

RESEARCH ARTICLE

Design Partnerships for Participatory Librarianship: A Conceptual Model for Understanding Librarians Co Designing With Digital Youth

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Abstract

Libraries play a central role for youth and digital learning. As libraries transition to learning spaces, youth librarians can engage in aspects of democratic design that empowers youth. Participatory design (PD) is a user-centered design method that can support librarians in the democratic development of digital learning spaces. However, while PD has been used in libraries, we have little knowledge of how youth librarians can act as codesign partners. We need a conceptual model to understand the role of youth librarians in codesign, and how their experiences are integrated into youth design partnerships. To generate this model, we examine a case study of the evolutionary process of a single librarian and the development of a library system's learning activities through PD. Using the idea of equal design partnerships, we analyzed video recordings and stakeholder interviews on how children (ages 7–11) worked together with a librarian to develop new digital learning activities. Our discussion focuses on the development of a participatory librarian design conceptual model that situates librarians as design partners with youth. The article concludes with recommendations for integrating PD methods into libraries to create digital learning spaces and suggestions for moving forward with this design perspective.

1 | INTRODUCTION

In the library and information sciences community, there is a direct commitment to understanding youth and their engagements with libraries and information access (Chelton & Thomas, 1999; Koh, 2013; Lin, Yueh, Wu, & Fu, 2014). Specifically, in public libraries there is an increasing demand for youth librarians to augment interpersonal skills with design skills (Adkins & Esser, 2004; Clarke, 2018; Hamada & Stavridi, 2014), particularly when it comes to creating, evaluating, and instituting libraries as digital

learning spaces (Ito et al., 2013; Lee & Phillips, 2018; Subramaniam, Ahn, Fleischmann, & Druin, 2012). Libraries are now playing a central role in connected learning spaces for youth (Ito et al., 2013) as they are uniquely situated to address issues of equity. Libraries provide opportunities for creating digital media (Ito & Martin, 2013; Lee & Phillips, 2018), engaging in makerspaces (Lee & Phillips, 2018), and supporting social communities around digital learning (Davis & Fullerton, 2016). As libraries are transitioning to learning spaces, youth librarians can engage in aspects of democratic design that empowers youth.

Participatory design (PD) is a user-centered design method (Sanders, 2003) that can support librarians in the

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| <p>User-centered Design: Design is based upon an explicit understanding of users, tasks, environments, and experiences (Sanders, 2003).</p> |
| <p>Participatory Design (PD): PD is a set of theories, practices, and studies related to end-users as full participants in activities leading to the design of products and processes (Muller, 2008).</p> |
| <p>Collaborative Design (co-design): This is the subset of PD where expert designers work with the target audience to solve a design problem (Walsh et al., 2013).</p> |
| <p>Cooperative Inquiry: A PD philosophy in which adults and children work together as equal and equitable design partners (Druin, 2002; Yip et al., 2017)</p> |

FIGURE 1 The relationship between different forms and methods of participatory design

democratic development of digital learning spaces (Figure 1). PD often involves close-knit activities with an end user (Muller, 2008). Collaborative design (codesign) is the subset of PD in which expert designers work closely with target stakeholder audiences to solve design problems (Walsh, Foss, Yip, & Druin, 2013). While PD is broader to include any activity with end users (for example, user-testing, informing opinions), codesign implies that the end user is a collaborator in the design process (Walsh et al., 2013). In the late 1990s, child-computer interaction researchers adapted PD more widely to include children in the design processes as equal design partners (Druin, 2002).

While PD has been integrated into digital and physical libraries to enable democratic design (Bech-Petersen, Maerkedahl, & Krogbaek, 2016; Druin et al., 2001; Large, Beheshti, Nettet, & Bowler, 2004; Somerville & Collins, 2008), we have little knowledge of how youth librarians can act as codesign partners. Unlike designers and researchers, youth librarians have responsibilities for their local community, such as information retrieval, youth services, and community outreach (Hamada & Stavridi, 2014). Therefore, it is important to understand how librarians, who may not be professional designers, can engage as design partners. We need a conceptual model that examines the role of youth librarians in codesign, and how their experiences are integrated into design partnerships.

To generate this model, we examine a case study of the evolutionary process of a single librarian (Javier, pseudonym) and the development of a library system's learning activities. In this study, we used a codesign methodology called Cooperative Inquiry (Figure 1) to work closely with children, librarians, and researchers as equal design partners. Cooperative Inquiry examines how children and adults can work together as equal and equitable design partners (Druin, 2002; Yip et al., 2017). Figure 1 summarizes the relationships of these design concepts.

Our research questions are:

RQ1. What roles can a librarian play in codesign partnerships with youth?

RQ2. How do the experiences of a librarian inform our understanding about codesign partnerships with youth?

To answer these questions, this study examines a total of 12 codesign sessions with KidsTeam UW, an intergenerational codesign team of adults and children that meets twice a week during the school year. We highlight Javier's work as a librarian seeking more opportunities for digital instructional design and his design partnership with the KidsTeam UW children. Using a model of design partnerships (Yip et al., 2017), we analyzed video recordings and stakeholder interviews on how KidsTeam UW researchers and children (ages 7–11) worked together with adults at a library to develop new digital learning activities for children and family patrons. Our discussion focuses on the development of a conceptual model that situates and contextualizes youth librarians as design partners with youth. The article concludes with recommendations for integrating PD methods into libraries to create digital learning spaces and suggestions for how to move forward with this perspective.

2 | BACKGROUND

2.1 | Participatory Design and Participatory Librarianship

Libraries have utilized PD methods to codesign functional use of community libraries. Codesign work with libraries include designing learning commons together with students, faculty, campus stakeholders, and librarians (Somerville & Collins, 2008), co-creating organizational structures and communication systems with librarians (Somerville & Howard, 2010), and the development of a public library (Bech-Petersen et al., 2016; Dalsgaard & Eriksson, 2013). Although PD has occurred in libraries, the focus has been on technical aspects of design rather than understanding librarian engagement.

Librarians have also used PD methods for learning and technology. For instance, Somerville and Nino (2007)

used codesign activities to advance library strategic assessment efforts of learning 2.0 technologies (for example, blogs, wikis, photos) by library staff members and researchers. Santos, Ali, and Hill (2016) explored the design and implementation of a virtual learning commons to support learning activities in university students in libraries. Tevaniemi, Poutanen, and Lähdemäki (2015) utilized codesign methods with an academic library to create temporary multifunctional learning spaces in Finland. In these cases, the emphasis is on undergraduates, not K–12 youth in public libraries.

The role of youth–librarian collaborations are often relegated to advisory boards, in which youth provide advice to librarians on design. Camino (2005) warns that youth–adult collaborations can have pitfalls, such as adults depending too much on youth to run programs, adults refusing to yield power, and adults relying on youth stereotypes. Camino determines that a key ingredient for successful youth–adult partnerships is the need to develop (a) learning communities (Senge, 1991), (b) communities of inquiry (Friedman, 2000), and (c) communities that engage in reflection in practice (Schön, 1987). These three elements from Camino (2005) are at the core of a *participatory librarianship* with youth.

Braun (2008) describes the concept of participatory librarianship as the reframing of library practice; librarians are facilitators of conversations through practice, policies, programs, and tools. A participatory librarian seeks to listen, support, communicate, and serve together with their community. We argue that participatory librarianship complements PD in its goals. However, there is a need to critically examine how librarians engage in PD practices in their library contexts.

2.2 | Libraries as Community Learning Spaces for Digital Technologies

Turner, Welch, and Reynolds (2013) note that libraries are evolving from delivering information towards more collaborative multifunctional learning environments. The idea that libraries today are shifting towards learning spaces has begun as part of the digital revolution (Lee & Phillips, 2018; Turner et al., 2013). A grassroots maker movement has been on the rise in the USA (Ito & Martin, 2013; Lee & Phillips, 2018), and libraries have been on the forefront of this trend. Ito and Martin (2013) note that digital learning experiences in libraries are shifting libraries towards Connected Learning; that includes developing peer-support, creating interest-driven learning opportunities, supporting academic engagement, emphasizing digital tools towards production-centered ways, giving youth a shared purpose, and providing open networks and resources.

Physical spaces are also designed for learning in libraries through PD. Dalsgaard and Eriksson (2013) present a PD project on the large-scale codesign of the new Urban Mediaspace Aarhus. One such project focused on the Interactive Children's Library; community members codesigned a series of new information technology services and physical installations for libraries that supported children's play and learning. PD methods have also been used in the creation of learning programs in school libraries. Ahn et al. (2012) examined PD work in school libraries in creating an afterschool program to help middle school students develop identities as scientists through storytelling. Overall, as libraries shift from information commons towards multifunctional learning spaces, there is a need to understand the PD process for youth librarians and digital learning purposes over a period of time.

3 | THEORETICAL PERSPECTIVE

Our study focuses on Yip et al.'s (2017) design partners conceptual model to examine the roles of librarians in PD (Figure 2). The model unpacks what constitutes an equal and equitable design partnership into four dimensions that span from unbalanced to balanced interactions: relationships, facilitation, design-by-doing, and idea elaboration. For further discussion on equity and equality in design partnerships, see Yip et al. (2017).

Relationship building emphasizes how much social interaction occurs in a codesign group. Unbalanced relationships occur when adults are isolated from children, while balanced relationships demonstrate closer adult–child socialness in design. *Facilitation* highlights how much support is necessary to run a codesign session. The facilitation dimension spans from unbalanced assistance when adults primarily lead the session, while balanced partnership occurs when children and adults work together to manage codesign. *Design-by-doing* refers to when design activities take place, such as evaluation, building mockups, and developing scenarios. An unbalanced design-by-doing interaction occurs when adults just observe children's engagement, while the balanced version arises when adults and children engage together. *Idea elaboration* takes place as adults and children generate ideas together. Unbalanced idea generation exists when only children (or adults) create the ideas; balanced partnership exists when participants work together to mix ideas.

While Yip et al.'s (2017) conceptual model provides a foundation for what equitable and equal design partnerships resemble, the model does not highlight specific nuances for roles when it comes to intergenerational design partnerships between adult librarians and children.

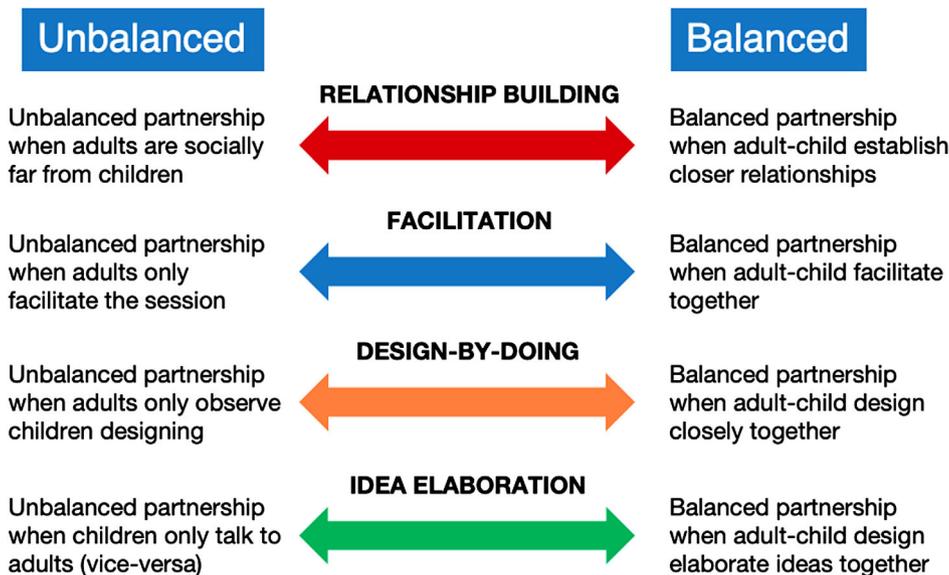


FIGURE 2 Four dimensions of equal and equitable design partnerships (adapted from Yip et al., 2017)

4 | METHODS

4.1 | $N = 1$ Case Studies

We employed a case study method (Merriam, 2009) to examine design partnerships of digital learning activities for youth patrons of a library. We investigate a single-case study of Javier (pseudonym), a digital learning specialist at The Seattle Public Library and his 12 codesign engagements with KidsTeam UW across 2 years.

Javier's single-case is a *revelatory case*, in what Yin (2017) describes as a unique opportunity to observe and analyze an understudied phenomenon. The larger unknown phenomenon we are examining are the roles a librarian adopts through PD engagements over time with children. Therefore, for the $N = 1$ case to have power, the selection of the individual needs to be strategic (Flyvbjerg, 2006).

We selectively chose to study Javier's case for two compelling reasons. First, he came to KidsTeam UW to safely experiment his digital learning designs before a larger setting implementation. His single informant perspective can be the basis for understanding the shared points of view of a community (Harper, 1992). He represents librarians looking for opportunities to design closely with youth.

Second, Javier represents a *longitudinal case* that examines a single-case across time to demonstrate how situations and processes change (Yin, 2017). Javier's 2 years in 12 sessions allows us (i) an in-depth examination of what engagements happen in PD sessions that are important for a librarian, and (ii) understanding of how multiple PD sessions influence the final designs for a librarian (Merriam, 2009). Although Javier is an

individual, his longitudinal interactions provide new understandings of how youth librarians utilize PD that go beyond his specific experience. This case overall reveals the entanglement between design and librarianship responsibilities and how that intricacy can affect a youth librarian's reaction towards PD.

4.2 | Contexts and Participants

We examined an intergenerational codesign group of researchers, librarians, and children (ages 7–11) called KidsTeam UW for a period of 2 years (2015–2017). We chose ages 7–11 because this age group is developmentally mature enough to codesign, but young enough to think like a child. We recruited children through professional connections and word-of-mouth; we also strove for diversity in ethnicity, socioeconomic status, gender, and age to gain multiple perspectives (Table 1). Overall, 13 different children participated in KidsTeam UW.

Adults in the core group consisted of undergraduates, graduate students, postdoctoral researchers, and one professor. Javier and another library volunteer also participated. All adults (including researchers) worked with children as “design partners” in close collaboration (Druin, 2002). First and second authors participated with Javier, while recording and observing the sessions as participant observers (Jorgensen, 1989).

Each of the 12 codesign sessions began with *snack time* (~15 minutes) to help the adults and children develop closer relationships. In *circle time* (~15 minutes), participants engaged in an introductory activity called “Question of the Day” to help prime everyone to think about the session's goals. Next, the facilitators presented

TABLE 1 Demographics of the child codesigners (pseudonyms)

| Child name | Age started | Gender | Ethnicity | Years in KidsTeam UW |
|----------------------|-------------|--------|-----------------------|----------------------|
| Gina ^C | 11 | Girl | Asian | 1 |
| Adi ^C | 11 | Girl | White | 1 |
| Zaagin ^C | 9 | Girl | Native American | 1 |
| Kai ^C | 11 | Boy | Native American | 1 |
| Bob ^C | 9 | Boy | White | 1 |
| Mia ^C | 7 | Girl | White | 1 |
| Austin ^C | 10 | Boy | Asian | 1, 2 |
| William ^C | 7 | Boy | White | 1, 2 |
| Zen ^C | 7 | Girl | Asian/Black | 1, 2 |
| Riku ^C | 9 | Girl | Asian/White | 1, 2 |
| Carmen ^C | 8 | Girl | Asian/White | 2 |
| Veritas ^C | 8 | Boy | Asian/Native American | 2 |
| Toby ^C | 7 | Boy | Hispanic | 2 |

the design objectives. During *design time* (~45 minutes), participants interacted together using PD techniques (Walsh et al., 2013) to create artifacts, evaluate technologies, and design learning activities. Finally, in *discussion time* (~15 minutes) participants gathered together to present their designs and make final suggestions for the designs.

TABLE 2 Descriptions of the 12 codesign sessions

| Design sessions | Activity |
|--------------------|--|
| Year 1 (2015–2016) | |
| 1–3 | Examined codesigning learning activities for <i>Finch Robotics</i> (http://www.Finchrobot.com/), a small programmable robot using snap block programming. |
| 4–5 | Emphasized codesigning learning activities for <i>littleBits</i> (http://littlebits.cc/), a set of circuits that can interlock together. |
| 6 | Investigated how <i>TaleBlazer</i> (http://taleblazer.org/), an augmented reality game making tool, could be used in the library. |
| Year 2 (2016–2017) | |
| 7–8 | Focused on designing learning activities for <i>Sphero BB-8</i> robots (http://www.sphero.com/starwars/bb8). |
| 9–10 | Investigated how children could design new activities for <i>Lilypad</i> e-textiles (https://learn.sparkfun.com/tutorials/e-textile-basics). |
| 11–12 | Examined the potential of <i>Hummingbird Robotics</i> (http://www.hummingbirdkit.com/). |

KidsTeam UW meets twice a week after school for 90 minutes on a university campus. In Year 2, KidsTeam UW implemented a week-long summer session (Table 2). We recorded all 12 sessions and collected over 1,000 minutes of codesign sessions.

4.3 | Data Collection

4.3.1 | Analytic memos

A single video camera recorded all 12 sessions and focused on the child–adult interactions. The researchers also photographed the activities and artifacts of the sessions. Afterwards, researchers wrote analytical memos for each session. The first author watched all sessions and took notes on conversations and ideas around design and generated artifacts. Next, the second author watched the videos and added to the first author's notes. Both authors chose to transcribe portions of the video, such as design dialogs, frustrations, and positive affect in the design interactions.

4.3.2 | Interviews

To better understand the needs of the library system, the lead author conducted three interviews with the librarian (Javier). The first interview (I-1) occurred after Year 1 (June 2016, 66 minutes) to reflect on the first year of codesign. We structured two interviews (I-2, March 2017, 74 minutes; I-3, October 2017, 87 minutes) using Van Es and Sherin's (2008) method of noticing pedagogical practices. The authors

selected two to four short video clips per design project for years one (Finch Robots, littleBits, TaleBlazer) and two (Sphero BB-8, LilyPad e-textiles, Hummingbird Robotics). The criteria for choosing the clips were that they show (a) an interaction with Javier and the children, (b) either tensions or productive interactions in codesign, and (c) a summary wrapup of the codesign sessions. The first author showed the clips to Javier, and asked Javier, “what do you notice?” and “what did you learn from these sessions?” We collected 227 minutes of audio interview recordings.

4.4 | Data Criteria and Analysis

4.4.1 | Primary deductive process

We began the analysis with a deductive process in trying to understand how Javier’s interaction could be deduced from four aspects of equal and equitable design partnerships (Yip et al., 2017): relationship building, facilitation of codesign sessions, design-by-doing, and idea elaboration. We began data analysis by coding the analytic memos generated from the video recordings of the codesign sessions and the interviews. Our goal was to focus on the design interactions between the children and the librarian.

First, we developed a set of criteria to select in-depth interactions between the librarian (Javier) and the KidsTeam UW team. We chose to focus on codesign projects with two or more design sessions and considered the similarities of the projects. In analyzing the projects, we examined the conflicts that occurred in the sessions, such as disagreements and arguments about the technologies and the designs. We undertook deeper analysis of the following three projects.

4.4.2 | Finch Robots

Children started in the first session with an evaluation of their likes, dislikes, and design ideas. In the second session, Javier wanted the children to spend more time creating obstacle courses for the Finch robot to see how this activity could function in a library setting. In the third session, Javier asked the team to help build a tutorial prototype to support patrons’ usage of the robots.

4.4.3 | littleBits snap circuits

In the first session we completed an evaluation of the littleBits to compile the children’s likes, dislikes, and design ideas (Walsh et al., 2013). In the second codesign session, Javier wanted to know what it would be like for

the children to reverse engineer a car he built using littleBits.

4.4.4 | Sphero BB-8 robots

For this first session, children started evaluating their likes, dislikes, and design ideas for the robots. In the second session, we gave the children the goal of codesigning both competitive and collaborative activities for the robots.

For each design session memo and interview we used Yip et al.’s (2017) coding scheme of balanced and unbalanced relationships, facilitation, design-by-doing, and idea generation. For relationships, we looked for aspects of friendship, playful behavior, and also times where the librarian needed distance from the children. Under facilitation, we examined the data looking at how the librarian managed children’s behavior and time and how librarians and children organized the design session. We looked for design critiques and instances of participating together in design-by-doing. Finally, we coded idea elaboration as what ideas were suggested and did the librarian and children mix or not mix ideas. When applicable, we noted balanced and unbalanced forms of the design partnership. We used the codes as qualitative bookmarks, rather than as quantitative counts (Hammer & Berland, 2014).

4.4.5 | Secondary inductive process

As we validated the initial findings, (see Methodological Rigor, below) we noted the data did not quite match with Yip et al.’s (2017) model, resulting in a secondary inductive process to explore the possibility of a new model. We used affinity diagramming, an inductive approach of organizing qualitative data into larger themes (Harboe & Huang, 2015). A central theme that emerged was that of librarian roles. We iteratively organized the coded data into broader categories of “librarian as supporter of youth” and “librarian as designer with youth” and the subthemes of relationships, facilitation, design-by-doing, and idea elaboration. Overall, the process of cycling from deductive to inductive processes allowed for prior theory and concepts, along with new observations, to flow together (Kuczynski & Daly, 2003).

4.5 | Methodological Rigor

We took on three validation processes to maintain methodological rigor of this single case (Harper, 1992; Merriam, 1995; Yin, 2017).

4.5.1 | Triangulation

We validated our findings by triangulating the analytic memos, interviews, and photographs to make sure all evidence supported each other (Creswell & Miller, 2000). We conducted a selective coding process; we developed diagrams and formalized the relationships between the librarian and the design partnership with the children.

4.5.2 | Interpretive rigor

Creswell and Miller (2000) note the importance of external reviewers to audit qualitative studies. To establish validity, we presented our analysis to an external reviewer (third author) who did not initially plan and conduct the study, but acted only as an independent check on the interpretations of the data by following initial arguments, questioning findings, and determining if findings had grounding (Creswell & Miller, 2000). From the audit, we changed our initial findings from trying to fit the data to Yip et al. (2017) (deductive) towards creating a new conceptual model (inductive).

4.5.3 | Rival explanations

Finally, we presented the librarian (Javier) with our analysis as a member check (Creswell & Miller, 2000) to make sure this analysis was consistent with his thinking and to develop rival explanations to validate our single case (Yin, 2017). We presented the themes with the interview data and quotes. We asked Javier to comment if the initial themes matched his experience and identify changes that needed to be made. As we tried to use the Yip et al. (2017) conceptual model to explain the data, he pushed back and articulated to us that librarians constantly shift their roles in the libraries, especially during codesign sessions. We integrated his thoughts into the final analysis and a new model that emerged from the data.

5 | FINDINGS

5.1 | Conceptual Model Development

Based on the in-depth analysis of the three projects (Finch Robots, littleBits, and Sphero BB-8) and the interviews, we developed a new conceptual model for participatory librarianship design partnerships (Figure 3). We highlight interview transcripts (I-1, I-2, I-3) and analytic memos (Sessions 1–12) that contribute to this model. We

generated two main themes based on our coding, using the Yip et al. (2017) conceptual model: Librarian as *Supporter of Youth* and Librarian as *Designer With Youth*. Each of Yip et al.'s (2017) dimensions of relationship, facilitation, design-by-doing, and idea elaboration are represented as spectrums of engagement. This newer model emerged from the data as Javier spoke more about the different roles librarians play in their communities and design. We emphasize that this is a fluid model that considers a range and mix of roles that a librarian has to consider in design. As children and adults develop relationships, the power dynamics can shift between leading and following. In our model, librarians in codesign are not striving for one endpoint or the other in the model, but having the contextual flexibility to move between the spectrums.

5.1.1 | Relationship building

The key to design partnerships is the building of trust in adults and children (Yip et al., 2017). Librarians need to manage and negotiate tensions in relationship building between time spent engaging a library community and time used for designing together with children.

Librarians as community facilitators.

Librarians need to spend time in their positions getting to know their community as a whole. Thus, Javier noted, “Yeah, they [children] come [to the library] because they form some connection to the people, to the [library] space, and also to the adults. These kids feel comfortable coming in; so, do librarians” (I-3). Javier noted that librarians have to spend much time with the community:

Staffing will be a big issue because librarians are asked to do a lot. They have to be at the reference desk, they have all the communicating engagement and they have to reach the community then will have the digital media and so we will have to. So that would be challenging — how do you allocate staff to do this [codesign] in a regular basis? And the retention of kids also recruitment. How do you do recruitment then from this program and keep them coming back? (I-1)

Librarians dedicate much of their time to communicating with their communities in a broader context. However, when it comes to digital activities, it can be tricky for the librarian to navigate community building. They are already pressed for time; their development of new digital activities for the library needs to take into account the

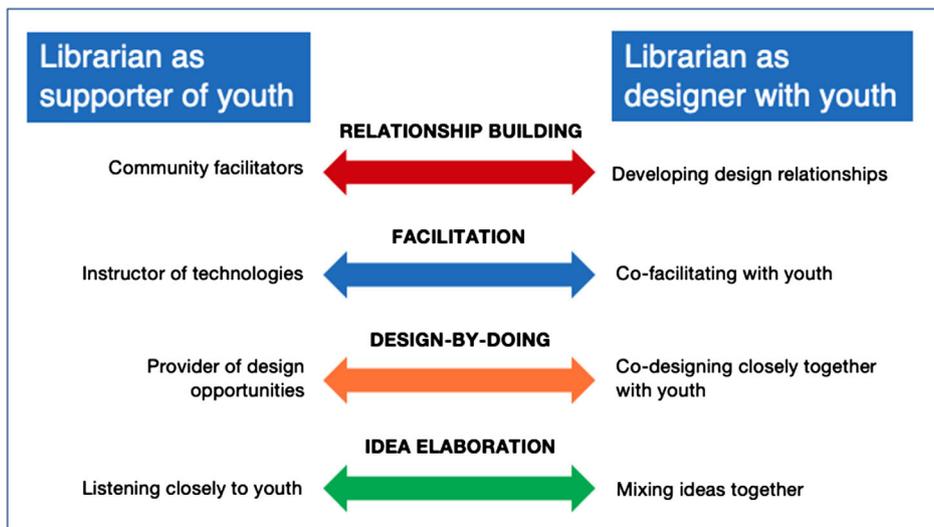


FIGURE 3 A conceptual model for participatory librarianship design partnerships

Participatory librarianship (Camino, 2005) form as a result of learning communities (Senge, 1991); communities of inquiry (Friedman, 2000); and reflection in practice (Schön, 1987)

chance to develop community-based relationships with the children.

Librarians developing design relationships.

One possibility to engage more in community relationship building is through design relationships with librarians and patrons. A design relationship is different (but not mutually exclusive) from community building. First, design relationships may challenge librarians as adult authorities. For instance, in codesign Javier noted that right from the beginning it was important for everyone to accept critique and have moments of reflection:

Because we discuss on the technology and then we are going to go do there and then we maybe write it and I come prepared to implement that plan. So, we talk about it [codesign] from the beginning and then do it with the kids and then I guess all of that is part of the relationship. Because we pass ideas. Like should we do this. And you say nah. We go like back and forth. The process of thinking about it, planning it and the reflection at the end. (I-1)

Javier observed that codesign was not just about the development of new ideas together. Instead, codesign was more about working together with children to develop the mindset, practice, and relationship as designers. As librarians work with children codesigners over time, and build their relationships, they could begin

to see the importance of design practice and relationship building for these kinds of activities.

Second, Javier noted that design relationships can help librarians break out of certain ideas concerning authority with children. He explained that in design relationships, there is shared learning between the librarian and child:

I think traditionally the librarian is in front and they are doing a book talk and then the children are in the back listening to it. That's sort of the model. They do story time.... Where here [KidsTeam UW] it is more shared, the learning and the authority. The authority is there [but] it's not so defined. (I-1)

For instance, Javier highlighted that during the littleBits codesign sessions (Sessions 4–5), he realized that there was a need for him to create a series of workshops, rather than just one chance to try out the digital activities. Over time, more frequent sessions better develop design relationships with children. Design competence is the knowledge, skills, abilities, and identity development that helps adults and children become involved in design. However, design fluency can take time to develop (Gray, 2014). This codesign session helped Javier think about how libraries need to both encourage children patrons to “drop in” on design activities and develop longer design relationships. Javier noted the importance of consistent interactions between librarians and children:

I'm always telling them [librarians], we need to do series of [design] workshops. Why?

Because the more they [librarians] get into this practice and you build relationships with the kids, and you have this interaction with them, they're going to acquire this kind of fluency that [KidsTeam UW child] has, right, or like kids at KidsTeam UW have that they are already thinking as designers. (I-2)

5.1.2 | Facilitation

A librarian in codesign often needs to think about how to instruct the youth to engage in the learning technologies. For librarians (and many other adults), the transition from instructor to cofacilitator can take time. For some designs, the technology was simple enough to figure out (for example, Sessions 7–8, Sphero BB-8), but other times the technology needed scaffolded instructions before the children could even begin to contribute towards idea generation (for example, Sessions 1–3, Finch Robots). Participatory librarianship design requires librarians to know how to make these transitions between instructor and cofacilitator.

Instructor of technologies.

Javier noted that even though librarians may be supporters of youth, they can still project a sense of teacher authority. For him, it was difficult to grasp codesign initially. We observed Javier needing to demonstrate and troubleshoot the technology or provide scaffolds for more difficult learning technologies (for example, Sessions 9–10, e-Textiles). In the Finch Robots (Session 2), Javier took over the keyboard for the children, so they would not make mistakes in programming the robot.

Javier asked Riku^C if she needed help and she replied yes. Javier went into how programming the Finch robot worked. In the video, he told her where to go on the screen and confirming, “yes,” “no,” and “good.” Within a minute, Javier was right behind Riku^C telling her what to click and press as he pointed at the screen over her shoulder. (Session 2 memo)

Javier noted what he thought his role was during the first design sessions:

Although, observing sometimes I think is better if you, like, try this, but don't take over the keyboard. Then I eventually gave up on that problem, right. I was like, okay, you

know what, I'm not going to figure this out. Then I went back to work with Riku [child]. I was going no, no, it's yours. (I-2)

Javier regarded designing with the children as initially difficult because of the perceived need for control during codesign. Javier expressed an unbalanced aspect of the partnership, the need to want to correct children in how to interact with the technology. For some librarians, codesign can be a new process, and it can be necessary to take on instructor roles. Javier explained:

It's [codesign] new to them. I think librarians want to control the room like I am in charge in the room and that happens with teachers. I am here, and you are going to do what I say... Librarians are also afraid of behavioral issues. If a kid runs around the room because he had a bar of chocolate, they become focused on that. (I-1)

Javier expressed that for some librarians in his group, there may be pressure to teach such activities, both digital learning and codesign:

I think that because you are introducing these new [digital learning] programs in the library, this is new for them [librarians]. They have not worked with this kind of like technology. It's a new practice for them. Design is not something they have been doing either. It's like, they come in, they do like story time, they read a story, and you know, that's it, right. (I-2).

Cofacilitating with youth.

Codesign with youth means giving up some power in the library. Javier explained that libraries cannot just purchase and implement technological tools, but instead they must develop the right learning activities with the technologies. For instance, the littleBits codesign sessions allowed Javier to see how children conceptualized the tool and the context for which it is situated.

In the littleBits session, Javier brought a fully designed car. However, none of the children took the car apart to reverse engineer it. During the discussion, Javier (sitting on the ground with the children) asked more about this. The children expressed they did not want to take the car apart because they did not feel comfortable with the components. Riku^C raised her hands in frustration with the “glue dots” that held the car together and kept falling apart. Javier replied that “they (glue dots) were convenient

right?” The children noted yes, but the glue dots were highly “irritating.” (Session 4 memo)

Upon reflection, Javier stated “So, it’s more for me the important part is when kids have creating and design and thinking about the use of that tool to what they can build around” (I-3). Cofacilitating with the youth allowed Javier to determine what materials he could use and how the activities could be designed for other patrons.

Cofacilitation means that librarians need to provide some structure and freedom at the same time. Javier observed that in codesign groups, children needed time for experimentation within a structure:

You have a very good structure [in KidsTeam UW]. But there is a lot of room for them to experiment. All the small little things that you do that create the structure, the snack, writing their names, the sitting in the circle to ask the question in the beginning and then the experimentation that happens and then the coming back. I think that having them see that and understand how a structure does not have to be so rigid. (I-1)

Javier explained that codesign partnerships can often disrupt prior assumptions of how librarians work with youth. He noted a feeling that librarians want activities scaffolded well in libraries, “People [Librarians] want to know step 1, step 2, step 3.... I think usually they want to know, okay, what am I going to do first, and what am I going to do next and next, right. So, like lead me kind of things” (I-2). With design partnerships, children may start out with scaffolded codesign activities between librarians and children, but at some point librarians may have to give up some autonomy so that the children can lead the groups themselves.

5.1.3 | Design-by-doing

Our conceptual model notes two parts of the spectrum for librarians in design-by-doing: librarians as providers of making and design opportunities for youth and librarians as codesigners with youth.

Provider of design opportunities.

Javier noted that youth librarians are often concerned with services to youth, such as providing digital learning activities, being an information broker, and doing the day-to-day job of library services. There can be concern about retention and service of patrons; will children want to come back for

the learning activities and library services? Javier expressed that there can be pressure to make sure design opportunities (for example, makerspaces) are successful:

We [librarians] have to worry about retention with the kids. You have that built already. I also have to be mindful about the perception of the librarian.... If I gave them a workshop and the workshop had flaws and it didn’t really work, then they will be less willing to do it again. Because the digital media thing in the library, it’s very new so this practice of informal learning, it needs to build trust with the librarians delivering the program. (I-1)

For Javier, the pressure for librarians to run design workshops and opportunities means feeling that the investment has to pay off. Implementing a design workshop involves a significant time investment to recruit participants, reserve a space, and set it up. Therefore, making sure the first workshop runs smoothly is important. Even during the codesign sessions with Finch Robots (Sessions 1–3), Javier felt the need to constantly jump in to make sure the children were engaged with the technology.

Librarians codesigning closely together with youth.

Design relationships reframe the role of the librarian, from services provider to partner. Rather than worrying about retention in programming activities, relationship building in codesign focuses more on building a design team that will provide honest critiques. Javier transitioned back-and-forth from a librarian that cared about how to instruct the children, towards one that built trusting relationships for design critiques. In KidsTeam UW, Javier felt it was a safe space to experiment with his designs with the children, even if the codesign session did not go as planned (I-1).

At the heart of codesign between the adults and children are the closer interactions that appear when design occurs between the two groups. For the librarian design partner, there are moments to work closely with children and then there are times to take a step back for the larger overview. The participatory librarianship designer needs to frequently make these shifts, working closely in codesign with children, but at the same time knowing the larger picture and being aware of all that goes on in the codesign space. For instance, as Javier worked closely with the children in littleBits, he commented that he became more observant of the children’s designs as he worked closely with them.

Javier was working closely with Mia^C; she took craft materials and attached a

littleBits fan to a sticky note to make the paper flap. As the fan rotated, a buzzing sound was created for their ladybug design. During group discussion, Javier mentioned how other nondigital materials contributed to inspiring the creativity in littleBits. (Session 5 memo)

Javier stated in this clip that he and the children started to develop design fluency (Gray, 2014) in their close engagements. The memo showed how it was fine not to be fully prepared with equipment and allowing the children to have the chance to codesign the use of the technology for future ideas. At the same time, Javier constantly had to switch into troubleshooting mode with the children (similar to the facilitation engagements). He spent time making sure the technology did not break down or the children did not get into trouble with the technologies.

However, Javier found the KidsTeam UW children to be quite unpredictable. Codesign instances such as this could actually help prepare librarians on how to work with children. For instance, in the littleBits (Session 4), the children figured out how to interfere with each other's designs by using a wireless remote to control another groups' design. Javier explained:

So, they (the children) broke your (littleBits) activity basically. Right, then you've got to do something else. So, adapt to their engagement with the learning activity that you created and how you have to switch it around. You know, that can be very challenging to give like another experience, right. Like an educator working with kids. (I-2)

5.1.4 | Idea generation

The model has two aspects for idea generation.

Listening closely to youth ideas.

Javier was conflicted in the early days. He would try to quietly observe KidsTeam UW children from a distance in their interactions while trying out new technologies (Sessions 1–3, Finch Robots). Javier did not want to disturb the youth or sway them in their opinions on the design activities. Javier expressed that in the digital learning context the “adult [librarian] is always like really afraid or something” (I-3). Many librarians want to observe what children are doing in these digital workshops and opportunities. However, observation alone for librarians may not allow time for deeper processing: “So

if I go [to a workshop] and I observe I will just observe it. I may forget, and it's not processed” (I-1). In this observation and listening situation, librarians often do not have time to process what they see. Javier stated, “So, you [a librarian] go, you do a workshop. You make it work as much as you can. There might be some things you observe that did not work and you put things away and you clean the room and move on” (I-1).

Some librarians working with youth may be trained in a way that focuses on program implementation, observation, and listening, rather than design partnerships that emphasize idea generation together. Javier called design thinking “a frame of mind you got to work with” but that he does not believe “this kind of thinking has been taught in library schools” (I-3). We believe there is an important role to play in listening and observing youth as part of the responsibilities of a librarian.

Mixing ideas together.

In contrast, diverse ideas around digital learning can form as children and adults speak together. However, this mixing of ideas was not always intuitive for Javier. It was only after time spent with the children that he expressed some comfort that the librarian had a voice and say in the design. If design relationships are developed well between the librarian and youth patrons, design ideas can be generated together, and active idea exchanges can occur. For participatory librarianship design, the librarian has a say in the design with youth. Librarians are the experts of their contexts, neighborhoods, and patrons.

Austin^C and Veritas^C created a game with the adults with paper and feathers in the BB-8 robots' head. Javier asked what the rules were. Austin^C and Veritas^C explained that the goal was either to knock the feather off the robots' head or push the BB-8 out of a boundary ring. Javier commented that both conditions could indicate the winner. Hearing this, the group quickly used tape to trace and make a bigger circle for the boundaries. (Session 8 memo).

Javier expressed comfort, as he added his thoughts and explained his design decisions. He noted the importance of speaking his mind during idea generations with the children, making it so that the contributions are not patronizing.

I also like the fact, like the adult contribution is huge. Like, you don't have to, you can actually help them by expressing. Then I also thought about, the other thing is that when the adult has the sort of collaboration with

the kid, the kid acquires the sort of kind of like a validation that he's like that they are as important. Because you are talking to them and contributing. So, it's not just kind of like patronizing.... (I-3)

Overall, for design partnerships to occur for librarians and child patrons, there is a need to a sense of safety for both the adult and child. Javier concluded the following about adults and children working together:

For me, some of the things that I learned the most about in KidsTeam UW is the fact that the adult has a voice, that usually I think that kid's voice or youth voice. I used to have this concept that, that the voice meant that the adult didn't have one. Like, oh kid's voice means, you're supposed to disappear in the room, right. I think that one of the things that I learned here by working with you is that the adult's voice is very valuable, right. Like you can say adults get to contribute to it, right. Because it pushes mostly forward, right. (I-2)

6 | DISCUSSION

In this article, we argue that deeper understanding of PD in libraries requires an analysis of design partnerships between librarians and children. It is important to understand the role of youth librarians as design partners in the process of codesign. Our first contribution is the development of our participatory librarian conceptual model. We believe that applying the adult-child design partner model (Yip et al., 2017) contributes to the field and theories of library and information science (LIS) because it provides a new understanding and framing of what participatory librarianship design means for youth librarians.

Prior work in conceptualizing design partnerships have only focused on a generalized adult-child interaction (Yip et al., 2017) through the idea of equal and equitable partnerships (Druin, 2002). Similarly, the literature on PD, youth, and libraries also has not taken into account the specific roles youth librarians play in both design and their responsibilities in the library (for example, Somerville & Collins, 2008). We argue that there is a need to tease apart different roles that adults play with PD, particularly when the adults play multiple roles in a single context (that is, librarian as designer and information specialist). In our case study, there are two kinds of

adults: design researchers and librarians. Both adult groups have different expertise and experiences but mixing them together as a single group of adults masks the complexities. Our case study shows that describing design partnerships for participatory librarianship as binary "designer" and "librarian" is too simplistic. The findings illustrate how the four dimensions of librarian-child interactions shift between the librarian as supporter of youth and designer with youth.

Our model for participatory librarianship demonstrates that training librarians to be design partners with youth means focusing on the shifting tensions between traditional librarianship and design. Learning to be a design partner is not about giving up librarianship experience and skills in design contexts. Rather, it is about developing new skills in design and expressing them within codesign contexts. Frequent transitions between librarianship and design do occur. In some contexts, librarians need to instruct children on the design process, but other times librarians can shift to co-constructing together. Becoming a design partner in participatory librarianship, however, is not an overnight process. As this study shows, knowing when to shift between library support experiences and codesign is key to the process. We believe that our conceptual model provides guidance to develop programs for future librarian training programs in Master of Library and Information Science (MLIS) degree and professional development for practicing youth librarians.

Second, our study contributes to the pragmatic support of librarians and instructional design. While our model provides a way to conceptualize the role of a design partner for librarians, it is also necessary to discuss how to create a realistic process in which full-time librarians engage in PD independently. Participatory librarianship design depends on both the experience of librarians and design engagements with youth. Therefore, it is not about training librarians to become full-time instructional designers that codesign with youth but working with librarians to learn how to negotiate back and forth between supporting youth patrons in their daily practices and designing with youth.

To engage in such codesign practices, librarians need support to create their own intergenerational codesign groups of adults and youth to help develop learning activities for local patrons. By helping support the creation of these codesign groups, local libraries can develop different ways to integrate PD methods to support local neighborhood needs. To ensure that there is a support system in place for librarians running local intergenerational codesign groups, we need to utilize a community of practice model (Lave & Wenger, 1991) in which university LIS schools/departments, design

researchers, and local libraries partner together. We also believe in having youth librarians work with other community stakeholders to support codesign. Such stakeholders could include MLIS programs, educators, and community groups in which program design is a priority.

We believe more research is needed from MLIS programs in how PD can be integrated into instructional practices beyond youth engagement. For instance, we designed an academically based community service course (Harkavy, Benson, Hartley, & Hodges, 2017) where our class meets for discussion, and then codesigns with youth and librarians. We are developing these university–library partnerships to support the democratic mission of the university (Harkavy et al., 2017) and engage in human-centered design in libraries (Yip & Lee, 2018).

7 | LIMITATIONS AND FUTURE WORK

Our conceptual model for librarian–youth design partnership is meant to be used as an analytic tool. We do not advocate for this model as a quantitative scale to measure if librarians are engaging in equitable and equal codesign processes. Our model is a contextual guide rather than an objective measurement for librarians and codesign. This is a case study of a single librarian working in collaboration with a university. It is to inform analytical generalizations and theory-building rather than statistical generalizations about PD in libraries (Yin, 2017). Therefore, this model is limited to understanding PD from a specific methodological perspective (Cooperative Inquiry). Other perspectives of PD do exist (DiSalvo, Yip, Bonsignore, & DiSalvo, 2017); our model only examines a certain viewpoint of codesign.

We acknowledge the source of our model originates from a North American framing within a resource-rich urban library system. Currently, we have less knowledge on how design partnerships in libraries would work in cultures in which children are more encouraged to listen to adults and follow instructions, rather than adult–child collaborations. Differences exist between broader cultures (macrosystems); policies and infrastructure (exosystems); neighborhoods, libraries, and communities (mesosystems); and families (microsystems; Bronfenbrenner, 1977). This model does not directly address differences in culture between ecological nested systems and adult–child design partnerships.

This model is the beginning of how design partnerships in libraries can be better understood. We encourage

future studies to examine this model and remix it based on new cultural and economic contexts. We have already begun to explore this question of ecological systems through developing adult–child design partnerships with rural libraries (Yip & Lee, 2018).

8 | CONCLUSION

In this article we have examined the roles a youth librarian can take on in PD. We have presented a conceptual model for codesign partnerships with librarians that has strong potential for future research in libraries and informatics. Design researchers can examine how to adapt this model for adults who engage in multiple responsibilities but need to develop programming and activities. Such stakeholders could include educators, museum professionals, and community volunteers, who have other responsibilities but want to engage in codesign with their user-groups (for example, students, patrons). Future work needs to consider the kinds of supports needed to sustain PD practices for librarians beyond design researchers. Finally, we developed our dimensions of participatory librarian roles through an in-depth case study analysis of a single librarian and his codesign experience with youth. More research needs to be conducted on a wider group of youth librarian experiences with PD.

In conclusion, our study has developed a clear conceptual model for design researchers to better understand the roles that librarians play when they engage in PD practices. The findings address the need for a model that allows us better insight into what constitutes a design partnership for youth librarians specifically. As digital learning activities become more pervasive, the need for instructional design skills will be sought after more for both MLIS and veteran librarians. Therefore, we believe there will be a need to understand more deeply the tensions and shifting roles of the participatory youth librarian for future PD work in libraries.

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