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RESEARCH IN PRACTICE

THE INTERNET AND THE EVOLUTION OF LIBRARY RESEARCH: THE PERSPECTIVE OF ONE LONGITUDINAL STUDY

Paul T. Jaeger,¹ Kim M. Thompson,² and Jonathan Lazar³

Introduction

The impacts of the Internet on library services and information usage since the advent of the World Wide Web have been significant, changing patron expectations for libraries, the ways in which libraries can reach patrons, the amount of information available, the job requirements of librarians, and the roles that libraries can play in their communities in times of need, among more prominent changes. A recently published book—*Public Libraries and the Internet: Roles, Perspectives, and Implications*—documents this fifteen-year evolution of both libraries and the Internet in terms of the effects on different user groups, library professionals, communities, governments, and the libraries themselves [1].

Given the enormous impacts of the Internet on public libraries, it is not surprising that a great amount has been written about these impacts in both the academic and professional literature. The Public Library Funding and Technology Access studies (previously known as the Public Libraries and the Internet studies), a national survey of public libraries conducted biannually and then annually by John Carlo Bertot, Charles R. McClure, and collaborators since 1994, are the longest running studies in this area, but the number of related studies has grown along with the presence of the Internet in libraries.⁴ A 2010 article by Bo Kinney provides an extensive

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4. More information about the studies and study reports are available at <http://www.plinternetsurvey.org>. All study reports and data from the studies mentioned in this article are available on this website.

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overview of many of the studies conducted about public libraries and the Internet through the years [2]. A previous Research in Practice article even discussed the ways in which the Internet has changed the practice of conducting library research using survey methods in the years prior to the Internet [3]. However, the evolution of library research itself, in light of the changes wrought by the Internet on both library and on research, deserves further consideration.

For instance, as the services provided by a library have expanded from primarily patron visits and checking out materials to provision of computer and Internet access, this has led to important changes in how library services are measured. Simply looking at the number of people who physically visit a library to check out materials would be insufficient. Many library services are provided now through databases provided to library patrons over the Internet, as well as electronic services at the libraries themselves. While libraries are providing more services to the public than ever before, if 1994 metrics were used to measure 2010 library services, it would look like services provided had actually decreased. Nationally, the size and usage of the collections of print materials in most libraries has been decreasing during that time span. The model for public library metrics may need to move to the types of metrics used by libraries for the blind and physically handicapped, where many patrons actually do not visit the library but access services electronically and through the mail.

This Research in Practice article will consider the coevolution of the Internet, public libraries, and public library research through the lens of the historical evolution of the methods of the Public Library Funding and Technology Access study. The three authors of this article bring a unique focus to the topic, having collectively worked at various points on most of the iterations of the study over its more than decade and a half of existence. Through their various tenures as graduate students or collaborators on the study, they have worked through the study being conducted entirely through the mail, being conducted through a hybrid of mail and the Internet, to having been exclusively online for several years now. Encapsulated within the changes to this study are the examples of the added capacity that the Internet has brought to library research but also the increasing complexities of library research in the Internet environment. Given the sizable interrelated changes to public libraries, the Internet, and library research in the past fifteen years, these changes should be documented for purposes of history and to learn from in future research. This article will not address the actual longitudinal changes in libraries and their technology documented in the study data as that has been comprehensively addressed elsewhere [4].

Pre-Web Days: The Early Years

The Public Libraries and the Internet studies began in a technological environment that seems like much more distant history than it actually is. In 1994, the Internet was just about to burst from the obscurity of usage by primarily universities, research facilities, and government agencies by the introduction of the system for providing hypertext access to information anywhere on the Internet now known as the World Wide Web. In the pre-web environment, library use of the Internet was limited, with databases primarily being available as dial-up Bulletin Board Systems (BBS) and network connections relying on primitive systems with names like Archie, Veronica, and Gopher. The Clinton administration began the process of federal government investment in infrastructure to facilitate Internet access for schools, libraries, hospitals, and other public institutions through the National Telecommunications and Infrastructure Administration (NTIA) and the Universal Service Fund. As part of these activities, then Vice President Al Gore suggested that public libraries be used as a means to extend equitable Internet information and services to the general public. In response to a mandate from the now-defunct US National Commission on Libraries and Information Science (NCLIS) to better understand and meet the nation's information needs through equitable information service, John Carlo Bertot, Charles R. McClure, and Douglas L. Zweizig began the study of the degree to which the Internet had been adopted in US public libraries.

In the pre-web environment, there was no indication that the Internet would achieve the roles that it now plays in society. Although America Online (AOL), Yahoo!, and CompuServe would soon make the web available to those with a phone line and the funds to subscribe to an Internet service provider, the difference in the technological environments of the first study and now can be seen in several key elements of the study. The 1994 report indicated that 20.9 percent of public library systems had a Internet connection and that few of these libraries offered public access to the community. Internet use was largely reserved for reference services, access to federal information, and technical library procedures. The report also notes that most libraries with Internet access were in larger communities, and the research team recommended federal assistance for public Internet access in public libraries. In spite of what now seems like low levels of access and limited amounts of content, they were actually quite ambitious in context—most electronic information was being exchanged through e-mail and antiquated technologies like Gopher and BBS.

The 1994 study was conducted by the researchers in conjunction with the NCLIS Advisory Board. The study was originally publicized by postcards to library directors in the sample, letters from NCLIS, and advertisements

in publications like *Public Libraries* and *Library Journal Hotline*. The surveys were mailed out with self-addressed stamped envelopes for return of the completed survey, though some surveys were sent and returned via fax. Phone and fax were used to encourage participation. The returned surveys were entered to a database for analysis.

These methods were continued in the 1996 survey, though the 1996 study also offered the first glimpse of the Internet in the administration of the Public Libraries and the Internet study. Survey questions and procedures were sent via e-mail in some cases, while libraries with access to a graphical user interface (GUI) had the option to complete the survey online. The 1996 survey found 44.4 percent of libraries to have an Internet connection. These rapid increases in Internet availability in public libraries paralleled the explosion of public interest in the World Wide Web and in the emphasis on increased telecommunications capacity and usage by the federal government, reflected in the passage of the Telecommunications Act of 1996 and the Library Services and Technology Act.

The American Library Association (ALA) began supporting the survey in conjunction with NCLIS in 1997, and the type of stratification used changed from regional to metropolitan also changed in 1997. To help coordinate the 1997 survey, the study team began a listserv to disseminate updates to state data coordinators and the advisory team about survey completion rates and other issues. By 1997, 72.3 percent of libraries had Internet connections, but only 60.4 percent of library systems had Internet access for the public. However, these statistics sound more positive than they actually were. For instance, in 1997, only 9.2 percent of public library systems provided graphical web access to patrons at both the main system library and all branches of the library.

In 1998 the sample size expanded again as the focus of the study shifted from Internet access in library systems to access in individual library outlets (the individual library buildings). This shift in unit of analysis was facilitated by the increased computing and data exchange capacities increasing the capacity for merging and analyzing data. This shift allowed the study to better represent usage of the Internet through clearer portrayal of point-of-use statistics and levels access to specific services and resources in different communities.

When library outlets were surveyed in 1998, 83.6 percent of library outlets had Internet access, but only 73.3 percent had Internet access for the public. The terminology and focus of the 1998 questions evidence the great technological changes of even the past twelve years. In the 1998 study, the adequate level of bandwidth was defined as "being able to connect at 56kbps allows users to make effective use of graphic and multimedia content on the World Wide Web" [5, p. 8]. Questions still addressed graphical web access (vs. text-only), dial-up access, newsgroups, and other terms

that today would be unthinkable. The impacts of technological change on library services became evident in the 1998 study, which was the first to have an entire section of the report devoted to the use of filtering software and acceptable use policies.

From Paper to Digital: The Transition Years

The surveys between 2000 and 2002 represented two major transitions in the life of the study. First, the 2000 study was the final year that the data were collected through a hybrid of mail and online methods, while the 2002 study was the first study where the data were collected exclusively online, though phone calls to nonresponding outlets were also employed to help with the transition to the online survey. Second, these years were the final years that the study was partially supported by federal funding—from both NCLIS and the Institute of Museum and Library Services (IMLS). Beginning in 2004, the study would be entirely supported by funding from two major nonprofit entities—ALA and the Bill and Melinda Gates Foundation.

A close look at the questionnaire shows continuities as well. As the levels of Internet connectivity in public libraries continued to grow, so did patron demand for Internet access and the range of innovative uses that libraries were finding for their Internet connections. The 2004 study was the first to ask questions about broadband usage and wireless access in libraries, for example. The 2004 study also found that nearly all libraries now had Internet connectivity—99.6 percent. This plateau of approximately 99 percent has been maintained by libraries ever since. The 2004 study also signaled a sizable increase in sample size and in the number of responses to the survey over previous years. In 2002, there were 1,500 libraries in the sample, of which 1,100 responded; in 2004, there were 6,865 libraries in the sample, of which 5,023 responded. This expansion of the sample size and a redesign of the sampling method were driven by the desire to provide data that were representative at both the national level and for each individual state. These changes also reflect both the growing intricacy of the survey and the growing importance of the Internet within public libraries. Over the years, the sampling frame would become increasingly precise as technology facilitated the merging of existing data sets of library demographics and the geocoding of individual library outlets.

These years found the study needing to address a growing range of policies related to the Internet that were passed by the federal and state governments. In the years around the turn of the millennium, the US Congress passed such major legislation related to the Internet as the USA Patriot Act, the Homeland Security Act, the Library Services Technology Act (LSTA), the E-Government

Act, the Children's Internet Protection Act (CIPA), the Children's Online Privacy Protection Act (COPPA), and Section 508 of the Rehabilitation Act, all of which would have an impact on the ways in which libraries could provide Internet access to their patrons. The impacts would be reflected not only in the services that libraries could provide to their patrons but also in the issues that the study would have to address.

The impact of the study itself also became clear in these years. While the Public Libraries and the Internet study was by then established as the only longitudinal study on the topic, the study data became the source of many of the most widely quoted statistics about public libraries both in the media and among library professionals. News reports about the release of new study findings became commonplace in professional literature and in mass media outlets. Since 2002, stories about the study's findings have appeared in such newspapers as the *New York Times*, the *Chicago Sun Times*, the *Washington Post*, the *Boston Herald*, the *Seattle Post Intelligencer*, and the *Sydney Morning Herald*; journals such as *Forbes*, *Governing*, *Government Technology*, *Business Week*, *American Libraries*, *Library Journal*, *Nature*, and *Newsday*; and such broadcast outlets as National Public Radio, MSNBC, and Fox News.

The study data also became widely respected within government circles. The study earned its own table in the annual *Statistical Abstracts of the United States*. When the US Supreme Court held that the CIPA was constitutional, the Public Libraries and the Internet study was referenced by the majority on the first page of the holding. The study data has even made appearances in legislation, with the data being cited as justification for the proposed renewal of the E-Government Act in 2008.

Increasing Scope and Impact: The Recent Years

The years since 2005 have marked another increase in the scope of the study, reflecting the continually increasing importance of the Internet as a foundational element of public library services. One way that the study has expanded is in frequency, the study being conducted annually beginning in 2006. The study has also expanded in data collection methods, in depth of questions, and the range of Internet-related library roles and activities that must be addressed by the study. During this time frame, the Public Libraries and the Internet study was rechristened the Public Library Funding and Technology Access study in 2007 to acknowledge the expanding scope of the research.

The 2006 study featured a significant broadening of the methods used to collect data. Site visits were added in 2006, with researchers visiting thirty libraries in five states to gain qualitative data that would provide insight into the operational issues of the Internet in public libraries. The

type of information gathered with the survey also changed, with the closed survey questions now complemented by an open-ended question to provide libraries the opportunity to discuss any issues they wished at any depth they wished in relation to the impacts of Internet and public access computing. An impressive 3,887 libraries responded to the open-ended question. The open-ended question helped to bridge the findings from the quantitative data and the site visits.

The addition of site visits and an open-ended question immediately paid significant dividends in revealing new roles for public libraries in providing Internet access and related training and services. The release of the 2006 study coincided with two major events that reoriented the public library and the Internet access it provides in the minds of member of the public and the planning of governments [6–8]. First, around this time, libraries around the country were becoming the primary access point to reach e-government for those with insufficient other means of access and those who wanted help using e-government, spurred heavily by Medicare's prescription drug program sign-up being done through their website. The second event was localized to the Gulf Coast states, where a series of major hurricanes—including Katrina, Rita, Wilma, and Ivan—devastated the region. Following the hurricanes, public libraries used their computers and Internet access to take a leadership role in helping people complete Federal Emergency Management Agency (FEMA) and insurance forms, search for missing loved ones, distribute relief materials, and perform other vital recovery activities. Together, the ability to provide the technology for and the training and assistance related to e-government participation and the emergency response and recovery roles that connected libraries could facilitate served to cement the relationship between public libraries and the Internet in the public perception, and the study was able to document these events.

In 2006, Internet connectivity in libraries was 98.9 percent, with that number increasing to 99.7 percent in 2007 and then returning to 98.9 percent in 2008. No major changes to the methods of the study were introduced in 2007 and 2008, but the study data continued to spread in usage and impact. The most notable development in the dissemination of study findings occurred in 2007, when ALA began to annually publish the study results in book form, along with associated interpretation and related ALA data, under the name *Libraries Connect Communities*. In 2010, a website (<http://www.plinternetsurvey.org>) was launched to provide all of the study reports through the years, as well as specialized materials derived from the study data—such as topical reports, handouts, charts, and interactive materials—to help libraries demonstrate their impact in their communities through the provision of Internet access and education.

The 2009 study introduced another methodological expansion of the study.

Along with the general survey of all public libraries, a specific group of libraries was required to participate in questions related to grant funds they were receiving from the Gates Foundation. These questions helped to understand how the external funding was being employed to improve Internet access and services in the recipient libraries. The 2010 study continued in this same format, while introducing an expanded range of open-ended questions. These years also added a further dimension to the study results. While the study had long focused primarily on data collection and reporting, new ways of combining data and technology have allowed recent studies to emphasize viewing, packaging, and repurposing the data for libraries to use study findings and results in local, state, and national advocacy efforts.

As the world around and within libraries continues to change, however, the content of the questions continues to evolve. The questions in the two latest iterations of the study reflect the role of the library and its Internet access and assistance in helping people cope with the great recession. Job losses and reductions of spending power have driven many additional people to use the public library computers to search for jobs, apply for government benefits, and seek entertainment through the public library computers. The questions in the latest studies also explore the ways in which libraries are partnering with other government agencies to meet these economic needs through the Internet. The economic focus of recent surveys demonstrates the ways in which this study has successfully continued to provide longitudinal data while simultaneously accounting for rapid technological and social change affecting public libraries and their users.

The First Fifteen Years: Lessons from the Evolution of This Study

The evolution of the study—in relation to the evolution of the Internet in libraries—provides several important lessons for library research:

Changes in technology will shape the content of library research studies. The questions about technology from the first study, or even from a study five years ago, sound amazingly antiquated. The fifteen years since the launch of the first study have seen the development of broadband, wireless, mobile devices, social media, and even the World Wide Web itself. Adapting to the changing technologies used by libraries has allowed the study to document this evolution and to maintain its relevance.

Other social, political, and economic changes will also shape the content of library research studies. These fifteen years have also seen enormous changes beyond the technologies themselves. Policy has created filtering requirements and opened up possibilities of law enforcement agencies requesting all electronic records. Economic changes have driven library computer usage to unprecedented levels. Increasing uses of and expectations for technology

within society have led to changing social expectations for libraries by patrons, communities, and even governments.

Longitudinal studies can document new realities as they occur. A continuing study of an important area can lead to unexpected major results many years after the study began. The findings from this study about the emergency response and recovery roles of library technology articulated a significant new reality for libraries as these roles were developing. Similarly, the study has been able to document the rise of e-government into a central aspect of the social value of public libraries. The most recent iterations of the study are beginning to reveal the developing role of public library partnerships with other government agencies to deliver new services through the Internet [9, 10].

Technological change can increase the depth of the study. The same technological changes that have necessitated a constant evolution of the study content have also facilitated the evolution of the richness of the study. With increased capacities for merging data sets and increased power of analytical software, the study could grow in sample size and complexity, and the questions could become more detailed. With increased ability for the study to be conducted electronically, study costs could be reduced, and data could be collected, analyzed, and disseminated more efficiently.

Technological change can increase the reach of a study. The power of the Internet as a dissemination tool cannot be overstated at this point. As noted above, the study now has its own website dedicated to the distribution of study findings and materials for libraries to use in explaining their roles and impacts in their individual communities. The Internet also facilitates dissemination of messages for policy makers and the media about study findings. Sending out findings through social media—such as Twitter and Facebook—can further the reach of study data.

A long-running study can train and support many future researchers and professionals. Over the fifteen years of its existence, the Public Library Funding and Technology Access study has provided research training for literally dozens of future library researchers and professionals working in libraries and universities around the world. The three authors of this article—all of whom worked on the study as graduate assistants—are but three examples of the research training this study has provided to future faculty. The funding of a longitudinal study such as this can serve to cultivate future not just long-term library research but also future library scholars.

A long-running study can demonstrate the value of research to current professionals. A national study such as this can also educate current professionals about conducting studies and the importance of research to library operations. The library directors and librarians who annually complete the study and the state data coordinators who annually encourage libraries to participate are regularly exposed to the study and its results. As these results are widely used by many

libraries and by national library organizations, the value of longitudinal studies for libraries is reinforced by the consistency of completing the Public Library Funding and Technology Access study and using the new results when they are released.

A long-running study can inspire an entire field of research. The Public Library Funding and Technology Access study has not only been providing new data for fifteen years; it also was the first national study on the overall topic of public libraries and the Internet. In the United States, studies have focused on other aspects of the Internet in libraries, such as the University of Washington's 2010 study on the community benefits derived from the Internet in public libraries and the Pew Internet and American Life Project studies [11, 12]. Following the lead of this study, national studies on this topic have also been conducted in other countries. For example, Australian studies of public library Internet connectivity are largely state funded and state based or performed by private research consultants. In 1997, after a period of changes to library services in the Australia state of Victoria resulting from a major restructuring of local government, a research team performed a study of Internet connectivity in Victorian public libraries similar to the Public Libraries and the Internet studies to that date [13]. Not long after, the Australian Library and Information Association (ALIA) began collecting annual data sets of Internet connectivity in Australian public libraries that focus on issues of Internet connectivity, but not Internet services, in public libraries.

Although every study will feature unique attributes and experiences, the lessons above have relevance to library research about any topic—not just studies about libraries and technology. These lessons are particularly relevant for studies that are intended to be longitudinal.

For researchers, it is too often the case that the data themselves are the primary, or only, lesson from their studies. In considering the coevolution of the Internet, public libraries, and library research through the lens of the historical evolution of one study, this article has attempted to reveal the ways in which all three have changed—often changing one another—during the life of the study. The past fifteen years have been filled with major societal changes driven by revolutions in technology, and these revolutions have created many new opportunities and challenges in developing, conducting, and analyzing library research.

Studies from outside the field of LIS can also offer valuable insights that inform the evolution of library research. For example, as a comparison in the same time period, the US Census Bureau (almost certainly the largest survey effort in the United States) has changed its questionnaire approach, sampling approach, and use of web-based surveys within the same time period.⁵ In the year 2000 census, there were two different census forms: the short form and

5. See <http://www.census.gov> for more information about its studies and methods.

the long form. One in every six addresses received the long form. Americans who received the short form had the option of filling out their census form on the web, although the option was not well publicized. Respondents who wanted to fill out the 2000 census short form online were required to enter the ID number from their census paper form.

While the US Census Bureau performed usability research between 2000 and 2010 to prepare for online responses to the 2010 census, as it turned out, the 2010 US Census was not conducted in any way via the Internet [14]. To encourage responses to the 2010 census, the survey form was made as short as possible, with questions about “how we live as a nation—our diversity, education, housing, jobs, and more” moved instead to the American Community Survey (ACS), which is run annually. The ACS started in 2005 and uses a sample of approximately 3 million addresses annually, asking questions similar to those that had been asked in the 2000 long form. Individuals can respond to the ACS using the paper form, over the phone, or in person but not on the Internet.

Learning from the historical development of research methods in a long-running study can serve to help inform the development of future studies and help in the creation of new studies that are prepared in advance for the likelihood of significant technological, social, and other changes as study continues through time. As can be seen through the discussion in this article, the history of the Public Libraries and the Internet/Public Library Funding and Technology Access study provides a unique window into the recent coevolution of the Internet, public libraries, and library research. Although the study is currently scheduled to sunset after 2011, the nearly two decades of contributions that the study has made to library practice, scholarship, education, and advocacy will continue to provide important lessons to future library research.

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