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# Technology Use in Rural and Urban Public Libraries

## Implications for Connected Learning in Youth Programming

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**Abstract:** Public libraries represent fertile ground for promoting connected learning. However, there is great variation in public library systems across the United States, with important implications for the way connected learning is introduced and implemented in specific libraries. This paper examines variations in the way youth-serving library staff in rural and urban library systems employ technology and enact connected learning in their youth programming. We conducted interviews with 46 youth-serving library staff working in rural (22) and urban (24) public libraries across the United States. Our analysis revealed differences between rural and urban libraries in the range of their community partnerships; the roles that their librarians and youth assume in designing, leading, and evaluating youth programs; and their sources of external support. We discuss the implications of these findings for designing professional-development initiatives that are tailored to the distinct contexts in which public youth librarians work

## Introduction

Public libraries are increasingly recognized as promising spaces to promote connected learning—learning that is interest-driven, peer-supported, and connects youth to academic and career opportunities (Hoffman, Subramaniam, Kawas, Scaff, & Davis, 2016). Libraries are well positioned to introduce their youth patrons to hands-on learning experiences that engage them with their peers and adult mentors around a shared purpose (Subramaniam, Scaff, Kawas, Hoffman, & Davis, 2018). Many libraries are discovering ways to incorporate digital technologies that enable youth to gain important skills while creating something of personal value, such as e-textiles or music recordings.

Not all libraries are the same, however. They vary in size, staffing structure, availability of resources, opportunities for professional development, and access to community partners, among other distinctions (IMLS, 2017; Real & Rose, 2017). Often, these differences are tied to geography. The set of resources and challenges experienced by librarians serving rural communities are bound to be distinct from those experienced by librarians serving suburban or urban communities. Differences in broadband access, physical space, and the sociodemographic characteristics of youth patrons will undoubtedly affect the types of youth programming that librarians choose to offer.

We extend prior work on connected learning in public libraries by investigating how youth-serving librarians and staff enact connected learning in rural and urban libraries. We interviewed 46 youth-serving librarians and staff working in rural (22) and urban (24) public libraries across the United States. We asked participants to describe their current youth programs, their use of digital and networked technologies, and the successes and challenges they have faced while creating and implementing youth programs. Our results contribute new insight into the distinct challenges associated with implementing connected learning in diverse library systems. We consider implications for tailoring professional-development initiatives to the particular contexts in which public youth librarians work.

## Related Work

### Connected Learning in Libraries

The connected learning framework centers on youth interests, opportunities, and relationships (Ito & Martin, 2013). Public libraries are spaces for informal, self-directed learning for youth from nondominant backgrounds, who have been traditionally excluded from institutionalized sources of privilege (Ito & Martin, 2013). Libraries are also social centers and technological hubs in their communities, making them natural environments for connected learning (Braun, Hartman, Hughes-Hassell, Kumasi, & Yoke, 2014; Hoffman et al., 2016). Many public libraries in the United States have embraced participatory learning, making connections across their communities, as evidenced by the proliferation of learning labs, makerspaces, teen hangout spaces, media production facilities, and community partnerships (Hill, Proffitt, & Streams, 2015; Hoffman et al., 2016). Youth-serving librarians are encouraged to move outside their comfort zones and learn new technologies alongside their young patrons, becoming colearners and collaborators instead of instructors (Braun & Visser, 2017; Martin, 2017).

### Rural and Urban Contexts for Connected Learning

In our review of existing academic and practitioner literature surrounding connected learning in libraries, we found that most attention focuses on urban libraries, leaving rural libraries with little representation (Hoffman et al., 2016). However, rural libraries represent 38% of all public libraries in the United States (Real & Rose, 2017). Additionally, rural libraries face unique challenges to implementing connected learning, including limited broadband access, funding sources, and available partnerships (Real & Rose, 2017). There is no single consensus on the definition of *rural* (Swan, Grimes, & Owens, 2013), although a 2007 ALA-APA survey demonstrates that most rural library staff describe “rural” in terms of population size, distance from a city, and/or being within an agricultural area (American Library Association [ALA], 2007). Regardless of the definition, there are clear differences between urban and rural library systems that have bearing on their ability to enact connected learning, as detailed below.

Examples of innovative connected learning initiatives tend to come from library systems based in heavily populated areas such as Chicago (Austin, Ehrlich, Puckett, & Singleton, 2014; Ito & Martin, 2013). For example, the YOUmedia program in Chicago Public Library provides a safe space for teens to explore their interests and develop relationships with peers and mentors (Austin et al., 2014). However, examples of connected learning environments in urban and well-resourced library systems are not the most fitting models for rural library staff to envision what connected learning could look like in their libraries.

Although both rural and urban libraries are important providers of Internet access for people who lack access at home, filling this need represents a greater challenge in rural areas, where fully 45% of adults are without Internet access (Horrihan & Duggan, 2015). Additionally, the infrastructure for broadband Internet in rural areas does not always exist; even when it does, it often costs more than in urban areas (American Library Association, 2016; Real & Rose, 2017).

Local governments largely fund library budgets. Since people in rural areas have lower incomes, on average, and are more likely to be retired, resulting in lower tax revenues, rural libraries tend to have smaller budgets (Real & Rose, 2017). Rural library systems also tend to be smaller than urban

libraries—90% have a single location—making them less able to take advantage of “economies of scale” such as resource sharing, training, and bulk purchasing (Miller, 2017; Real & Rose, 2017). Libraries in urban areas receive more funding from nongovernment sources. Sin (2011) speculates that this may be because these libraries have more resources to dedicate to fund-raising or grant writing, or because their patrons are more able to support the library financially.

Youth programming differs between rural and urban contexts in the United States as well. Fewer rural libraries offer formal after-school programs (26.5% of rural libraries vs. 51.4% of urban libraries) and STEAM events (19.7% of rural libraries vs. 48.9% of urban libraries); fewer rural libraries (42.6%) offer social, peer-supported events for young adults than urban libraries (78.9%; Real & Rose, 2017). Rural areas also have fewer community organizations available to partner with or receive support from. A 2007 survey reports that only 43% of rural libraries had at least one community partnership, most commonly with schools, homeschoolers, and/or daycare centers (Flatley & Wyman, 2009). Urban libraries can partner more easily with local businesses and informal learning institutions.

In light of these differences between rural and urban library environments, in this paper we seek to understand what factors have an effect on how youth-serving librarians and staff enact connected learning in rural and urban library systems.

## Method

This paper draws on work completed in the first year of a three-year project, ConnectedLib, funded by the Institute of Museum and Library Services (IMLS). The project, a collaboration between researchers at the University of Washington and the University of Maryland, and library partners at Providence Public Library, Kitsap Regional Library, and Seattle Public Library, is creating a set of continuing education modules that will introduce connected learning principles to public youth services librarians. These methods have been previously discussed in detail in Subramaniam, Scaff, Kawas, Hoffman, & Davis, 2018.

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### Participants and Data Collection.

In 2015 and 2016, we conducted in-depth phone and in-person interviews with 46 youth-serving public library staff to discuss their use of technology in teen services. Our sample consists of 24 library staff who self-identified as working in rural libraries, and 22 library staff working in urban areas. Geographically, the participants came from 33 states and the District of Columbia. Our decision to include rural and urban libraries, and not suburban libraries, is deliberate. It is a recognized challenge to establish precise boundaries delineating suburban areas (Fahrenthold, 2013; Swan et al., 2013). Suburban environments can look more like urban or rural areas depending on how these boundaries are drawn. Thus, to maintain analytic clarity, we have opted to focus our analysis on comparing and contrasting rural and urban library contexts. This strategy also allows us to provide sufficient depth of analysis for each context within the publication format.

The protocol used in the interviews included many questions, including several that asked about library staff's youth populations, use of technology in youth programming, and partnerships, in addition to questions designed to gauge to what extent their programs integrated connected learning. We introduced connected learning only at the very end of the interview, to determine librarians' familiarity with the concept.

### Analysis

Our research team used a joint iterative process (Smagorinsky, 2008) to create a coding scheme using thematic analysis (Boyatzis, 1998). The codes were designed to align with the connected learning framework (Ito & Martin, 2013) and address our overall research goal, which is to understand those factors affecting youth-serving librarians' ability to enact connected learning in rural and urban library systems. The collaborative, iterative discussions that involved all researchers helped us ensure that the interpretation and use of codes was consistent among coders. We calculated Cohen's Kappa statistics for each code, eventually achieving an average Kappa statistic of 0.98, with an extremely satisfactory range of 0.76–1.00 (Landis & Koch, 1977). Coding was completed using Dedoose, a software platform designed for qualitative analysis.

### Findings

In our analysis, we used participants' descriptions of their youth programs and associated technology use to look for evidence that they were—or were not—enacting connected learning principles in their library settings. The following four themes emerged in our analysis as the most influential factors shaping the ability of rural and urban youth librarians to offer connected learning programs for youth: (a) community partnerships; (b) the roles that librarians tend to take (or think that they should take) in planning and implementing technology-based programming for youth; (c) youth involvement (or lack thereof) in program design and evaluation; and (d) existing external supports to offer technology-infused programs. These factors repeatedly emerged in our analysis (in 18 or more librarians interviewed per library type). However, we acknowledge that there were a very small number of librarians representing each library type for whom these factors were not central. The themes and quotes we present below are representative of the vast majority of rural and urban library participants.

#### A Range of Community Partnerships

The urban librarians we interviewed described a diverse portfolio of partners that offer technology equipment, technology expertise, space, mentorship for youth programming, and also advocate for youth participation. Partners can vary from youth organizations, local industries, community colleges, higher educational institutions, technology companies, local foundations, public and private schools, museums, science centers, and law enforcement to local artists, tattoo artists, graffiti artists, and other individuals who have jobs where youth have expressed an interest.

Rural librarians, by contrast, tended to have a rather limited pool of partners in their community, with many being able to name only one partner that they have worked with. Most often, when discussing partnerships, rural youth-serving librarians referred to their local public school as their partner. Brian, a youth-services librarian at a Western library, explained the nature of his library's partnership with the local school:

We really appreciate those partnerships, because it allows us to go into the schools, but it also allows us to reach those students that are underserved. Most likely, if they are at an after-school program, their parents might not have as much opportunity to get to the library. ... So being able to take those technologies ... and expose those kids to them ...

The partnerships that rural librarians establish are focused on bolstering two purposes for their youth programming. First, they seek partners to supply the space and/or technology needed for a desired program. Second, rural library partners provide support in the form of troubleshooting and maintaining technological equipment in the library, as well as advice on what equipment to buy. Leilani, a children's librarian at a Western library, shared about "the guy" they have who is "a retired electrical engineer and ... [has] been advising us on what to buy and whatnot."

Urban librarians are able to leverage partnerships that transform their youth-program offerings, in addition to providing technology support, equipment, and space, as described by the rural librarians. By offering programs in conjunction with community partners (e.g., a combined effort between the Boys and Girls Club and the library), urban libraries can have a greater impact on youth than if they offered a program by themselves. They can also tap community partners for their expertise in technology and associated literacies (e.g., digital photography, woodworking, music, wearable art) and for their ability to serve as mentors in technology projects (e.g., in workshops such as "How to Be a YouTube Star" and "Girls Who Code").

#### Expert or Facilitator? Librarians' Shifting Roles

Almost universally across our sample, rural librarians positioned themselves as experts in the youth program they offered, or they said they feel as if they have to be experts of technology in order to be able to offer technology-based programs. The practice of librarians' being the expert and/or provider of information is a model that librarians have been accustomed to through the story-time programs that every library in the nation has been offering for decades. Brian described this longtime practice:

You start with a story time, and it's a librarian doing a program for an audience. There's obviously that back and forth. ...The kids are involved when they come, but it's still very much a presenter and audience. ... It seems that many libraries still have kind of that take on programming.

As a result of this practice, rural librarians do one of the following: (a) They offer technology programs they believe that they (or another library staff) have expertise in and "teach" teens how to use that technology; or (b) they provide the technology without any knowledge of how to facilitate its use. This second point is illustrated by a description of the 3D printers that Tim, an assistant librarian in the West, brought into his library. "So I've been trying to bring technology in, but at this point, I haven't come up with a good plan on how to actually employ it with the kids." Only a few rural librarians said they offer technology programs that feature a community partner or youth taking the leadership role in facilitating the program.

We found evidence of urban librarians who are more open to inviting teens and community partners to facilitate technology-based programs, while they take on a more supporting role. The following example demonstrates how Holly, an urban librarian from a Western library, framed her role as an expert, learner, and facilitator in a STEM program that she offers at her library:

I had a Science Explorers Club that met twice a month at one of my libraries. ... I actually used my older teen

volunteers as mentors, like peer mentors, to come and help out the tweens and the parents with any kinds of experimentation that we would do. ... I always did a training session with them before each Science Explorers program. So they understood the concepts really well and knew what their jobs were, and then we created stations in which they were manning. And so they had some sort of mastery over this concept. And then I was there to sort of facilitate and answer the harder questions, and to make sure that everyone was included in doing something.

### The Nature of Youth Involvement

Very rarely, rural librarians described including youth voice in the design of their programs. More typically, they based their program design on the resources, access, and expertise available within their library. Carmen, a youth-services librarian at a Northeastern library, shared her thoughts on rural librarians' ability to design interest-driven programs:

You always have to start with an idea. In a perfect world, you'd be able to follow exactly what the kids are interested in. It's not always possible, but I think the librarians do their best. They do what they can. It also depends on time, and the weather, and transportation is a big issue in...

In addition to transportation and proximity issues, many rural librarians struggle with getting youth to come to the library to participate in any program. Lily, a teen-services librarian at a Western library, observed:

And then as soon as they get a little more autonomous, suddenly, [coming to the library is] not something they really wanna be doing. They're busy, they ... It's just not the thing anymore, and if we can keep them interested, if we can keep them ... If we can keep our activities up to what they need, and what they want to a point, then, hopefully they'll keep up the community involvement.

This quote suggests that part of the challenge rural librarians face in getting youth to come to the library involves the difficulty they have with gauging youth's interests.

Our urban librarian participants described a variety of ways they engage youth to share their interests. These strategies include inviting youth to serve on teen councils or advisory boards that brainstorm, plan, and sometimes even evaluate youth programs at the library; asking youth about the technologies they want to learn or experiment with; and allowing youth to work with community partners and conceptualize programs that will benefit the broader population of youth in their community. Diane, a librarian at a Southern library, reported:

So the Teen Advisory Board ... that's a huge way to find out what the teens want is to put open invitations out for the teens to come in, and come to these meetings and to communicate with me what their needs are. We've also done anonymous surveys with a teen idea box.

Despite these efforts to obtain youth input in urban libraries, we found little evidence of librarians' using more engaging techniques such as participatory design and design-thinking processes to capture youth voice and interests.

### Sources of External Support

External support (such as training, funds, and equipment) to offer technology-based programs in rural libraries comes almost exclusively from state library agencies. State library grants are awarded to

libraries to purchase technology (such as Oculus Rift, iPads, and 3D printers); provide continuing education courses and workshops through state library conferences and webinars; start technology programs (such as robotics clubs and makerspaces); and provide technical support for technology equipment in the library. As discussed earlier, rural librarians occasionally mentioned receiving external support from community partners, such as providing space or technology expertise.

The urban librarians in our sample rarely mentioned state support. This trend does not mean that urban libraries do not receive support from their state library agency, just that other external supports are paramount in urban libraries. Some libraries, for instance, have development offices/fund-raisers within their library systems that they can leverage to seek funding sources on their behalf. As described earlier, community partners provide diverse forms of support. Local industries influence the type of technology programs that urban libraries can offer, as stated by Kayla, a youth-services librarian working in an urban library in the Midwest: “After Google Fiber announced that they would be here, Mozilla opened an office locally and we received funding from their gigabit fund, and that was an interesting project that we continue to develop.” Urban libraries also partner with and leverage the resources of those local nonprofits and higher education institutions that share similar community and learning goals.

Compared to rural librarians, the urban librarians we interviewed were more likely to describe tapping into various professional networks outside of their immediate community. For example, Hannah, a youth-services librarian at a Midwest library, referred to her connection to the YOUmedia community of practice, which she said is “... really, really, really helpful. ... They keep finding little sources of funding, bringing us all together again, but even the sharing resources or people will call us.”

## Discussion and Practical Implications

The findings from the current study contribute new insight into the role that geographic context plays in the design and implementation of youth programs in public libraries. In so doing, they add complexity to the general consensus that public libraries are well positioned to support connected learning (Hoffman et al., 2016). In our review of connected learning literature, we have found that most attention has been given to urban libraries’ efforts and ability to support youth’s connected learning experiences (Hoffman et al., 2016). We do not dispute the need for this attention. Many urban libraries serve youth who otherwise lack access to rich, technology-enabled learning experiences (Reich & Ito, 2017). However, our analysis shows that rural libraries face distinct challenges of their own that must be addressed if they are to succeed at introducing connected learning into their environments.

Our analysis revealed four factors that both shape youth programming and distinguish rural and urban libraries from each other: (a) community partnerships; (b) librarians’ role as expert versus facilitator; (c) youth involvement in youth programming; and (d) sources of external support. The differences that emerged between rural and urban participants within each theme point to distinct challenges facing rural librarians’ ability to enact connected learning in their youth programs. For instance, the more restricted sources of community partners and external support in rural libraries, which aligns with previous research (e.g., Flatley & Wyman, 2009; Real & Rose, 2017), makes it challenging for these libraries to offer youth programs that align with youth’s diverse interests and academic/career goals. In addition, the more traditional roles that librarians (i.e., expert) and youth (i.e., learner) tend to assume in rural libraries further limit opportunities to implement programs that are interest-driven and peer-supported. Urban librarians were generally more comfortable placing youth and community partners at the helm of their programs and assuming a facilitator role, better positioning them to offer programs that

are driven by youth's interests, engage youth in hands-on, production-centered activities, and in which youth and adults come together around a shared purpose.

We have used the insights from this research to inform the design of a professional-development "toolkit" to support public youth librarians in their efforts to infuse connected learning principles into their youth programming. Designed collaboratively with public library partners representing a range of library contexts, the toolkit can be tailored to librarians' unique contexts, providing them with strategies to enact connected learning with the resources at their disposal.

The toolkit contains nine modules, each addressing a key dimension of designing and implementing connected learning programs, such as Mentoring, Capacity Building, Community Partnerships, and Assessment and Outcomes. In addition to containing in-depth information about each topic, the modules include library-based case studies, illustrative videos, and hands-on exercises that help librarians to apply what they are learning to their specific contexts. For example, each module employs a K-W-L chart for librarians to record (a) what they already know about the connected learning topic (the *K* in K-W-L), (b) what they want (*W*) to learn, and (c) what they have learned (*L*) once they have completed the module. This activity encourages librarians to reflect on and articulate their specific goals, thereby helping them to tailor the modules to their distinct contexts.

We believe the toolkit can be used to address the specific challenges facing rural librarians identified in this study. For instance, the Community Partnerships module helps librarians to identify, develop, and maintain community partnerships by presenting best practices and case studies of successful library-community partnerships, as well as concrete strategies for establishing partnerships. The Capacity module supports librarians' efforts to build external support for youth programming by helping them to map out their existing capacity in various areas, such as space, staffing, technological infrastructure, and partnerships. It then helps librarians to develop a personalized road map that addresses the specific capacity challenges they face, including how to optimize services with their existing capacity. The Youth Development module and Design Thinking module will help rural librarians to expand their view of the librarians' role in youth programming and encourage them to place greater emphasis on youth voice. After working through the Youth Development module, librarians will have a better understanding of the major developmental milestones during adolescence, including the various ways that teens use digital media technologies. This understanding will position them to recognize and respond to youth's interests and motivations. The Design Thinking module introduces librarians to design-thinking methods and how to employ them to develop youth programming with and for youth.

#### Limitations and Future Work

Although our sample represents a broad range of rural and urban libraries across the United States, we acknowledge that suburban libraries are absent from our analysis. We have justified this decision as an effort to maintain analytic clarity and the ability to provide sufficient depth of analysis within the constraints of the publication format (see Method section). However, we anticipate broadening our focus in future work to include librarians who describe their library contexts as suburban. Because of the variety of suburban neighborhoods, it would be informative to investigate under what circumstances their dynamics align with rural libraries, and when they are more similar to urban libraries. Such insight would provide a more complete picture of the conditions under which public youth librarians are best able to enact connected learning.



## Conclusion

This study investigated variations in youth programming and technology use among rural and urban youth librarians. We found variations in their range of community partnerships; the roles that librarians and youth assume in designing, leading, and evaluating youth programs; and sources of external support. We discussed how these differences pose challenges for rural librarians' ability to enact connected learning in their youth programming. We described how a professional-development toolkit could be used to address the challenges faced by public youth librarians working in rural areas.

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