Facilitating Connected Learning PD for
Library Professionals through Design Cycles

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Abstract: Libraries are centers for learning, with library professionals key to delivering programs, activities, and resources for their community. To facilitate learning in libraries, it is essential for library staff to participate in high quality professional development (PD). In this paper, we consider how PD using design cycles allows library staff to design ideas that incorporate connected learning principles. Findings indicate that design cycles are concrete mechanisms for centering patron needs and interests and activities and materials for the library. The design cycles highlighted assets for design, including community knowledge and librarian autonomy, as well as barriers to testing and implementation. Our study answers a call to reconsider existing models of library PD and extends current understandings of designing for CL by first applying the CL model to library staff, encouraging them to connect their own interests and building their capacity as learning brokers, before then taking an iterative approach to designing for CL in their library.

Libraries are centers for learning, providing a blend of resources, activities, and spaces for youth and adults. Within these spaces, librarians are key to the overall learning landscape and responsible for dynamic, connected learning experiences tailored to learners' interests (Braun, et al., 2014) not just by providing books and materials, but also by facilitating active learning (Covin et al., 2021). As the library sciences field is constantly evolving, particularly around emerging technologies, library staff are challenged to maintain the knowledge and skill sets needed to deliver programs and serve their community members (Stephens et al., 2019). In order to facilitate this learning in libraries, it is essential for library staff to maintain and enhance knowledge through lifelong learning and high quality professional development (PD) (American Library Association, 2007; Stephens et al., 2019).

The development of libraries is aligned with connected learning (CL) principles, promoting peer-supported, interest-driven, and academically oriented activities (Ito et al., 2020). By embracing the principles of CL, today's libraries and their dedicated staff strive to create safe and engaging spaces for young individuals to learn, socialize, and connect, becoming crucial players in shaping future innovators and problem solvers (Larson et al., 2013). In prior research on library PD, library professionals emphasized a desire for opportunities to engage actively and share ideas with others (Stephens et al., 2019), as well as a need for creative, innovative, experience-based learning to appeal to their interests and motivation for learning (Leong, 2014). Using design cycles can be a powerful mechanism to meet this need, yielding active, context-specific, and engaging PD in library settings that builds capacity in the CL model. Design cycles offer experiential and collaborative learning opportunities, where library staff share expertise, learn new technologies and skills, and work together toward creating new programs, materials, and assessments.

In the 2020 report on a decade of CL scholarship, Ito and colleagues issued a challenge for the next phase of work in CL, articulating a need to incorporate community engaged research, and to reconsider existing models of PD, encouraging library professionals' development of "capacities as brokers and sponsors in addition to their roles as content experts" (p. 65). By bringing design cycles into CL PD for librarians and library staff, we aimed to answer this call. Our study extends current understandings of designing for CL by first applying the CL model to library staff, encouraging them to connect their own interests and building their capacity as learning brokers, before then taking an iterative approach to designing for CL in their library. Our study is situated in the context of a PD series, *CL+Design*, which combines design cycles with CL in library spaces. We aim to answer the following research questions:

- How can *CL+Design* PD cycles allow library staff to design ideas that incorporate connected learning principles around library spaces, programs, and assessments?
- How can *CL+Design* PD cycles illuminate assets and barriers facing library staff agency?

Theoretical Framework
This study is rooted in the connected learning framework (Ito et al., 2020; Windman et al., 2020), an ecological theoretical perspective on learning that emphasizes the importance of CL experiences across the home, school, and informal community settings (Ito et al., 2020; Windman et al., 2020). CL occurs when learning environments connect with personal interests, offer supportive relationships, and provide new opportunities to foster academic, civic, and

career growth. CL informs not only the content, but also the design of the PD program by building from librarians' *interests* to select the topics of the PD sessions, forming positive *relationships* between librarians and researchers, and providing *opportunities* for librarians to learn about the CL framework and apply it in the design of programming for youth and families.

Methods

This study adopts community-based (Bang & Medin, 2010), design based research (DBR), as a collaborative methodological approach that involves stakeholders and researchers working together to design solutions for educational problems (Subramaniam et al., 2021). We used an iterative DBR approach guided by core principles such as building trust and rapport with community members and stakeholders as well as recognizing and valuing diverse forms of knowledge (Bermudez et al., 2023; Leavy, 2017). DBR is a valuable approach for designing activities, materials, and assessments to enhance education (Edelson, 2002) and is particularly relevant to vibrant learning spaces filled with diverse educational resources and activities such as libraries (Covin et al., 2021). Specifically, our PD program was designed to support library staff to dream, develop, design, and evaluate programs and activities based on a CL lens.

PD Program Design

The *CL+Design* PD program design is rooted in constructionism, understanding that individuals construct knowledge as they engage in the creation and sharing of artifacts, leading to learning that is personal, social, and cultural (Papert & Harel, 1991). Constructionism's synergy with technology and design is further marked by its application as a framework in the design of school interventions and PD programs (Kynigos, 2015). We developed the *CL+Design* PD program to be responsive to librarian interests. The goal of the program was to build capacity around the CL framework to support library programs. We chose to lean into designing for CL so that PD activities had practical applications for library staff, imagining that they would be able to apply their designs to their respective library sections. Work around design cycles was continuous and scaffolded throughout the PD sessions (see Figure 1).
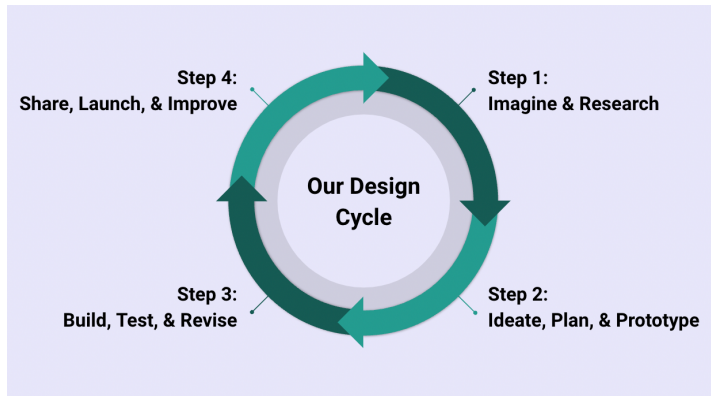

Figure 1. CL+Design PD design cycle in four steps.

A particular asset of CL is the centrality of participant interests. We incorporated librarians' interests at three points: 1) with a survey prior to beginning the PD series, 2) by aligning PD activities with the themes and topics from the design process, and 3) by providing direct choice. Discipline specific content was selected in alignment with librarian interests, and in connection to technology, arts, and maker culture. Table 1 shows the sequence and description of the PD sessions. Figure 2 shows examples of the resulting artifacts.

Table 1. Sequence and description of the *CL+Design* PD design.

Topic	Design Activities
(1) Visioning and setting design goals	Vision board and paper circuits Sticky noting of goals and clustering
(2) Designing toward youth interests	Generative AI for storytelling

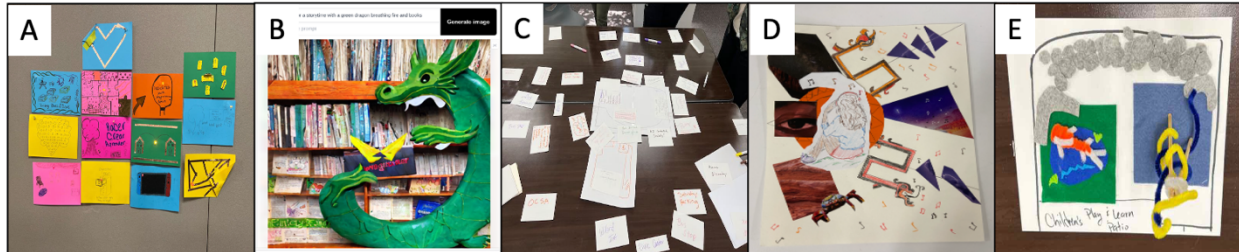| (3) Designing toward relationships and networks | Community cultural mapping and dérives |
| (4) LatinoFuturism and restorying | Restorying, speculative futures artwork and writing |
| (5) Playful learning | Creating playful learning structures using arts and crafts |

Figure 2. Physical and digital artifacts resulting from the *CL+Design* PD design activities. *Note.* The figure shows the shared vision board created (A), an image created by a librarian using stable diffusion for visual storytelling (B), network mapping activity (C), artwork based on LatinoFuturism (D), and playful ideas that could be incorporated in the library's playground to scaffold learning.

Data Gathering and Analysis

Five PD sessions took place monthly from February 2023 to June 2023, each lasting two hours. All PD sessions were held at a main branch public library in North Orange County, California predominantly serving Latine community members. Participants included a total of 14 librarians and staff from a mix of library departments including: children, youth/teen, book mobile, adult, and technology. The authors of this paper designed and facilitated the PD sessions along with two additional doctoral students with relevant discipline-specific knowledge related to the PD series. Each session consisted of an icebreaker activity, a theoretical introduction related to the topic, a design activity where librarians connected the topic to their library space and shared these ideas out to the group, and summaries of the following: PD goals and upcoming sessions, CL theory, and librarians' themes of focus and project ideas.

We conducted qualitative analysis on two sets of researcher fieldnotes from PD sessions, survey questions, constructed artifacts including two written brainstorming activities (post-its and google slides), and five making projects, (see Figure 2). To study the ways the design process allowed librarians to generate CL design ideas while illuminating insights around structural assets and barriers, we used a mix of deductive and inductive processes (Azungah, 2018). To address our first research question, we deductively coded for librarians' incorporations of *interests*, *relationships*, and *opportunities* in their design ideas. We then surfaced the *assets* and *barriers* to library staff agency through inductive analysis across design cycles to address our second research question.

Findings
The CL Model and PD Design Cycles

The use of iterative design cycles in PD allowed librarians to consider the CL model on two levels. As the library staff learned about CL in the first PD session, they initially connected the model to themselves, starting with their own interests within the library (e.g., literary genres, maker spaces, or technology). By centering themselves in the CL model, they developed a deeper understanding of the theory, considering their own programmatic and spatial interests in the library, their relationships with one another and their patrons, and the opportunities they have to learn more about technology, to collaborate, or to build new programs. This step generated initial ideas around envisioning futures for the library that were aspirational and personal, but somewhat abstract. Take for example, ideas generated during the first PD session focused on "Visioning and Setting Design Goals" (see Figure 3). Before engaging in design cycles, librarians participated in an initial visioning activity where they used paper craft and circuitry to highlight their ideas. The results were general outlines of the use of space.

Figure 3. Examples of visioning before introduction of design cycles.

After exploring the CL model on a personal level, librarians began to formulate design goals that centered their patrons in the CL model. From here, they shifted focus from personal interests to those of their community members, specifically toward patrons who visit and interact in their particular departments (e.g., children, teens, adult services). They began to consider who their patrons are, what they say they want and need, and what programs and resources might be lacking or underdeveloped in the library. As they formulated design goals, librarians generated more specific, community-centered themes that incorporated the CL model (i.e., inclusivity, agency, partnerships, addressing the digital divide, outreach, and attention to specific content areas around inclusion and technology) that seeded the design projects for the rest of the PD series (see Figure 4).
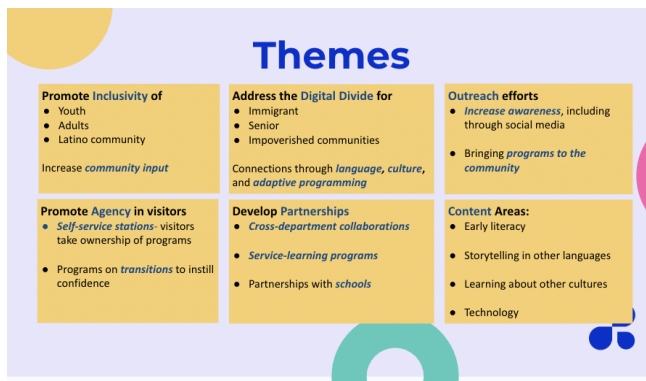

Figure 4. Themes and topics generated from setting design goals, after introducing design cycles.

Design cycles became an instrumental mechanism for moving ideas from abstract to more concrete and for centering community needs. Library staff began to frame their own interests as areas of expertise that they could use as they considered how to learn about and build around their patrons' interests, how to encourage relationships between patrons and librarians, patrons and their families or peers, and opportunities for learning (e.g., language, technology) and connecting to career resources. Using the first two steps of our design cycle (see Figure 1), library teams turned their visions into concrete project design ideas and plans that incorporated CL principles around library spaces, programs, and assessments (see Figure 5).

Figure 5. Project ideas and plans that emerged from the design cycle, in consideration of the CL model.

Design Cycles for Understanding Assets and Barriers

Assets. Engaging in design cycles, particularly the first two levels of the design cycle, provided opportunities for understanding the assets and barriers facing library staff, as well as how and where they are able to apply their ideas and designs to the library. One asset, the staffs' knowledge about and connection to their community, became clear through stories shared about family and heritage connections. One librarian shared that her aunt had worked for the city in the department of parks and recreation, while another shared that they had gotten married at the courthouse next door. Many library staff also expressed a passion for caring for the most vulnerable members of the community, "Something that stands out is a lot of homeless people who are often overlooked. I've helped and engaged with them before. I've gotten a 'thank you for helping us, for seeing us.'" Design cycles surfaced librarians' deep knowledge, connection, and commitment to the community as a distinct asset in designing context-specific programs and materials.

Another asset is the high level of autonomy and creativity library staff have in creating programs for their sections and patrons. While there may be restrictions based on staffing, and holiday or thematic directives, library staff are able to assert their own interests and choices into their department programs. For example, when the children's services team participated in the PD focused on AI generation, one librarian used ChatGPT to create a St. Patrick's day story time outline then implemented it, while a librarian in the teen sections used ChatGPT to come up with a teen leadership skill building program. Additionally, the library teams were keen to interact with and plan together, demonstrating an interest in cross-collaboration and connection to one another's interests.

Barriers. As we tried to move out of prototyping in the design cycle and into building and testing, we encountered barriers to librarian agency around designing and implementing programs, materials, and assessments for their departments. One such barrier is structural. Libraries are public resources, and as such are at an intersection of interest from the public and from city officials (Colvin et al., 2021). This puts them in the crosshairs of different budgetary and political ideas as well as the desires of the public. One way this structural barrier plays out is in the ways information is disseminated or withheld from library staff. An example is in access to patron assessments. One librarian expressed her frustration with being unable to access information about patron interests saying, "People give good responses over social media but not many come in … We need more community input so that we know what they want." She did not have the ability to learn from online patron assessments about her own programs. Library staff also shared that while they are often consulted about new programs or facilities changes, there are so many stakeholders that the librarians' ideas are often lost along the way when final decisions are made.

Another barrier that emerged was stakeholder resistance from patrons, community members, and city officials to evolving technology use. While librarians see changes in technology, including advancement in AI as a learning asset requiring continued education, they describe parts of the community as conservative and resistant. Many parents in the children's section reject *Moxy* the learning robot due to privacy concerns; it's difficult to reach out to seniors and teach them to use new technologies; local artists have concerns about AI's infringement on creativity; and city officials worry about copyright infringement. These are meaningful public concerns but are also real barriers to the library staffs' ability to advance programs and learning. For example, a technology librarian wanted to promote an art workshop and art show using AI image generation to engage tech savvy teens and reduce barriers to creating skills-based art. Rather than being allowed to move forward and address complex issues with the art show, his efforts were halted.

Discussion

By designing with, rather than for, the library staff, we aimed to support them in developing and implementing programs that support meaningful change within the community. Moreover, this collaborative approach allowed us to identify and address the assets and barriers faced by the librarians, leveraging their expertise in understanding the community and patrons to ensure the effectiveness and sustainability of the programs and activities. The use of design cycles holds practical applications for designing PD around CL, particularly around how librarians shifted from centering their own interests and experiences to those of their patrons/community. Using design cycles can afford library staff the chance to envision futures, discover where their collective interests and visions align, and determine concrete ways to develop and test their ideas. Furthermore, CL+Design cycles using a constructionist approach to making and learning provide a fruitful outlet for librarians to leverage their deep knowledge of community patrons and creativity, while providing them autonomy in the design process.

While library staff showed enthusiastic engagement in the imagine and ideation steps, tensions arose when building and testing as they recognized the limitations to building or implementing some of the programs within the realities of their library contexts. Another limitation of the study was the short duration of the PD program and the scope of the project. Given the short PD duration, participants did not revise and iterate librarians' programs for youth and families, which is an important aspect of a community-based DBR methodological approach.

PD design cycles using community-based DBR and building from participants' interests allowed us to apply the CL model to educators in a library setting, helping them build capacity as learning brokers across the library and community settings, rather than just further developing them as content experts. This study answers the call set for by Ito and colleagues (2020) to reconsider existing models of library PD and advances current understandings of designing for CL by first applying the CL model to library staff, encouraging them to connect their own interests and building their capacity as learning brokers, before then taking an iterative approach to designing for CL in their library. Finally, the study provides insights into the assets and barriers librarians experience in the full implementation of the CL model. PD programs that incorporate multiple stakeholders from the library systems and that provide support to librarians through the full design process, including launching and improvements, are promising venues for addressing hurdles and truly implementing *CL+Design* PD cycles in meaningful ways that directly affect programming for community patrons.

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