Edited by
Victor R. Lee and Abigail L. Phillips

Reconceptualizing Libraries

Perspectives from the Information and Learning Sciences

RECONCEPTUALIZING LIBRARIES

Reconceptualizing Libraries brings together cases and models developed by experts in the information and learning sciences to explore the potential for libraries to adapt and transform in the wake of new technologies for connected learning and discovery. Chapter authors explore the ways that the increased interest in the design research methods, digital media emphases, and technological infrastructure of the learning sciences can foster new collaborations and formats for education within physical library spaces. Models and case studies from a variety of library contexts demonstrate how library professionals can act as change agents and design partners and how patrons can engage with these evolving experiences. This is a timely and innovative volume for understanding how physical libraries can incorporate and thrive as educational resources using new developments in technology and in the learning sciences.

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*Victor: For my kids, who always
find something interesting at the library*

Abigail: For my Dad

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In a volume like this one, gratitude goes out to the various contributing authors, as they did much of the hard work of initial writing, while our jobs involved providing reviews, feedback, and suggestions and doing a lot of wrangling. The initial

interest of various authors for such a volume to come into existence was also a driver in the preparation of this book. Special thanks go to Diana Hellyar and Elizabeth Bonsignore for being willing to step in with short notice, but we believe this book is far stronger for having them as a part of it.

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Finally, this book would not be possible without the tremendous work that is being done five, six, and even seven days a week across the country at libraries of varying sizes and in various settings, whether they are schools, cities, universities, or other organizations. As editors, we saw that all the work described in each chapter relied upon the partnership, interest, and involvement of these hardworking individuals who are seeking new ways to innovate and partner with members of their communities in order to provide access to high-quality information experiences. We would be remiss were we not to acknowledge first and foremost the various librarians and library personnel whose stories and wisdom are shared in the pages that follow.

INTRODUCTION

Victor R. Lee and Abigail L. Phillips

Throughout the United States, libraries are facing pressures to change. After all, one can just run a Google search, turn to Wikipedia, or query friends on Facebook to see what information is available and recommended. New technological infrastructures and big data algorithms seem to render library services moot, as books and other publications are being suggested to us based on what we had purchased, read, or even glanced at before. For a large part of the population, it seems that printed books have become blasé. And while libraries and library personnel have long advocated for awareness that they are informational and educational institutions and professionals, the role that libraries serve in providing learning opportunities is often overlooked by the general public. Many do not realize that libraries are regularly providing instruction, exhibits, seminars, and programs for their communities. Many do not notice that many libraries in many different locales are seeking out ways to expand and improve upon how they support learning and information discovery. Many do not realize the kinds of partnerships that are being undertaken with researchers and designers to enhance the library experience. Given that, what prominent, concrete images do we have that best exemplify the efforts to change the popular image of what is happening in the physical library? How can we spotlight the changing roles of the people who are tirelessly doing and reinventing the work involved in making libraries into vibrant, community-relevant learning spaces?

Those questions motivated the preparation of this edited book. We (Lee and Phillips, the editors of this volume) were each beginning to wonder about these within our two respective academic communities. Lee was trained in the learning sciences and has been involved in projects studying and designing for learning in a range of settings for many years and with many populations. Phillips was a former librarian who was trained in information sciences and had been studying

modern-day librarianship practices and young adult services in libraries. Funding opportunities and professional networks brought them together as colleagues in Logan, Utah, and the conversations that led to this book began.

In preparing this book, we had recognized that there were emerging success cases and new models for library-based learning that were being developed by experts in the information and learning sciences, and some dialogue between the fields was beginning. As a field, the learning sciences was expanding beyond its sociocultural and cognitively oriented design work with technology and activities in classrooms and museums and into more seriously examining a range of other settings for learning. Libraries were among those settings. The library and information sciences had been broadening its emphasis areas beyond information storage, archival, search, and retrieval and had been taking increased interest in the design research methods and digital media emphasis of the learning sciences. Documented success cases such as the *YOUMedia* program in Chicago and substantial research and development investment from organizations like the MacArthur Foundation's *Digital Media and Learning* program have motivated calls for more dialogue and collaboration between information and learning scientists. Connected learning, as a perspective on how to envision twenty-first-century, digitally enhanced, interest-driven learning, was establishing a unifying viewpoint. Leading organizations, such as the Association for Information Science and Technology, saw the arrival of a new special interest group in the area of information and learning sciences. A major conference at the International Society of the Learning Sciences saw a symposium that examined how libraries were increasingly important sites for designing computer-supported collaborative learning. Universities were beginning to hire across field boundaries, and faculty were obtaining joint appointments across information schools and schools of education. At the time of this book's preparation, a new peer-reviewed academic journal, *Information and Learning Sciences*, is set to premiere and become a venue for research at the intersection between the two fields. It seemed that this book, which would compile the research in these fields as it related to libraries, was timely and appropriate for helping to advance this dialogue.

Thus, we, the editors, began the months of work needed to identify who had been doing new research or design at this intersection of the information and learning sciences. It was through good fortune and enthusiastic response that we were able to find a number of outstanding scholars and projects that are represented in the pages that follow. As this book was being prepared, we learned about even more projects that were being conceived or had just gotten underway, and it is with some regret that the timing of this book's preparation and the launch of these new efforts were not aligned. It is our expectation that those other projects that did not get featured in this volume will later garner attention and also promote dialogue. What is included in this book, like all academic compendia, is a product of the time at which it was prepared. Moreover, at the time that we began to organize and compile this book, the intersection between information

and learning sciences was predominantly oriented toward teens and youth as the target learner population, although the potential and imperative to design for life-long learning is clearly there. That means that public and school libraries are heavily represented in this book, whereas academic libraries and digital libraries, both of which are doing innovative work, are not featured. Similarly, the maker movement, with its emphasis on creation of digital artifacts such as computer games or circuitry, was also a major topical focus. That also meant that maker-oriented activities and spaces are especially prominent in the projects that are described.

Given the collection that we had curated, we have organized the book into four major sections, described in what follows.

Part I. Reconceptualizing Libraries and Communities

Libraries are information and learning spaces from and for their immediate communities, whether those communities are schools, neighborhoods, or cities. The two chapters in this section reconsider how libraries and communities interact. The first (Chapter 1), by Victor R. Lee, recognizes that much of the research and futurist discourse has begun to imagine what we would have in the "smart and connected communities" of the future. While much of this talk has been oriented toward new efficiencies that new social and technological systems could enable to improve the use of energy, land use, transportation, and safety, Lee argues that libraries should be an essential part of how smart and connected communities support learning. The second chapter in this section (Chapter 2), by Kyungwon Koh, June Abbas, and Rebekah Willett, sets the stage for much of the work around making and makerspaces that comes in later chapters. They discuss the appearance of makerspaces in libraries and what social role they play with respect to the communities that they serve. Their chapter is situated in the current concerns and directions encouraged by the American Library Association and includes case studies of library makerspaces from Norman, Oklahoma, and Madison, Wisconsin. Koh, Abbas, and Willett also talk about implications for the preparation of library and information science educators and researchers. The combination of these two chapters provides a broad view of how we could begin to think about libraries as they expand and change their services.

Part II. Reconceptualizing Library Experiences

The second section includes four chapters that emphasize new experiences for library patrons. The first chapter in this section (Chapter 3), from Yasmin Kafai, Orkan Telhan, Richard Lee Davis, K-Fai Steele, and Barrie Adleberg, describes a project based out of the Free Library system in Philadelphia. The project involved a new way of integrating the maker movement into libraries by encouraging the design and development of interactive murals at different neighborhood branches of the Free Library. In their chapter, Kafai and colleagues describe some of the

motivation of this work and share some of the factors they had observed that led to different ways in which the murals were accessed and used to express the concerns of local youth. The next chapter (Chapter 4), by Carrie Tzou, Philip Bell, Megan Bang, Rekha Kuver, Amy Twito, and Ashley Braun, describes a community-based design partnership organized around STEAM (science, technology, engineering, arts, and mathematics) learning experiences with families in the Seattle area. The specific program they describe, called TechTales, sought to broaden the institutional focus of informal learning to include spaces such as libraries and involved processes of participatory design research that led to and continually helped refine this technology-enhanced family storytelling experience. Tzou and colleagues also distill lessons learned about how to make university researcher and public library partnerships productive and jointly oriented toward meaningful, shared goals.

Chapter 5, contributed by Elizabeth Bonsignore, Derek Hansen, and Kari Kraus, describes the practice of alternate reality gaming, which blends imagined game worlds with physical spaces. In Bonsignore and her coauthors' chapter, they describe efforts undertaken at libraries in Maryland where teens and a teen librarian undertook the challenging task of creating alternate-reality games at the library. This chapter offers a new perspective on the kinds of gaming that are possible at libraries and is instructive for those who aspire to a comparable undertaking at other library sites. Related to this theme of mixing realities, Diana Hellyar, Renee Walsh, and Micah Altman contribute a chapter on virtual, mixed, and augmented reality (Chapter 6). The authors provide some background on the resurgent interest in virtual, mixed, and augmented reality and offer a conceptual model for how these can be integrated into library interactions, whether those are related to information search or entirely new forms of visualized information. Hellyar and colleagues draw from relevant research to suggest what appears promising and where we should exercise caution as we integrate these technologies into libraries and the activities that libraries support.

Part III. Reconceptualizing Librarianship

Besides the relationship to communities and the kinds of experiences they offer for patrons, the roles and responsibilities of librarians and library professionals are also rapidly changing. This section focuses on some of those changes as observed in research from both learning and information sciences. Leading this section is a chapter by Crystle Martin (Chapter 7). In her chapter, Martin reports on partnered design experiences with librarians in Southern California who were implementing STEM programs for underserved youth using the Scratch programming environment. The main audience is researchers who wish to work with librarians and helps to make clear the types of considerations one should make about how to support librarians in realizing and creating creative programming experiences. The next chapter (Chapter 8), written by Tamara Clegg and Mega Subramaniam,

argues that librarians are being looked upon to serve as mentors for youth. This is a contrast to the model of "librarian as expert" that is what many enact after their graduate training in library and information sciences (LIS). In their chapter, they pay particular attention to the different modes of mentorship that are required now in libraries and how youth interests can and should be made into a central focus in librarianship.

Abigail Phillips, Victor R. Lee, and Mimi Recker provide a chapter (Chapter 9) that draws on research done on libraries in small towns in Utah. From two cases of innovative librarians in these communities, they argue that these small towns can be loci of innovative practice, and a productive model for thinking about librarianship is to think of modern-day librarians as "experience engineers." They identify some common attributes of the two case librarians and provide examples of novel programs and services that these librarians had offered. The last chapter of this section, by Rebecca Reynolds and Chris Leeder, is a synthetic chapter on school librarianship and its importance in school success. One important role school librarians play is in promoting and supporting inquiry and partnering with other educators. A key takeaway of their chapter is that efforts to increase school performance should intentionally involve school librarians.

Part IV. Reconceptualizing Library Research

The last major section of the book focuses on research done on and in partnership with libraries by those in the information and learning sciences. While the other chapters certainly touch upon this, the chapters in this section maintain a dominant focus on the kinds of work that can be done to inform how to jointly work on supporting and enhancing the potential of libraries to support learning. Jason Yip and Kung Jin Lee lead with a chapter on participatory design with libraries (Chapter 11). They draw upon traditions from human–computer interaction and describe codesign work using the participatory design methodology with the KidsTeam at University of Washington. This approach was implemented over multiple sessions, partnering youth with Seattle Public Library librarians, and the reflection that Yip and Lee provide includes sound advice and acknowledgment of challenges that remain to successfully maintain participatory codesign relationships but points toward an adoption of new design-thinking processes with libraries.

The next chapter (Chapter 12), contributed by Marcia A. Mardis, Faye R. Jones, Lenese Colson, Shana Pribesh, Sue Kimmel, Barbara Schultz-Jones, Laura Pasquini, and Laura Gogia reports on work from an ongoing Mixed Research Synthesis, a review method that originates from nursing and social work research. Mardis and colleagues used this method to distill the research on school libraries in order to identify hypotheses that could examine causal relationships in small-scale research–practice partnerships with libraries. Finally, continuing also with the theme of research–practice partnerships, William R. Penuel, Josephina Chang–Order, and Vera Michalchik reflect further on the nature of such work by

sharing experiences from a partnership with the University of Colorado Boulder and Anythink Libraries (Chapter 13). Anythink had sought to embrace connected learning and worked with the research team to identify problems of practice that could be addressed by research and also involve youth as researchers themselves. Theirs is a compelling case of how the connected learning approach could be replicated and evaluated in sites beyond those that represented the original success cases.

Closing

Finally, this book was fortunate to have a contribution that is part reflective and part future oriented from Beth Yoke, the executive director of the Young Adult Library Services Association (YALSA) of the American Library Association. Yoke has directly been involved in questions of research and practice in her role and was especially well positioned to prepare some closing remarks for the volume. While her thoughts and call to action are potent as they are, it is ultimately our hope that this entire collection of writings, including Yoke's contribution, accomplishes the goals that motivated the preparation of this book. Namely, we hope that this set of chapters and contributions continues to propel a dialog that is taking place between the fields of information and learning sciences and provides a current portrait of the kinds of models of relationships, experiences, librarianship, and research that lie ahead as more people become involved in the work of reconcep-tualizing libraries for the twenty-first century.

PART I

Reconceptualizing Libraries and Communities

1

LIBRARIES WILL BE ESSENTIAL TO THE SMART AND CONNECTED COMMUNITIES OF THE FUTURE

Victor R. Lee

Unquestionably, the current state of computing with handheld devices, digitally enhanced household objects, distributed miniaturized sensors, massive-scale knowledge sharing, big data, and enhanced artificial intelligence algorithms is advancing a transformation across how we work, play, and live. We have seen how this transformation has radically altered how we seek entertainment, connect with friends, and access modes of transportation. The extension of these changes is a move toward "smart and connected communities," a futuristic vision of the locales in which we live that leverages these technological advances to improve how collections of people in the same geographic area can exist in the designed and natural environment. For example, a smart community of the future may have an energy grid system that utilizes technology to identify ways that we can better harness sustainable energy sources and increase efficiencies by making suggestions for residents based on usage analytics. Or perhaps our food supply chain can be made more efficient and more responsible environmentally by forecasting food needs over time and agricultural recommendations that can be simultaneously nutritious for the end consumer and profitable for farmers and ranchers who are involved in food production. These are just some of the possibilities that we might imagine in which the means we have and are developing to obtain data, detect trends, and allocate resources could help make the large-scale sociotechnical system that constitutes a city or community more responsive and aligned to our concerns, needs, and values.

If the calls of funding agencies—both public and private—are any indication of this enthusiasm and optimism for smart and connected communities, then we should expect this to be a continuing emphasis for research, development, and public discourse for many years to come. I write this chapter as someone who has had the good fortune to be involved in some early conversations, as one of several

participants in a multiday Innovation Lab in Menlo Park, California, with research-ers and leaders from across the country to discuss the possibilities for designing and researching Smart and Connected Communities for Learning (Roschelle, 2016), and as someone whose work as a learning scientist has, in recent years, involved productive relationships with libraries as sites for learning. As a researcher, I am enthusiastic about the efforts underway to make investments in improving how communities and technology can jointly support learning. Some of these involve, for instance, tracking of utilization of STEM education programs in large urban spaces (Quigley et al., 2016) and providing youth with opportunities to develop their own countermaps of the cities in which they live (Taylor, 2017). These types of projects hold a great deal of promise for improving learning in cities and com-munities, and the findings of these projects over time are ones that will likely attract attention and interest for many in the learning sciences and community leadership.

However, at the same time, this budding area of research and development has yet to tap into the opportunities offered by our physical libraries. Libraries should play an essential role in the smart and connected communities of the future. Arguably, libraries already play an essential role in our current communities and are already instrumental in keeping us smart and connected thus far. The path forward toward a new sense of smart and connected will build upon and involve the resources and infrastructure that libraries offer today yet augment it with new sociotechnical arrangements and tools.

On the Extant Importance of Libraries

As a citizen and an academic, I have a robust appreciation of libraries. A fair amount of the work I do as a university professor that involves research, writing, and teach-ing involves trips to libraries. As a parent, the library represents a special trip for my family to see what is being newly displayed, examine various media, and run into friendly and familiar faces. When I have library fines, I personally have few qualms about paying them because I know that the cents or dollars that I owe for forget-ting my agreement to return materials on time should ultimately go to main-taining collections and supporting my library in whatever form the hardworking people whom I encounter there see fit. This appreciation and respect for libraries does not make me an expert on libraries, though. I feel it is incumbent upon me to acknowledge that my formal training is not in the library and information sci-ences, and my professional experience—some educational research collaborations notwithstanding—does not come from partaking in the professional day-to-day work of a librarian, library director, or library technician. As such, this section will offer my position on the importance of libraries to communities. Yet to a veteran librarian or a scholar of libraries, I expect that what I have to say here may lack the nuance that is involved in current discourses about libraries.

However, my observations and engagements with libraries in recent years have elevated the following features that make libraries important to their communities

along with some observations that point toward important negotiations for the future for libraries to be leveraged as a key locale for smart and connected communities.

Libraries Provide Democratic Access

By and large, libraries are accessible to anyone in the community. At a school, any teacher, student, staff person, or administrator is welcome to visit the library. In a community library, whether one is fluent in English, comes from a high or low socioeconomic status, is young or aged, is textually or computationally literate, is neurotypical or represents some aspect of neurodiversity, or whether someone even has a permanent home address are all of little concern. All can come to the library so long as they are willing to abide by the rules of the space respectfully. There are not many places of learning that can boast such status. Many museums require admission (as their funds are limited and pieced together from various sources), K–12 schools are largely populated by students and staff, community colleges and universities require admission and tuition for courses, and courses that can help with professional advancement often require some payment in order to obtain the certification that is ultimately sought. As we look at the digital age as enabling truly lifelong learning (e.g., Collins & Halverson, 2009), libraries are one of the best spaces for anyone to have access to information. While the internet has made more information available than at any other time in human history, it still requires access to a device that can render web content and connectivity that often requires payment for service. Libraries provide internet access, whether through their Wi-Fi networks or through workstations that people can use. Public librarians spend hours helping those who do not know how to use the internet or operate a computer access the information that they need online. People of all ages use the library, whether it's parents with young children, other adults, teens, or seniors.

That diversity of patronage represents a broad range of local expertise. At the same time, that diversity raises considerations of how different population segments can be best served. Different populations gravitate to the library for different reasons, and the desires each has can be in conflict. Those seeking a warm place to be may have different interests then those who are looking for a quiet place to study, who may yet have different interests from those who want to gather and play games. A challenge continually exists with respect to serving the various interests and keeping the library open and available for all interested parties who deserve access.

Libraries Provide Space

Not to be overlooked is the physical space that libraries provide. Libraries are warm indoor spaces when for some individuals there may be no other options. By

design, many libraries offer study rooms or meeting rooms available by reservation or the library can be arranged to serve as a meeting space in its entirety after hours. In my experience across the various cities I have lived or visited, it is not uncommon to find community organizations gathering in the library for a meeting. Some libraries have auditoriums to support guest lectures and presentations for larger volumes of attendees. The space between shelves offers small private spaces, sometimes with their own separate seating or study carrels. Long tables and chairs are common in libraries and can be used as a surface upon which to read, set up a laptop, study for school, fill out paperwork, or play a tabletop game. Some libraries are providing media viewing and production spaces, and versions of those may emphasize digital maker activities, while others exist as a teen space for young people to gather and hang out. Such space is a valuable resource that is not always recognized as part of the value libraries provide.

Similar to the democratic access that libraries offer, however, a challenge exists around how the norms guiding the usage of such space will be negotiated. For example, a teen hang-out space that may involve chatter and gameplay may not be conducive to quiet reading. Similarly, a room that has expensive media creation equipment may be available with the best of intentions, but if it is kept out of view or under lock and key, its potential may not be realized. Also, libraries offer space to the public, which limits the ability for any individual party or group to make strong claims to any set of resources.

Libraries House Information Experts

Librarians are professionals in the area of information search, retrieval, and storage and thus are one of the primary resources for those seeking information about particular topics or current issues. As things stand now, American society is recognizing just how important it is to be able to discriminate between accurate and trustworthy information on the one hand and information that is intentionally designed to mislead on the other. Librarians have long been and should continue to be some of our most important allies in this ongoing work. A large part of their work involves promoting information literacy and helping interested patrons in navigating the reams of information that are available within print archives. This work has extended into digital information realms, with digital librarians and cybrarians becoming prominent figures who will lead the way (Johnson, 2011).

Granted, this is a lot to ask of already busy professionals. Much of the work within a library ultimately extends beyond information expertise. However, my contention is that those who utilize these services profit greatly from it, and the more awareness and the more actively we use and ask for these services, the more we will acknowledge how important they are for our own individual learning and for our societal benefit. What I see as a challenge for the future is how the expertise in information management can be leveraged and mobilized while so many other demands are being made of library professionals. Librarians are experts on

the information around many things, but we must be careful not to expect them to be experts about the information around all things.

Libraries and Their Communities Are Mutually Constitutive

Whether the community being served is a large metropolis, a small neighborhood, a university campus, or an elementary school, the community is reflected in its library, and the library is reflected in its community. Libraries develop the unique portions of their collections based on what is produced in the community that they serve, making a trip to any library an opportunity to learn about the tastes of the local population and the history and priorities of its immediate community. This is also reflected in exhibition space, which libraries provide. The work of local artisans and community organizations appears in display cases and on walls. The work of students appears at school libraries, and as discussed elsewhere in this book, the distinctive character of a city and a neighborhood—complete with artistic styles and local concerns—appears at the library (Kafai et al., this volume). The local events and activities are hanging on bulletin boards and are expressed in the suggestions and recommendations of the personnel employed at the library. City council minutes, maps, local historical documents, and collections of local benefactors reside in the walls of the library. These collections also mean that the library is a place for the community to know what is happening and what issues are of local concern. The library is a public space for a civic debate or a local elected candidate forum. They are an investment in shared knowledge for people who will enter, and they represent the embodiment of what a community wanted or thought was worth preserving for others to discover in the future.

It itself, the library community dynamic is impressive. There are not many organizations or institutions that we can consistently rely upon that will both preserve and create the history of the people who use it. In this era of big box stores and chains, it can be hard to see the distinct character of a community. Yet the library is deeply rooted in its community and vice versa. It contains knowledge and connects information to people and people to people. If one asks how communities have already been smart and connected, libraries would have to be part of the answer. Cultivating those connections within a community is arguably one of the main reasons why we have and value libraries to this day.

Looking Forward Toward Future Smartness and Connectedness That Involves Libraries

If libraries have already served as vehicles for enriching our understandings and connecting us to information and other people, but the pervasiveness and advances of digital technology are radically altering the sociotechnical landscape, then what role, if any, should physical libraries play? That is the underlying question driving this chapter. Here, I share a few imaginings of potential futures for libraries