space (Soderdahl, 2011). This active learning space included mobile furniture and laptops to encourage collaboration and movement in the classroom (Soderdahl, 2011; see also Lippincott, 2006). By introducing modular furniture and learning commonstypе spaces, libraries are making spatial and technological changes in their classrooms to engage students and enhance information literacy instruction.

Over the last several years, John Jay College has situated itself and its institutional priorities within these wider trends in higher education where outcome-based assessment and student engagement are central. For example, the College established a campus-wide assessment committee in 2011 that coordinates assessment efforts for both student learning and institutional effectiveness (John Jay College of Criminal Justice. Campus-Wide Assessment Committee, n.d.). In 2013 the College

introduced a faculty-student engagement fund to support activities outside of the classroom, such as faculty and student lunches (John Jay College of Criminal Justice. Faculty-Student Engagement Program, n.d.). The fund was introduced to support student success and retention. The Lloyd Sealy Library has received these funds for lunches and new student orientation activities. Evidence of the College’s efforts to increase student engagement is also contained in the institution’s assessment reports (John Jay College of Criminal Justice. Office of Institutional Research, 2013). Aligning itself with this larger institutional focus on student engagement, the Library decided to revamp its library classroom and instruction practices by acquiring interactive whiteboards. As of today, the Library is the only space on campus with IWBs.

IWBS AT THE LLOYD SEALY LIBRARY

Institutional Context

John Jay College of Criminal Justice, a senior college in the City University of New York (CUNY) system, was established in 1964. Offering a wide range of undergraduate and graduate degrees as well as professional certifications, the college is known for its justice-oriented curriculum that combines liberal arts and sciences. In the fall of 2014, student enrollment exceeded 15,000, with 62% of undergraduate and 46% of graduate students coming from underrepresented minorities groups, mainly Hispanic and African American (John Jay College of Criminal Justice, 2014). About 42% of undergraduates are the first in their families to attend college, and about 72% of them come from families whose annual income is less than \$50,000 (John Jay College of Criminal Justice, 2013). Not surprisingly, given the college’s reputation in the field, criminal justice is the most popular undergraduate major (49%) and also the most popular master’s program (34%) (John Jay College of Criminal Justice, 2014).

The Lloyd Sealy Library Instruction Program

The unique profile of John Jay students, including their educational and socioeconomic background, frames the Lloyd Sealy Library’s efforts to promote and teach information literacy at the college. We are committed to reach as many students as possible, but, like many academic libraries, we have to work within staff and resource limits. Consequently, the Library is strategic and selective about the forms of instruction

it provides. We want to introduce students to the principles of research and the resources at their disposal at the very outset of their college careers and then expand their information literacy skills in major-specific research methods courses. Accordingly, we have been concentrating our outreach on ENG 101: Basic composition, a required freshman course that models the process of academic inquiry and introduces conventions of college-level research. We also work with 300-level courses organized around a larger project that requires students to follow discipline-specific research protocols and use specialized resources. (Besides these full-period sessions, we offer shorter workshops for other courses that include a research component.) The ENG 101 and 300-level library sessions are customized for each class as we aim for course-integrated library instruction so that students can learn the key concepts of information literacy, acquire a better understanding of the research process, and apply new skills, all in the context of their course as they work on their assignments.

IWBs training and policies

Our decision to purchase IWBs (two screens placed in the front of the room and one on each side wall) was largely influenced by the fact that using their interactivity is optional. The librarians participating in our instruction program vary in their enthusiasm about and comfort with new technologies. Moreover, the teaching load is not uniform with some librarians teaching on rare occasions only and others conducting workshops on a regular basis. The varied teaching load undoubtedly influences the comfort level with and willingness to experiment with the new teaching methods called for by IWBs. Moreover, librarians are not the only ones making use of our classroom. The room is also made available to regular faculty who choose to conduct research sessions by themselves. Without the option of not using the IWB's interactive features, we would have to train each faculty member even if they needed the classroom once, which would pose a logistical challenge. To accommodate the variety of IWB users, we developed a training program that accounts for their different needs and factors in our time constraints.

The coordinator of instruction and the systems manager were charged with exploring and mastering the IWB's setup and interactive features. Having chosen three main functions and modes that would

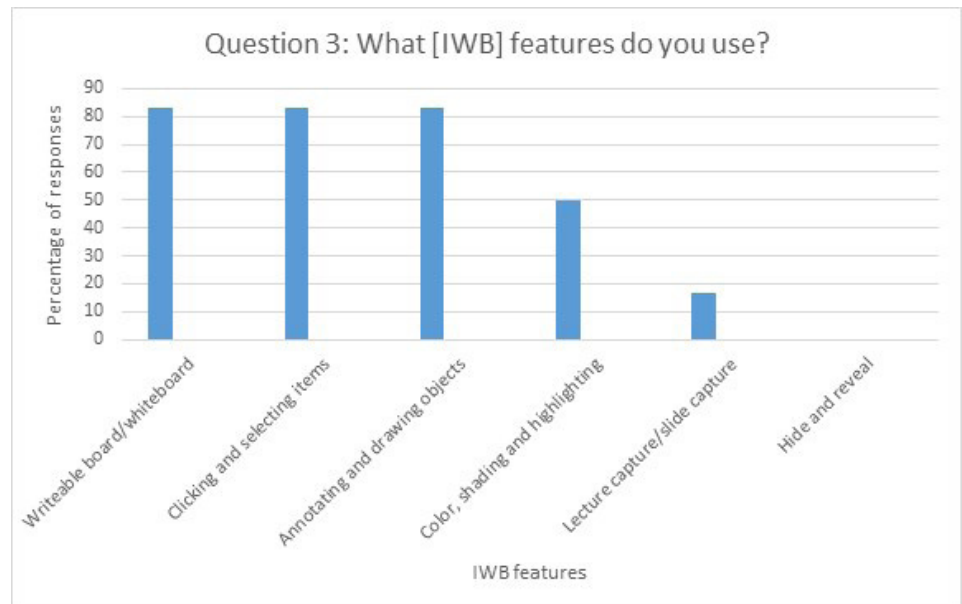


Chart 1: Interactive features used by John Jay teaching librarians.

be most useful for teaching (the mouse pointer, the highlighter, and the whiteboard modes), they invited teaching librarians for hands-on training. Training sessions were held multiple times so that everyone, including our adjunct librarians, could learn and practice working with IWBs. After the training each librarian was encouraged to get comfortable with the IWBs on their own depending on their schedule and availability. The coordinator of instruction and the systems manager were available for consultation at all times.

The training needed to be extended to librarians who do not normally teach since they set up the classroom and IWBs for regular classroom faculty who conduct sessions in the library without librarians. While this group's training emphasized turning on and off the system, we also invited each non-teaching librarian to become familiar with the interactive features.

The last group we targeted for training was faculty members who regularly make use of the library classroom and may therefore be interested in learning how to use the IWBs for more than the traditional on-screen projection only. When making a booking, a faculty member is offered training. If willing, the instruction coordinator or systems manager meets with them for an individual session. The names of trained faculty are put on a list so that they can check out the stylus otherwise unavailable.

The initial training described above will be supplemented by future workshops that will add new interactive features. We also plan to have sessions during which librar-

ians share the new teaching methods they developed as a result of working with IWBs. [Appendix 1](#) features a sample of workshop activities we designed in order to take advantage of the IWB's features.

ASSESSING THE IMPACT OF IWBs

After two semesters of teaching with IWBs, we decided to poll our colleagues about their experience with the new technology. We hoped that two terms provided sufficient time to become comfortable using the IWBs and to feel emboldened to experiment with teaching styles and lesson plans. Curious as we were about the most utilized features and teaching innovations, it was also crucial for us to identify any need for repeated or additional training.

Lloyd Sealy Librarians

An anonymous six-item questionnaire ([see Appendix 2](#)) was distributed electronically to teaching librarians during the 2015 spring semester. The questionnaire was designed to determine which IWB's features were being used, record the number of librarians who have received formal training, collect initial feedback and samples of teaching activities, as well as to gauge the level of interest in different training methods in the future. Out of twelve teaching librarians on staff, nine responded (75% response rate). More than half of the respondents (55.6%) said they are comfortable using the IWBs, while approximately a quarter (22.2%) are only somewhat, and a quarter (22.2%) are not comfortable at all. Six respondents indicated which IWB fea-

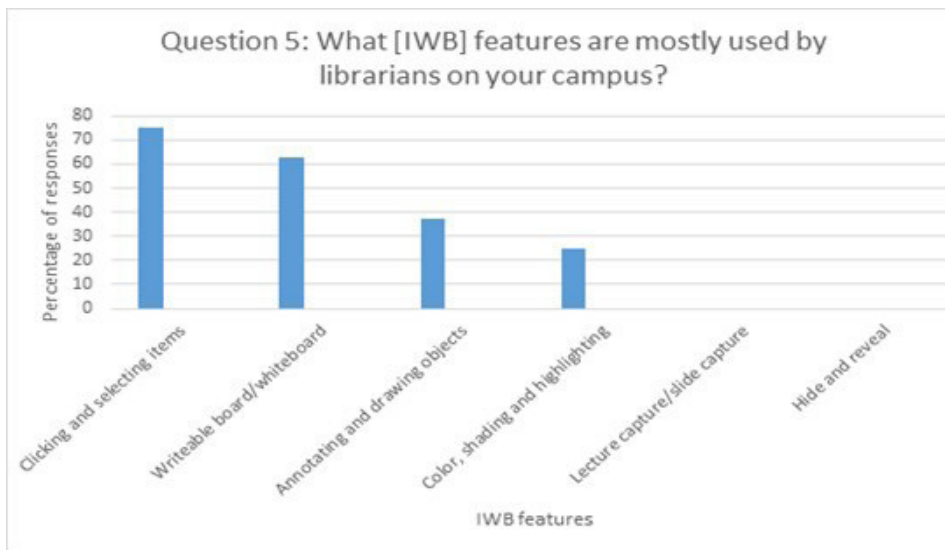


Chart 2: Interactive features used by instruction and information literacy coordinators across the CUNY system.

tures they use (Chart 1), with most (83.3%) indicating they use the writeable board as well as the click, select, annotate, and draw features. All of the respondents would prefer to attend additional training in-person, while 25% would also be interested in online training.

In addition, respondents were asked to describe any special IWB activities they use to engage students and comment on their overall experience with the IWBs. We received a wide range of responses. One respondent uses the multiple IWB screens to simultaneously demonstrate and compare features in different databases. Another commented that touching the IWB screen to open and close links and tabs is easier for students to follow than trying to track a mouse's movements. One respondent suggested that teaching librarians create a shared file of lessons and activities. Another noted the need to practice using the boards ahead of time and to rethink teaching tactics. One noted some of the drawbacks of the IWBs, such as the delayed response time of the interactive stylus and advanced tools that are too complex for occasional users to master.

The feedback revealed that, given the varied comfort levels with IWBs, more hands-on training is in order, if only to master the technical aspects of the technology. Furthermore, it became clear that we should also invite librarians who found new ways to teach with IWBs to demonstrate their techniques to the rest of us. Seeing how others work with IWBs, as one respondent suggested, may be an effective way to encourage innovations among all the teach-

ing librarians. As a result of issues raised by these questionnaires, a shared file of IWB lesson plans for library instruction will be created, featuring, among others, classroom activities included in Appendix 1.

In addition, efforts will be made to offer face-to-face training on a regular basis — some on basic instruction and some introducing advanced features, such as hide and reveal and drag and drop. With only two semesters of teaching experience using the new IWBs, our instructional strategies have been changing gradually as we become more comfortable and familiar with its features and potential pedagogical applications. Currently, functions, such as clicking and selecting items using the IWB stylus, and tools, such as drawing, annotating, and highlighting, are being used to enhance our sessions and maintain student interest. Some of the sample learning activities in Appendix 1 require students to use the IWBs to present their findings to the class. To date, students have been fascinated by the IWBs and are curious to use them. Gradually, we will be devising similar engaging learning activities.

Coordinators of Library Instruction across CUNY

Since John Jay College and the Lloyd Sealy Library are a part of the CUNY system, we also wanted to get a sense of IWB's use by other libraries in the system. Accordingly, an eight-point questionnaire was sent electronically to library instruction and information literacy coordinators across the CUNY system. Eleven out of twenty-four coordinators responded (46% response rate). Of the

institution types represented by the pool of respondents, four were from community colleges, six were from senior colleges, and one from a graduate-level institution.

More than half of the respondents (54.5%) confirmed that their libraries have IWBs. Slightly less than half of the respondents have received training in using IWBs (45.5%). Among the respondents who received training all had in-person training, one had online training, and one was self-taught. Chart 2 summarizes the IWB features used by CUNY librarians at large. A large percentage of librarians use the click and selection features (75%) along with the writeable board (62.5%). Respondents did not share any lesson plans or special IWB activities. In the future, 100% of respondents said they would attend in-person training while 20% said they would also prefer online training.

The data gathered in the questionnaire are consistent with findings in the literature: IWBs are more widely used at lower grade levels. Indeed, our CUNY data show that more community than senior colleges are using IWBs and that the graduate school is not using them at all. The lack of ongoing training was consistently identified as a shortcoming, and our data reveal that after receiving initial training those skills must be consistently reinforced with practice and with more training, especially for librarians who may have lots of breaks between teaching sessions. Furthermore, using the IWB as a life-sized touchscreen — using your finger or a stylus — is easiest and was identified as the way a majority of our respondents interacted with them. Using more advanced features, such as hide and reveal, takes more training and practice. Surprisingly, many of our respondents were able to make use of the writeable board in conjunction with the projected computer screen. Manipulating back and forth between these two screens takes a fair amount of skill and should bode well for learning other, more advanced features.

Assessment of IWBs: Next Steps

After a few more semesters of teaching with the IWBs, we plan to follow up with another questionnaire related to librarians' use of the boards. Importantly, we also plan to assess student learning. According to Houlihan and Click (2012), assessment involves measuring the skills or knowledge that students acquire following an instruction session. Surveys are a popular assessment tool distributed at the end of class,

» **The Lloyd Sealy Library experience shows that IWBs are a useful—if underutilized—classroom technology that other academic libraries should consider adopting. IWBs meet the versatile needs of library instruction. By taking advantage of IWB’s varied features, librarians can readily reshape and improve the ways and formats in which they teach research skills.**

but Choinski and Emanuel (2006) remind us that they often capture user satisfaction and not learning outcomes.

The library literature is limited in terms of assessment methods for one-shot sessions and even more limited when it comes to assessing teaching technologies such as IWBs. Knight (2003) summarizes the positive student reactions to IWBs in an academic library but does not address any outcomes-based assessment. Other authors have written about the benefits of using pre- and post-tests to assess library instruction sessions (Bryan & Karshmer, 2013; Houlihan & Click, 2012). Bryan and Karshmer (2013) write that, while pre- and post-tests contain the same questions, the pre-test is issued at the beginning of a class to establish a baseline of knowledge. The results of the pre-test are then compared with results from the post-test, the post-test being issued at the end of class. We may consider issuing pre- and post-tests to a randomized sample of first-year classes. To establish a control group, a randomized sample of first-year classes would be selected to receive instruction using only projected images and a chalk board. We would then compare the results of the pre- and post-tests for both types of classes.

SUMMARY

The Lloyd Sealy Library experience shows that IWBs are a useful—if underutilized—classroom technology that other academic libraries should consider adopting. IWBs meet the versatile needs of library instruction. By taking advantage of IWB’s varied features, librarians can readily reshape and improve the ways and formats in which they teach research skills. Adding IWBs and incorporating active learning strategies into library classes and workshops foster

student engagement, a key component of effective teaching. ■

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The Provision of Mobile Services in US Urban Libraries

BY YA JUN GUO, YAN QUAN LIU, AND ARLENE BIELEFIELD

ABSTRACT

To determine the present situation regarding services provided to mobile users in US urban libraries, the authors surveyed 138 Urban Libraries Council members utilizing a combination of mobile visits, content analysis, and librarian interviews. The results show that nearly 95% of these libraries have at least one mobile website, mobile catalog, or mobile app. The libraries actively applied new approaches to meet each local community's remote-access needs via new technologies, including app download links, mobile reference services, scan ISBN, location navigation, and mobile printing. Mobile services that libraries provide today are timely, convenient, and universally applicable.

INTRODUCTION

The mobile internet has had a major impact on people's lives and on how information is found located and accessed. Today, library patrons are untethered from and free of the limitations of the desktop computer.¹ The popularity of mobile devices has changed the relationship between libraries and patrons. Mobile technology allows libraries to have the kind of connectivity with their patrons that did not exist previously.

Patrons no longer think that it is necessary for them to be physically in the library building to use library services, and they are eager to obtain 24/7 access to library resources anywhere using their mobile devices. Mobile patrons need mobile libraries to provide them with services. In other words, "patrons want to have a library in their pocket."² As a result, libraries around the world are exploring and developing mobile services.

According to the State of America's Li-

braries 2017 report by the American Library Association, the

50 US states, the District of Columbia, and outlying territories have 8,895 public library administrative units (as well as 7,641 branches and bookmobiles). The vital role public libraries play in their communities has also expanded.³ As part of the main role of public libraries, US urban libraries need to embrace the developmental trend of the mobile internet to better serve their communities. The provision of mobile services in US urban libraries is worthy of study and is of great significance as a model for how other public libraries plan and implement their mobile services.

LITERATURE REVIEW

Definition and Types of Mobile Devices and Mobile Services

As early as 1991, Mark Weiser proposed "ubiquitous computing," pointing out how people could obtain and handle information at anytime, anywhere, and in any way.⁴ With this expectation, the possibilities of using personal digital assistants (PDAs) as mobile web browsers were researched in 1995.⁵ In combination with a wireless modem, library users are able to use PDAs to access information services whenever they are needed. Today, mobile devices are generally defined as units small enough to carry around in a pocket, falling into the categories of PDAs, mobile phones, and personal media players.⁶ For many researchers, laptops are not included in the definition of mobile devices. Although wireless laptops purportedly offer the opportunity to go "anywhere in the home," laptops are generally used in a small set of locations, rather than moving fluidly through the home; wireless laptops are portable, but not mobile.⁷

In contrast, Lippincott suggested that mobile devices should include laptops, netbooks, notebook computers, cell phones,

audio players such as MP3 players, cameras, and other items.⁸ According to the "Mobile Strategy Report" by the California Digital Library, mobile phones, e-readers, MP3 players, tablets, gaming devices, and PDAs are common mobile devices.⁹ Each mobile device has its own characteristics and the potential to connect to the internet from anywhere with a Wi-Fi network, driving widespread use and thus the provision of library mobile services.

Mobile services are services libraries offer to patrons via their mobile devices. These services as described herein comprise two categories: traditional library services modified to be available via mobile devices and services created for mobile devices.¹⁰ Pope et al. listed several mobile services, including SMS or text-messaging services, the My Info Quest Project, digital collections, audiobooks, applications, and mobile-friendly websites.¹¹ The California Digital Library pointed out that a growing number of university and public libraries are offering mobile services. Libraries are creating mobile versions of library websites, using text messaging to communicate with patrons, developing mobile catalog searching, providing access to resources, and creating new tools and services, particularly for mobile devices.¹²

The most recognized mobile services in university libraries are mobile sites, mobile apps, mobile OPACs, mobile access to databases, text messaging services, QR codes, augmented reality, and ebooks.¹³ Both academic and public libraries' use of Web 2.0 applications and services include blogs, wikis, phone apps, QR codes, mash-ups, video or audio sharing, customized web-pages, social media and social networking, and types of social tagging.¹⁴

This study focuses on the two most common mobile devices, mobile phones and tablets, and on the services provided

Table 1. The survey and examples of survey results.

Contents	Options	Example No.1: Pima County Public Library	...	Example No.138: Milwaukee Public Library
Components of mobile websites	1 Account login; 2 Catalog search; 3 Contact us; 4 Downloadables; 5 Events; 6 Interlibrary loan; 7 Kids & teens; 8 Locations and hours; 9 Meeting room; 10 Recent arrivals; 11 Recommendations; 12 Social media; 13 Suggest a purchase; 14 Support	1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 13, 14.		1, 2, 3, 4, 5, 7, 8, 9, 12, 13, 14.
Components of mobile apps	1 Account login; 2 Barcode Wallet; 3 Bestsellers; 4 Catalog search; 5 Contact us; 6 Downloadables; 7 Events; 8 Full website; 9 Interlibrary loan; 10 Just ordered; 11 Kids & teens; 12 Locations and hours; 13 Meeting room; 14 My Bookshelf; 15 My library; 16 Pay fines; 17 Popular this week; 18 Recent arrivals; 19 Recommendations; 20 Scan ISBN; 21 Social media; 22 Suggest a purchase; 23 Support	1, 4, 5, 6, 7, 8, 12, 15, 18, 20, 21.		1, 4, 5, 6, 7, 8, 12, 17, 20, 21.
Mobile reference services	1 Chat/IM; 2 Social Medias; 3 Text/SMS; 4 Web Form	--		1, 3, 4.
Social media	1 Blog; 2 Facebook; 3 Flickr; 4 Goodreads; 5 Google+; 6 Instagram; 7 LinkedIn; 8 Pinterest; 9 Tumblr; 10 Twitter; 11 YouTube	1, 2, 3, 6, 8, 10, 11.		1, 2, 6, 8, 10.
Mobile reservation services	1 Reserve a computer; 2 Reserve a librarian; 3 Reserve a meeting room; 4 Reserve a museum pass; 5 Reserve a study room; 6 Reserve exhibit space	--		3.
Mobile printing	1 Mobile printing; 2 No mobile/ Wi-Fi printing; 3 WiFi printing	3.		2.
Apps or databases	1 Axis 360; 2 BiblioBoard; 3 BookFlix; 4 Brainfuse; 5 Career Transitions; 6 Cloud Library; 7 Driving Tests.org; 8 EBSCOhost; 9 Flipster; 10 Freading; 11 Freegal; 12 Gale Virtual; 13 Hoopla; 14 Instant Flix; 15 Learning Express; 16 Lynda.com; 17 Mango Languages; 18 Master FILE; 19 Morningstar; 20 New York Times; 21 NovelList; 22 One Click Digital; 23 Overdrive; 24 Reference USA; 25 Safari; 26 Tumble Book; 27 Tutor.com; 28 World Book; 29 WorldCat; 30 Zinio.	4, 11, 14, 22, 23, 26, 28, 30.		4, 8, 11, 12, 13, 15, 17, 18, 19, 21, 23, 24, 30.

to library patrons and local communities through mobile websites, mobile apps, and mobile catalogs.

Status of Mobile Services in US Libraries

Mobile devices present a new and exciting opportunity for libraries of all types to provide information to people of all ages on the go, wherever they are.¹⁵ It is generally observed that there is an increased use of mobile technology in the library environment.

Librarians see their users increasingly using mobile phones instead of laptops and desktop computers to search the catalog, check the library's opening hours, and maintain contact with library staff.¹⁶ In an earlier investigation of 766 librarians, Spires found that there was very little demand for services for mobile devices as of August 2007. At that time, relatively few libraries (18%) purchased content specifically for wireless handheld device use, and very few libraries (15%) reformatted content for these devices.¹⁷ However, a survey of public libraries

completed by the American Library Association between September and November 2011 indicated interesting changes:

15% of library websites are optimized for mobile devices, and 12% of libraries use scanned codes (e.g. QR codes), and 7% of libraries have developed smartphone applications for access to library services; 36% of urban libraries have websites optimized for mobile devices, compared to 9% of rural libraries; 76% of libraries offer access to e-books; 70% of libraries use social networking tools such as Facebook.¹⁸

Later studies revealed more significant changes. 99 Association of Research Libraries member libraries were surveyed in 2012 to identify how many had optimized at least some services for the mobile web. Apps were not investigated. The result showed that 83 libraries (84%) had a mobile website.¹⁹

A study in 2015 by Liu and Briggs showed that the top 100 university libraries in the United States offered one or more

mobile services, with mobile websites, mobile access to the library catalog, mobile access to the library's databases, e-books, and text messaging services being the most common. QR codes and augmented reality were less common.²⁰

Kim noted that "libraries are acknowledging that people expect to do just about everything on mobile devices and that more and more people are now using a mobile device as their primary access point for the Web."²¹ Although librarians may have previously underestimated what people wanted to do using mobile devices, there is a growing understanding of the potential of these access points.

RESEARCH DESIGN

Survey Samples

While a growing number of users tend to access information remotely, urban libraries, as the most popular public-sector institutions and community centers, are facing great challenges in addressing the growing

need for mobile services. The Urban Libraries Council (ULC) (<https://www.urbanlibraries.org>), as an authoritative source founded in 1971, is the premier membership association of North America's leading public library systems. ULC's member libraries are in communities throughout the United States and Canada, comprising a mix of institutions with varying revenue sources and governance structures, and serving communities with populations of differing sizes.

ULC's website lists 145 US and Canadian urban libraries. Since this study focused only on US urban libraries, 138 libraries were chosen as the study targets, and all were examined.

SURVEY METHODS

As mobile services are offered basically via wireless systems and mobile devices, a combination of research methods, including mobile website visits, content analysis, and librarian interviews, were applied for data collection. Specifically, librarian interviews were employed as a verification and supplemental process to ensure that survey data were accurate and exhaustive.

First, the authors utilized an iPhone, an Android mobile phone, and an iPad to access the websites of the 138 US urban libraries in the study sample to ascertain if these libraries have mobile websites or mobile catalogs and whether the platforms are operated properly. Then the authors checked whether these libraries have mobile apps that can be downloaded from the Apple app store or the Google Play store. The survey was conducted from June 18 to June 24, 2017.

Next, the authors went through all the mobile websites and the mobile apps the libraries provide to check the mobile services offered. The authors used a specially designed survey to collect data about each library's mobile website and app (see **table 1**). The procedure of survey content analysis was conducted between June 25 and July 24, 2017, with the examination of each library's services taking approximately 30 minutes.

Finally, for those libraries that had no mobile websites or mobile apps found through the website visits, the authors made interview requests to staff librarians via their online reference services such as live chat, web form and email. An additional purpose of this step was to confirm the accuracy of the survey data collected from website visits. The survey was conducted from July 22 to August 3, 2017.

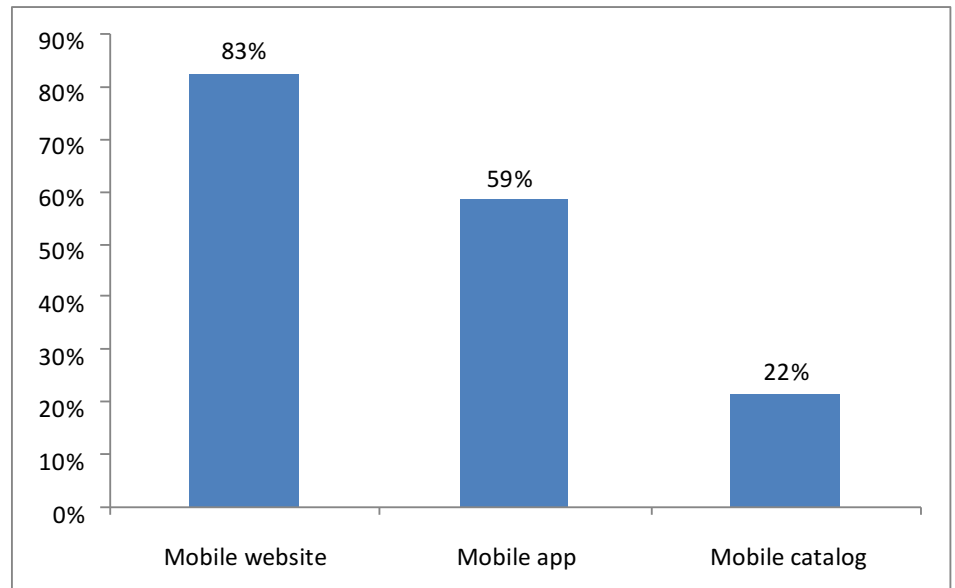


Figure 1. Types of mobile services provided by libraries.

RESULTS AND ANALYSIS

Results from the examination of mobile website visits, content analysis, and librarian interviews revealed what services US urban libraries provided as mobile services, how they were provided, and which were commonly provided.

How Many Libraries Provide Mobile Services?

Over 83% of US urban libraries have developed their own mobile websites (see **figure 1**) for communities they serve. The mobile website is currently the most popular service platform for mobile users.

Promisingly, each test of these websites through the authors' mobile devices, either smartphones or tablets, confirmed that all the study subjects can be accessed 100% of the time. These library websites, however, are not entirely built specially for mobile devices. While the majority of urban libraries have transformed their desktop websites into mobile sites with proper responsive design, about 17% are just smaller versions of their desktop websites (see **figure 2**).

A responsive mobile website can react or change according to the needs of the users and the mobile device they're viewing it on to achieve a good layout and content display. Here, text and images change from a three-column to a single-column layout, and unnecessary images are hidden. The web address of a responsively designed mobile website is the same as the desktop website. Responsive design is described as a long-term solution for addressing both designers' and users' needs.²²

The survey found that 59% of libraries

now have apps. Our analysis of the earliest version of apps records indicate that Los Angeles Public Library was the first to use an app, in August 2010. Mobile apps have advantages and disadvantages compared to mobile websites, and many libraries compared them and chose between the two. Skokie (Illinois) Public Library, as of October 2015, is no longer supporting the library's mobile app because they claim the library's website offers a better mobile experience. They also offer an easy access solution like that for a mobile app, with a message displayed to users: "Miss having an icon on your home screen? Bookmark the site to your home screen and you'll have an icon to take you directly to this site."

The proportion of libraries providing mobile catalog services is only 22%.

Libraries can use multiple options to create one or more mobile service platforms. Nearly half (46%) of US urban libraries have both mobile websites and mobile apps. According to the survey, 95% of libraries have

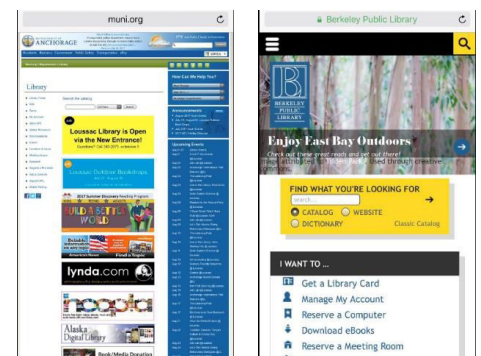


Figure 2. The smaller versions of the desktop website and the specially designed mobile website

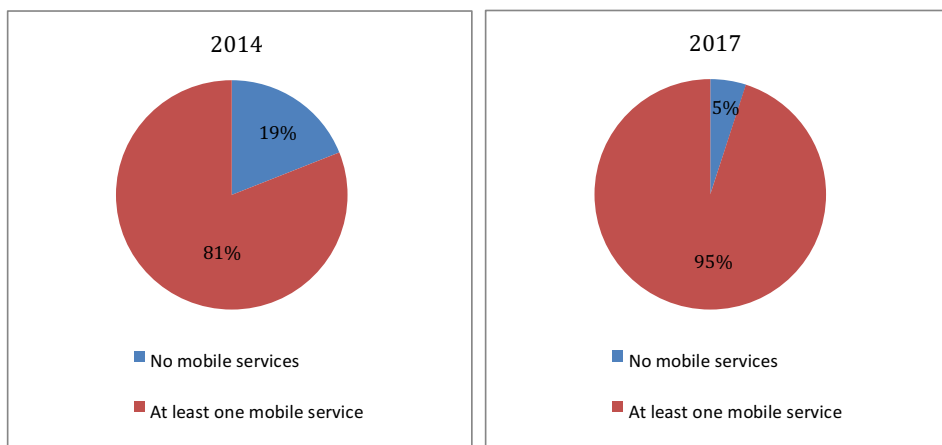


Figure 3. Changes in the proportion of libraries that provide mobile services from 2014 to 2017.

at least one mobile website, mobile catalog, or mobile app. A survey the authors conducted in April 2014 found that only 81% of the urban libraries had at least one mobile website, mobile catalog, or mobile app (see figure 3). Clearly, libraries are paying increasing attention to mobile services, and providing mobile services has become the unavoidable choice of libraries nowadays.

What Content do the Mobile Websites Offer?

Through mobile website visits and content analysis, it was found that some types of information are available at all libraries, including “Account login,” “Events,” “Locations and hours,” “Contact us,” and “Social media” (see figure 4).

The proportion of library mobile sites that offer “Support” and “Downloadables” is 96% and 95%, respectively. Among them, “Support” generally includes donations to the library foundation, donation of books and other materials, and providing volunteer services; “Downloadables” generally include e-books, e-magazines, and music.

A total of 86% of the urban libraries set up “Kids” and “Teens” sections, providing specialized information services, such as storytime, games, events, book lists, homework help, volunteer information, and college information. A majority (62%) of libraries provide interlibrary loan information on mobile websites, but one library, Palo Alto (California) City Library, no longer offers the costly Interlibrary loan service as of July 2011. More than half (56%) of the libraries set up a “Suggest a purchase” function and generally ask readers to provide title, author, publisher, year published, format, and other information in web form. Some libraries display “Recommendations” (26%) on their mobile websites. Denver Public Library has a special column recommending books for children and teenagers and offers personalized reading suggestions: “Tell us what you like to read and we’ll send you our recommendations in about a week.”

Many mobile websites will pop hints to the libraries’ mobile apps and link to the Apple app store or the Google Play store after

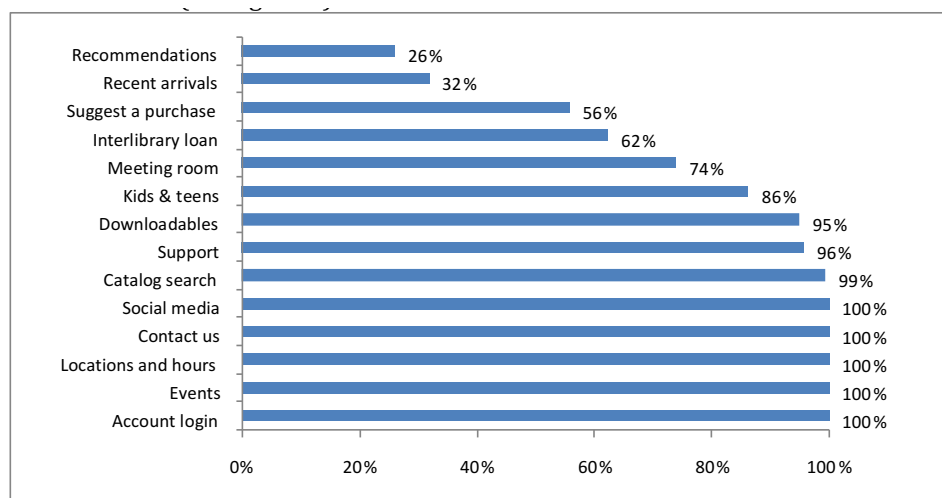


Figure 4. Components of mobile websites

automatically identifying the user’s mobile phone operating system. This is helpful for promoting the use of the libraries’ apps, and it also provides great convenience for users.

What Content do the Mobile Apps Offer?

The content of mobile websites in libraries is basically the same, but the content of their mobile apps varies widely. The reason is that the understanding of the various libraries about the functions an app should offer differs from one library to another. Some of these apps were designed by software vendors, such as Boopsie, Sirsi-Dynix, and BiblioCommoms, but some were designed by the libraries themselves, leading to the absence of a uniform standard or template for the app design.

Survey results show that only “Account login” and “Catalog search” are available in all apps (see figure 5). “Locations and hours” accounts for a high proportion of apps at 96%. The “Locations” feature in many libraries apps, with the help of GPS, helps users find their nearest library location.

About 85% of apps provide “Contact us.” Click “Contact us” in Poudre River Public Library District and some other libraries’ apps, and you can directly call the library or send text messages via email. “Scan ISBN” is a unique feature of mobile apps, and 75% of apps provide this functionality. If a library user finds a book they need in a bookstore or elsewhere, they can scan the ISBN to can see if that book is in the library’s collection.

Apps designed by BiblioCommoms all have “Bestsellers,” “Recently Reviewed,” “Just Ordered” and “My library” (See chart Figure 6). In “My library,” the “Checked Out” section contains red alerts for “Overdue,” yellow alerts for “Due Soon,” and “Total items.” The “Holds” section contains “Ready for pickup,” “Active holds,” and “Paused holds.” The “My Shelves” section contains “Completed,” “In Progress,” and “For Later.” In this way, users can clearly see the details of the books they have borrowed and intend to borrow. Apps designed by Boopsie generally have “Popular this week” to tell users which books have been borrowed more recently.

Only 3% of apps have “Kids” and “Teens” sections, which differs greatly from the percentage of mobile websites that offer those sections (86%).

What Mobile Reference Services do Libraries Provide?

According to the survey, the most common way for US urban libraries to provide mobile

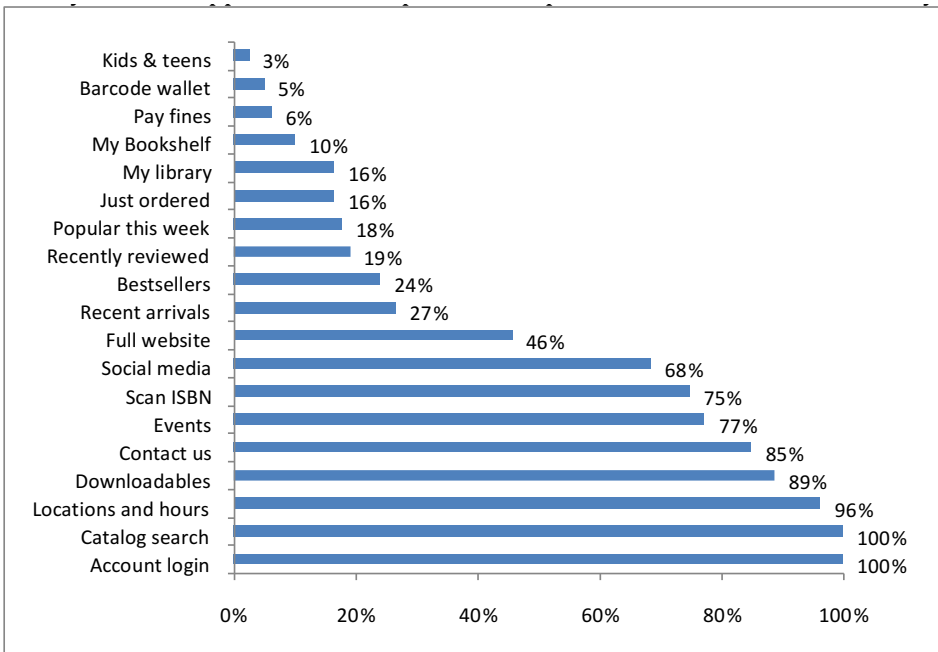


Figure 5. Components of mobile apps

reference service is a web form, which is available in 86% of surveyed libraries (see figure 7). Related to “Call us,” a web form has the advantage of being independent from the library’s working hours. Although users fill out and submit a web form, it is similar to email and, generally, librarians respond to the user’s e-mail address, but it does not require users to enter their own email system, as they only need to fill in the content required by the web form. Therefore, it is more convenient to use. The authors believe that providing only an email address is not mobile reference service.

The survey found that 6% of libraries do not have mobile reference services.

Currently, 43% of libraries offer chat and instant messaging (IM) services, which allow users to communicate with librarians instantly. For example, when Gwinnett County (Georgia) Public Library’s mobile website is visited, an “Ask Us” dialog box appears in the upper right corner of the site, which allows visitors to chat with librarians. Outside of the library’s work hours, the box displays “sorry, chat is offline but you can still get help” (see figure 8). The County of Los Angeles Public Library provides four options for IM. They are AIM, Google Talk, Yahoo! Messenger, and MSN Messenger.

All the Florida urban libraries surveyed offer reference services via the web form,

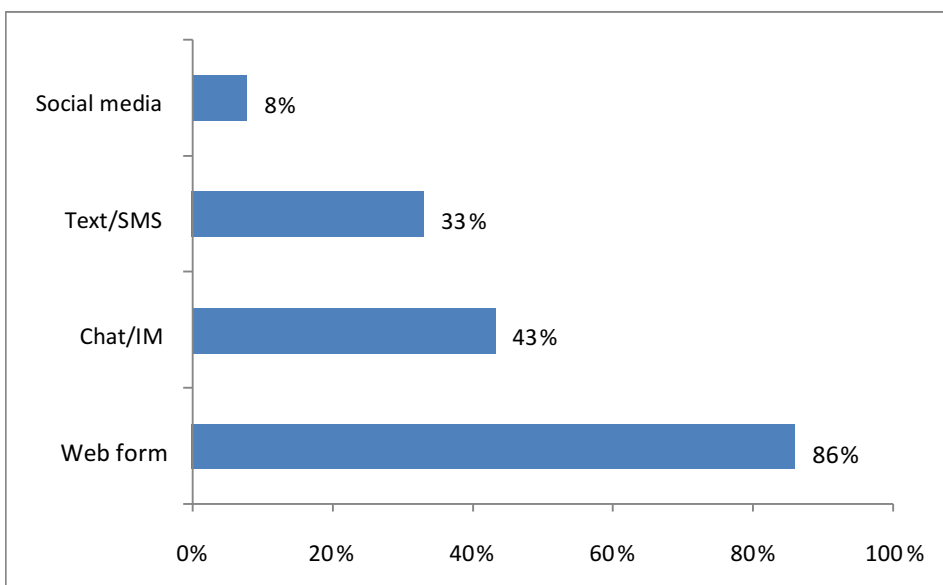


Figure 7. Mobile reference services provided by libraries.

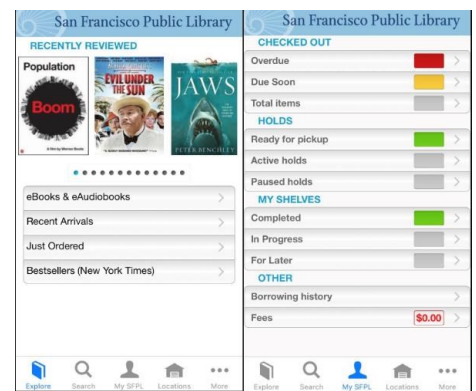


Figure 6. An app designed by BiblioCommons.

chat, and text because an “Ask a Librarian” service administered by the Tampa Bay Library Consortium provides Florida residents with those mobile reference services.

The survey shows that only 8% of the libraries provide social media reference service in “Ask a librarian.” The social media that provides reference service is either Facebook or Twitter. In fact, 100% of libraries have social media, and 100% of libraries have Facebook and Twitter, but most libraries do not use them to provide reference services.

What Social Media do the Libraries Use?

Survey results showed that 100% of mobile websites display links to their social media, usually in the prominent position of the front page of the websites; 68% of apps have social media links.

Facebook and Twitter are social media leaders, and now all libraries’ mobile websites have both (see figure 9). The survey conducted in 2014 showed that Facebook and Twitter had the highest occupancy rate, but only 61% of libraries offered Facebook and 53% offered Twitter. It is obvious that libraries have made great progress in the last three years in the application of social media.

Instagram and Pinterest are both photo social media, and they are used 76% and

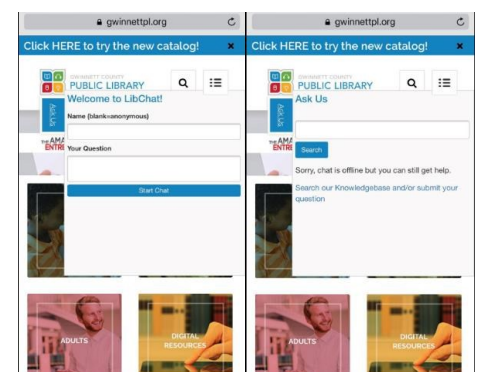


Figure 8. “Ask Us” on Gwinnett County Public Library’s mobile website

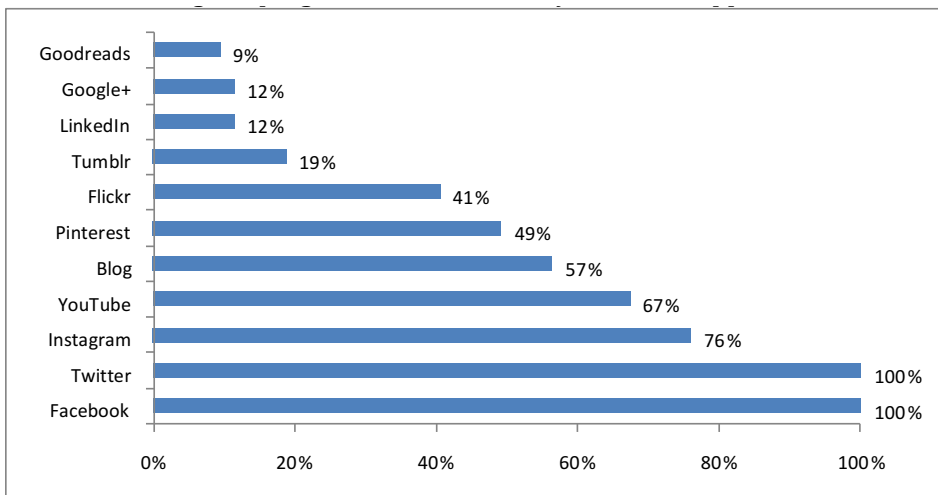


Figure 9. Social media being used by libraries.

49%, respectively. As the leading social media in the video field, YouTube is used by 67% of libraries.

What Mobile Reservation Services do Libraries Provide?

Mobile reservation services were found in 78% of all libraries' mobile services. A majority (62%) of the libraries allow online reservation of a meeting room via web form or other forms, and 14% allow reserving a study room (see figure 10). Some libraries only reserve a study or meeting room via phone.

A few libraries provide instant online access to free and low-cost tickets to museums, science centers, zoos, theatres, and other fun local cultural venues with Discover & Go. A total of 14% of the libraries provide "reserve a librarian" service, allowing patrons to reserve a free session with a reference librarian or subject specialist at the library. In addition, several libraries, such

as Pasadena Public Library, allow reserving of exhibit space.

How Many Libraries Provide Mobile Printing?

Mobile printing services allow patrons to print to a library printer from outside the library or from their mobile device. Patrons' print jobs are available for pick up at the library. Already, 43% of the libraries provide mobile printing service (see figure 11). It is expected that more libraries will provide this service.

To print from a mobile device, patrons need to download an app that supports mobile printing.

PrinterOn is the more commonly used app, which has been used by Oakland Public Library, and San Mateo County (California) Libraries, and others. However, San Diego Public Library uses the Your Print Cloud print system, and Santa Clara County (California)

Library uses Smart Alec.

San Mateo County Libraries offers wireless printing from smartphones, tablets, and laptops at all of its locations, and its wireless printing includes mobile printing, web printing, and email printing.

In addition, 14% of libraries offer wireless printing services but do not provide mobile printing services. For example, Live Oak Public Libraries in Savannah, Georgia, states that printing from laptops (PC and Mac) is available in all branches, but they don't have apps that support printing from tablets or mobile phones.

What Apps or Databases do Libraries Provide for Patrons?

Four main software programs found to be used to display e-books of the surveyed libraries are

Overdrive (93%), Hoopla (64%), Tumblebook (61%), and Cloud Library (48%). For audiobooks, Overdrive (93%) and Hoopla (64%) are the most popular; oneclickdigital is used by 48%. Most libraries (74%) use Zinio for e-magazines, and 48% use the music software Freegal. Overdrive is the most common application in libraries (see table 2).

The libraries provide users with various types of databases. Survey statistics show that the widely used databases include ReferenceUSA (business), Mango Languages (language learning), LearningExpress and Career Transitions (job and career), Lynda.com and Tutor.com (education),

Morningstar (investment), World Book (encyclopedias), WorldCat (library resources worldwide), New York Times (newspaper articles), Driving-Tests.org (testing preparation), and Safari (technology).

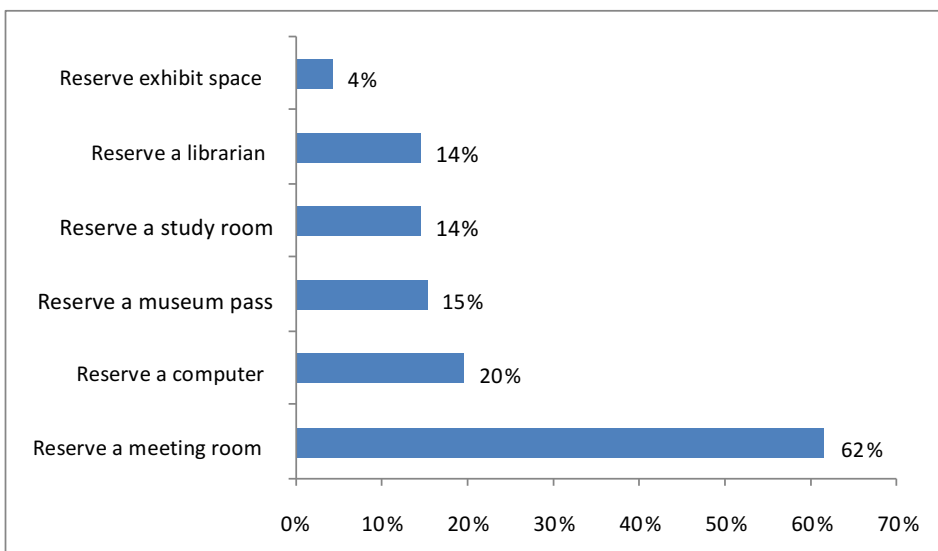


Figure 10. Mobile reservation services provided by libraries.

CONCLUSION

This study shows that mobile services have become popular in US urban libraries as of summer 2017, with 95% offering one or more types of mobile service. Responsive mobile websites and mobile apps are the main platforms of current mobile services.

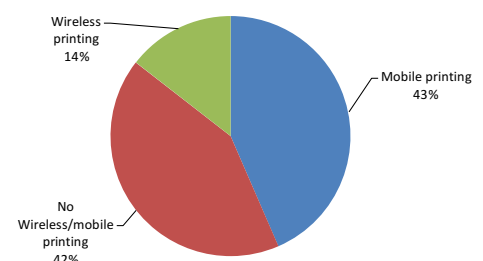


Figure 11. The proportion of libraries that offer mobile printing.

Table 2. The proportion of apps or databases being used in libraries.

Apps or Databases	% of Libraries Providing	Apps or Databases	% of Libraries Providing
Overdrive	93	World Book	46
NoveList	79	New York Times	44
ReferenceUSA	74	MasterFILE	43
Zinio	74	EBSCOhost	43
LearningExpress	69	Flipster	29
Gale Virtual	68	BookFlix	28
Hoopla	64	Brainfuse	22
Morningstar	64	Tutor.com	17
Mango Languages	61	Safari	17
TumbleBook	61	Driving-Tests.org	16
Lynda.com	57	BiblioBoard	12
WorldCat	51	Career Transitions	12
Freegal	48	Axis 360	11
OneClick Digital	48	InstantFlix	10
Cloud Library	48	Freeding	9

The US urban libraries are terribly striving to meet local community’s remote access needs via new technologies.

Compared with desktop websites, mobile websites and apps for mobile devices offer services that are more accessible, smarter and interactive for local users. Some mobile websites automatically prompt the user to install the libraries’ apps; many libraries’ apps offer the “Scan ISBN” function, making it convenient for the user to scan a book title at any time to see if it is in the library’s collection; “Location” provides GPS positioning and navigation services for users; “Contact us” can directly link telephone, text, and email.

Libraries are actively developing and adding more mobile services, such as mobile reservation services and mobile printing services. The development of mobile technology has provided the support for libraries to offer mobile services. A future world of users accessing services provided by the libraries at anytime, anywhere, and in any way is getting closer and closer. ■

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Changing the Climate

» Staff Development Activities that Address the Real Issue, Communication in the Workplace

BY DENELLE EADS

When large libraries are fortunate enough to have multiple departments where staff are assigned to carry out specific tasks within their unit, broader communication lines within the entire organization are often disconnected. This, in turn, creates a one-dimensional level of communication that often hampers the ability to have a collaborative and engaged work environment within the organization. These environments often result in work relationships that are compartmentalized, providing very little interaction across organizational departments. Transforming the workplace environment to a healthier climate that involves employee engagement and cross-departmental communication can be accomplished through the efforts of a staff development committee. This article examines the effect that an organized staff development committee has on changing the climate in a workplace where the lack of communication among employees is a barrier to creativity and productivity and is often the source of low morale. In addition, this article will provide sample activities and programs that can be used to address communication issues that occur due to compartmentalized environments within workplace organizations.

LITERATURE REVIEW

Library literature on staff development examines the effectiveness of utilizing programs and activities that enhance the organizational climate as well as communication among employees.

Although the definition of staff development is broad, it can be interpreted as a



way of advancing work-related skills or as a means of providing programs and activities used to repair work relationships for better communication; because of this, staff development initiatives are viewed as essential to any organization.

Although the purpose of a staff development committee may vary from organization to organization, the main function of such a committee is to build a foundation in which employees feel connected and in which their contribution to the work that they do is validated through upgrades of meaningful skills and personal relationships that create a healthy work environment and climate. Davis and Lundstrom suggest the following:

Most staff development committee (SDC) programs have multiple goals, however, two components of these goals remain constant. The first is a focus on skills training that keeps staff technology relevant and adept at the technologies and duties that relate to their role in the library. The second component is an emphasis on improving and building inter-library relationships. Both goals require planning, resources, and most importantly, the support of staff at all levels of the library.¹

“Success in any academic library is attributed to the staff,” state Davis and Lundstrom. They define staff training as

» **As technology advances, it strengthens the case for moving toward less personal contact among employees. The use of email, smart phones and other electronic devices reduces the lines of personal or face-to-face communication. In large organizations (like Atkins Library) that are able to hire specific staff to handle more defined tasks, communication across departments is often absent.**

implementing programs to improve overall performance in order to be more innovative as an organization and to bridge a gap between present and desired performance. In addition, Davis and Lundstrom state that staff development committees help to improve individual skills and build interpersonal relationships throughout the library and promote a culture of fun and innovation. Finally, staff development committees foster interdepartmental communication and enhance productivity.²

Gordon and Hartman believe that workplace friendships help with getting the work done and enhance the productivity of employees. They say that social relationships build trust; aiding in information sharing, organizational flexibility and increased problem solving. Furthermore, they say that workplace friendships develop coworker support, create a positive environment, and help to provide better communication among coworkers to complete assigned tasks.³

Employees use the “follow the leader concept.” If a manager supports fun activities, staff will do the same. Karl et al. argue that levels of trust that individuals have in their managers and co-workers are also likely to influence their attitudes toward workplace perceptions and what they view as fun or acceptable environments. They say that trust is often connected with management in the workplace and it can only occur if it is encouraged and respected from the top. Organizations can only expect a certain level of trust when management takes control and sets the tone, supporting it when necessary.⁴

Dennis and Reina suggest that relationships develop through leaders demonstrating a strong sense of trust in people. In addition, they state that the practice of communicating trust helps a leader understand people better.⁵

Staff development committees provide

a way for employees to connect to the organization on a personal level, which takes the concept of work to another level. It means more than just showing up for work, according to Donovan and Figueroa.⁶ They state that library managers can use staff development to involve employees in departmental projects that benefit employees by helping them to feel more involved and invested in the library as an institution unto itself. In return, staff involvement becomes deeply rooted in the tasks that keep the organization functioning.⁷

Group work, such as what occurs with staff development committees, builds communication skills which result in a more effective and meaningful organization, according to Jennerich.

She states that committee work involves communication skills of all types, including skills such as managing meetings, working on task forces and gaining experience with facilitation tools that help groups reach consensus and decisions.⁸

Rockman argues that staff development activities that are considered fun make the work environment one which provides relaxation, laughter and a positive atmosphere to the organization. She explores how the following activities can enhance the work environment: sports tournaments, dress-up days, award ceremonies, contests, learn-at-lunch sessions and food-related events. These are all activities that promote workplace communication and engagement. Providing fun staff development activities can contribute to high workplace morale and a productive library. In addition, she suggests that when organizations recognize the importance of humor, fun, teamwork, and camaraderie, a powerful message is sent to employees and patrons. She argues that personal attitude and motivation has a great deal to do with work performance.⁹ Karl and others agree, supporting the notion that fun plays a big

role at work and is essential for enhancing employee motivation and productivity, reducing stress, and increasing customer satisfaction.¹⁰

WORKING AS A TEAM

As technology advances, it strengthens the case for moving toward less personal contact among employees. The use of email, smart phones and other electronic devices reduces the lines of personal or face-to-face communication. In large organizations (like Atkins Library) that are able to hire specific staff to handle more defined tasks, communication across departments is often absent. When organizations lack cross-departmental communication, workflows tend to lead to specific departments working independently of each other, which segregates relationships across the organization. Building a healthy work environment takes collaborative work relationships within the organization and results in higher productivity. Those relationships can be built from staff development programs or committees that are made up of various departments and professional levels of the entire library staff.

J. MURREY ATKINS LIBRARY

Atkins Library (University of North Carolina at Charlotte) created a Staff Development & Activities Committee to help solve communication problems between departments as well as to increase communication among library staff. In essence, the committee was charged to provide programs and activities to get staff to start talking to one another and to begin working together and functioning as a team. Like Davis and Lundstrom suggested, Atkins Library’s goal fell under the category of relationships. The committee identified a quality in the organizational structure that needed to be repaired, and that was communication. While focusing on the organizational climate of the library,

» When libraries have large staffs with multiple departments and units, it is difficult to keep the organizational climate one that operates in an inclusive manner which promotes interdepartmental communication and interaction among the entire library staff.

the Staff Development & Activities Committee created programs and activities that would encourage interaction between staff members by facilitating both professional development and team building activities.

STAFF DEVELOPMENT ACTIVITIES AND PROGRAMS

Coffee Conversations—This staff interaction event encourages communication among the entire library staff. It is a time to chat with colleagues and get to know each other over a cup of coffee or tea in a relaxed environment.

Out of the Box—This social event is designed to get staff to take a break from their everyday routine of eating lunch alone. The event encourages employees to get away from their desks and have lunch with fellow library employees. Staff participating in this event have gathered together to have lunch at various campus venues such as the campus gardens, staff and faculty dining halls and the Student Union.

Let's Talk Tech—This event encourages staff to meet with the Technology and Digital Strategies department to discuss technology related to the library and technology in our everyday lives.

Getting to Know You—This meet and greet event matches up library faculty and staff who want to get to know their co-workers. Participants of this activity meet in pairs for lunch, over coffee or at a neutral meeting place to chat about whatever subject they choose.

Self-Selected Group Development—This activity is designed to connect staff members who may share similar interests. The idea is to have staff identify any skill or interest they would like to pursue and see if other staff are interested in the same thing. They may have different purposes or goals for the skill but would like to learn and practice it together. With this activity, the Staff Development and Activities Committee offers a framework for meeting up with staff to complete a common goal. Some of

the common interests include music, health and exercise, writing, knitting, learning a different language and home brewing.

The Welcome Wagon—This onboarding activity pairs new employees with existing employees as a way to help new hires become acclimated to their new workplace. Members of the Welcome Wagon have one primary role - to help new staff members feel welcome and comfortable at Atkins Library. Welcome Wagon members are asked to invite new employees to have lunch and/or coffee with them within their first month on the job. The Welcome Wagon activity serves as a relationship builder among library staff.

CONCLUSION

When libraries have large staffs with multiple departments and units, it is difficult to keep the organizational climate one that operates in an inclusive manner which promotes interdepartmental communication and interaction among the entire library staff. With the implementation of a staff development committee, communication issues among departments and staff working across various areas can be alleviated, making the work environment a place that encourages trust among employees and resulting in a more productive staff.

Based on the library literature on staff development initiatives, having such programs and activities in an organization has a positive impact on the entire library. As staff begin to interact through casual social settings, relationship building occurs and transforms the once segregated organizational units and departments into unified ones that blend departments in a way that employees are working, interacting and communicating as one. Implementing staff development programs and activities in organizations adds a unique component to the organizational foundation that reflects personal overtones in the work environment that soften the work climate. This allows employees to feel cared for, appreciated and motivated to perform in a positive

manner, resulting in a healthy and productive work environment. Staff development initiatives do exactly what the title states, they develop staff to be the best that they can possibly be by emphasizing the positive impact that various forms of communication have on the workplace. With any organization, small gestures such as socializing, talking and mingling go a long way in terms of building a solid foundation to a positive organizational climate. Staff development committees and programs can provide the key to productivity, happiness and a healthy work environment. ■

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