



***Designing the Library of the Future for and with Teens: Librarians as the “Connector” in Connected Learning**

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Abstract

Teen services librarians are well positioned to embrace connected learning principles in designing and implementing teen programs and services at their libraries. Due to the proliferation of participatory culture among teens, it is crucial that teen services librarians obtain teens’ voices (especially from non-dominant teens) as they conceptualize, design, implement, and evaluate connected learning programs and services for teens. By illuminating the desired librarian-teen engagement practices in connected learning using Radical Change theory, this paper describes six cooperative inquiry techniques utilized by human-computer interaction scholars to co-design technologies and learning programs with children that can be adapted for designing library programs and services with and for teens. In addition to explaining these techniques, potential ways that these techniques can be used by teen services librarians are presented.

Introduction

The emergence of newer technologies (e.g., ubiquitous computing, mobile computing, wearable technologies) has led to a “participatory culture,” challenging the notion that there are designated experts who produce knowledge while the public consumes this knowledge. Through participatory culture and leveraging the power of newer technologies that have revolutionized the speed and capabilities of knowledge production and dissemination, the public can now be problem-solvers and experts themselves regardless of their formal education and training.ⁱ This participatory culture has also transformed learning, particularly in skills that are needed to ensure productive participation, such as collaboration, self-direction, systems thinking, information literacy, and design thinking.ⁱⁱ The development of these skills among youth is challenging within the context of formal learning environments, such as schools, where learning is almost always in situ and normalized, whereas youth learn outside of school through interactions with their surroundings, community, peers, adults, and technology.ⁱⁱⁱ Unfortunately, in school classrooms students are often restricted from using these newer technologies due to the demands of the school curriculum, testing pressures, time limitations, malfunctioning equipment, stringent firewalls, and school policies that consider these technologies a distraction.^{iv} This results in a dichotomy that is often used in education and experienced by students themselves: the formal

(in-school) and informal (out-of-school) learning, which many scholars acknowledge as a problematic distinction but one that is commonly used.^v

The connected learning framework developed by Ito and colleagues elegantly unites these informal and formal learning pursuits by articulating a vision for leveraging networked technologies to promote learning experiences that are academically oriented, peer-supported, and interest-driven, as well as production-centered, openly networked, and grounded in a shared purpose.^{vi} This framework champions the use of emerging technologies to support connected learning by strengthening young people’s access to knowledge and information, offering timely feedback and individualized and collaborative learning experiences, and linking youth to adult mentors who have expertise in an area of shared interest.

The *Future of Library Services for and with Teens* report calls for reimagining the position of libraries to promote the three spheres of learning (interest-driven, peer-supported, and academically-oriented) among non-dominant teens, as described in the connected learning model.^{vii} Public libraries continue to be a place whereby non-dominant teens can feel comfortable and are encouraged to explore networked technologies.^{viii} Non-dominant teens—who often come from low socioeconomic backgrounds, immigrant families, and minority groups—struggle to formulate the connections between these three spheres because access, literacy, and support from adult mentors are often lacking for them compared to their more privileged counterparts.^{ix} Teen librarians need to know how to work with youth from non-dominant groups who need libraries the most.^x To build teen services librarians’ capacity to encourage connected learning among non-dominant teen groups, teen services librarians will need to offer programs and services that meet these teens where they are and inspire them to push their current boundaries of learning. Surveys, interviews, and forming a teen advisory council are no longer sufficient when designing teen programs. Instead, it is time to involve teens themselves as co-designers of programs and services. Teen services librarians need to apply interdisciplinary approaches to establish equal partnership and learning opportunities that facilitate discovery and use of digital media. Such approaches are informed by research, methods, and best practices in disciplines outside of library and information science.^{xi}

In this paper, I will provide a brief overview of connected learning, the radical changes that teen services librarians will need to embrace to be the “connector” in connected learning, and the theoretical underpinnings of participatory design methods that can be used by librarians with youth to ascertain equal partnership with teens. I will then discuss selected participatory design techniques that have been used to design learning technologies in the field of human-computer interaction, which in turn can be adopted to design library programs, spaces, and services to enhance connected learning programming and services in libraries.

Literature Review

Connected Learning in a Nutshell

The ways teens learn, what they want to learn, and what they have to learn to be productive members of society have changed significantly in the recent decade. With the need to master emerging literacies, learn and communicate via networked technologies, and the preference to learn via mentorship and peer support compared to direct instruction, teens’ learning processes and preferences are constantly changing.^{xiii} Ito and colleagues brought together these current

trends in learning to develop a framework called connected learning, which they characterize as a framework “under constant development that offers principles and examples to be adapted and remixed rather than a template for programs and activities [for learning],” precisely situating the learning process that is experienced by teens in the digital and information age.^{xiii} In other words, connected learning is not afforded by a specific type of technology genre or platform, but embraces learning using networked technologies. In their seminal article about connected learning, Ito and colleagues define connected learning as “learning that is socially embedded, interest-driven, and oriented toward educational, economic, or political opportunity.”^{xiv} Driven by the technological, social, economic, and cultural changes in the society, connected learning is driven by an “equity agenda” that focuses on increasing learning opportunities for non-dominant youth.^{xv} Interest-driven, peer-supported, and academically oriented are three learning principles of the connected learning framework. Each of the principles is briefly discussed below:

- *Interest-driven*: “When a subject is personally interesting and relevant, learners achieve much higher-order learning outcomes.”^{xvi} Personal affinity and engagement are the primary drivers for interest-driven participation. Ito and colleagues emphasize that interests can be developed and nurtured, in addition to teens’ inherent interests, such as personal hobbies, media, and so on.^{xvii} These interests and passions can be nurtured to allow the growth of diverse identities.^{xviii}
- *Peer-supported*: “In their everyday exchanges with peers and friends, young people are contributing, sharing, and giving feedback in inclusive social experiences that are fluid and highly engaging.”^{xix} Such smooth interactions are not only between peers but can be facilitated or mentored by an adult (e.g., parent, librarian, teacher, etc.).
- *Academically oriented*: “Learners flourish and realize their potential when they can connect their interest and social engagement to academic studies, civic engagement, and career opportunities.”^{xx} Ultimately, teens learn the most when they are able to leverage their interests and connections for academic relevance.

The core properties of connected learning experiences are that they be “production-centered,” with a “shared purpose,” and be “openly networked.”^{xxi} Connected learning is “production-centered” because learners can utilize a variety of digital media tools to produce knowledge and cultural content through the practices of remixing and curation. It has a “shared purpose” because learners unite through shared goals and interests, creating cross-cultural and cross-generational learning. “Openly networked” refers to “online platforms and digital tools . . . [that] . . . make learning abundant, accessible, and visible across all learner settings.”^{xxii} While connected learning is applicable to any age group, Ito and colleagues explicitly point out its relevance to teens because the teen years are a “critical time when individuals form interests and social identities that are key to the connected learning model.”^{xxiii}

Radical Change in the Approach to Programming

To be the “connector” in connected learning, teen services librarians will need to fundamentally change the way they work with teens and how they offer programming for teens at their libraries. In order to realize connected learning in libraries, teen services librarians must acknowledge that teens have their very own interests and desires that deserve valid attention. It is imperative that teen services librarians understand these interests by intentionally talking to teens about their

interests, listening to them, facilitating non-dominant teens to voice their opinions, and reflecting on their roles and positions as they engage in these conversations with teens.^{xxiv} To transition to these new roles and practices successfully, a radical change in the way that librarians work with teens is warranted to ensure that teens are equal partners in designing programming and services.

To explain this transition, I build upon Radical Change theory, developed in the 1990s by Dr. Eliza Dresang. Originally intended to explain changes evident in the *Black and White* picture book (winner of the 1991 Caldecott Medal), Radical Change theory over the last decade has been expanded to explain digital age books and digital age youth information behavior.^{xxv} The theory has been acknowledged as being robust in terms of interpreting and predicting youth-related phenomena. Radical Change theory is rooted in the digital age principles of interactivity, connectivity, and access. Interactivity refers to “dynamic, nonlinear, and nonsequential learning and information behavior” that can be controlled by youth.^{xxvi} Connectivity is the change in perspectives encountered by youth as they interact with their community and construct meanings of their social worlds. Access refers to penetrating “information barriers, bringing entrée to a wide diversity of formerly large inaccessible opinion.”^{xxvii} I utilize these digital age principles to establish three types of changes that librarians will need to embrace when working with teens in designing library programming and services, resulting in a typology of radical change (modeled after Dresang and Koh’s approach in 2009^{xxviii}) as presented in table 1 below.

Table 1: Radical Change Typology: Digital Age Teen-Librarian Engagement

Radical Change Types	Questions	Characteristics
Type 1: Changing forms of engaging teens	How do teens voice their interests and passions?	Obtaining teens’ voices through participatory design Adopting interdisciplinary approaches to capture teens’ voices Being aware of methods and techniques to work with non-dominant teens
Type 2: Changing perspectives	How do teens view libraries and librarians?	Transitioning librarians’ roles from experts to facilitators Expanding the ecology of learning in libraries beyond books to digital media and social networks Developing programs that appeal to every culture, every teen, year-round
Type 3: Changing boundaries	How do teens connect with everyone around them—their	Strengthening relationships that empower learning within

	peers, their family, their librarian, and their community?	and outside of their communities Expanding “library learning” to places beyond the library such as home, school, community, etc.
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Type 1 refers to the need to change forms of engaging with teens to obtain their thoughts and feedback on teen programming and services in libraries. To capture the voice of teens—and especially non-dominant teens who may potentially benefit the most from library programming and services—we need to devise participatory design methods to create programs for and with them. Type 2 refers to the need to change teens’ views of librarians and libraries. Librarians need to be ready and willing to transition from expert to facilitator, engaging in active and continuous learning for and with teens to “re-imagin[e] services and spaces.”^{xxxix} Teen services librarians will need to design programs and services that appeal to every culture and every teen year-round, not only seasonally. Having poetry-related activities solely during National Poetry month or having programs that appeal or appreciate African American culture exclusively during Black History month is no longer acceptable. Additionally, libraries can no longer simply emphasize their book collection alone or have programming solely based on book-related activities. Books are just one of many media types that teens are interested in; their ecology of learning is expansive and includes technology, movies, music, and so on. Type 3 refers to changing the boundaries of youth engagement to extend beyond the library building and its resources. Librarians can no longer quantify the success of their libraries based on how many books or resources have been checked out or the number of teens entering the doors of their libraries. Librarians need to develop dynamic community partnerships that reach beyond the library, specifically “building partnerships and collaborations in their communities.”^{xxx} Youth learning is boundless and centered on relationships—relationships between teens and library staff and between teens and the broader community. These relationships result in connections that allow libraries to create an evolving collection of programs and services that meet the requirements of individual teens and teen groups at any moment of need.

Participatory Design Methods

While the characteristics of forms and perspectives of teen-librarian engagement in the digital age as seen through the lens of Radical Change theory (see table 1 above) may seem avant-garde in librarianship, such an approach to engaging users has been utilized for decades in the design of technologies for adults and young people. Participatory design had its beginnings in Scandinavian countries, specifically incorporating workers’ voices into the shaping of work environments and technologies.^{xxxi} From its humble beginnings in work environments for adults, techniques used in participatory design have taken various forms, names, and contexts, including expansion of use to include children in the design of technologies as co-designers and not just as users. Druin describes the distinctive ways that children can play a role in the design of technologies—in a range from low to high involvement.^{xxxii} These roles rest in a continuum that describes the nature of the child’s participation from *user* to *tester* to *informant* to *design partner*. Falls, Guha, and Druin indicate that “as [a child] moves along the continuum, the role encompass[es] those at the less involved level.”^{xxxiii} While the roles that children play in the

design of technologies can be any one of the above-mentioned roles, the most involved role is the role of children as design partners. Since 2000, the idea of children as design partners has been the most widespread as compared to the other roles that children can play in the design of technologies. In this design partner role, “children become equal team members and stakeholders with adults. . . . [A]dults and children work as teammates in technology design.”^{xxxiv} Researchers have found that involving children in the design of technologies for children results in ideas and technologies that go beyond the concepts that adult researchers think of themselves.^{xxxv}

While participatory design methods and techniques are used in areas such as finance, broadcasting, and psychology, a close examination of these articles reveals a strong theoretical origin and practice in participatory design research in human-computer interaction. There are several participatory design methods for designing technologies with and for youth, including bluebells, bonded design, and cooperative inquiry. In the bluebells method based on British playground games, articulated by Kelly et al., children between the ages of 7 and 9 engage in the design of technology utilizing the “play” metaphor.^{xxxvi} Adopting a more serial approach to design, adults work together to design the system *before* play, followed by children engaged *during* play, and concluded with adults engaging in the design process *after* play. The “play” here refers to the stages of the actual design process. During “play,” children participate in four different activities named after playground games that are directly related to a part of the technology that is being designed (i.e., the context, the content, navigation, and the interface). Adults observe children during play, and then discuss their observations and analyze the artifacts after the play.^{xxxvii} In the bonded design method, children between the ages of 11 and 12 work together with adults frequently over a short period of time (i.e., a couple of times per week for six weeks) on a single project. In addition to being engaged for only a certain stipulated time period, children are not equal design partners, and their roles lie somewhere between being the informant and partner of the design process.^{xxxviii}

There are three reasons why the cooperative inquiry method is particularly relevant to teen librarianship: (1) It can be used and expanded to work with children and teens (ages 5–17), whereas the other participatory design methods are typically used in working with children (typically 7–12 years old); (2) cooperative inquiry emphasizes building and sustaining the design partnership between adults and the children/teens on a longer-term basis (not a one-off) that spans across multiple collaborative projects, which is ideal in a library environment, where teens and librarians regularly see each other and have a sustained relationship; and (3) children/teens are equal partners throughout the design process, actively involved in technology design from conception to completion and are not just product testers alongside adult designers.

The goal of cooperative inquiry is to use a wide variety of ideation and evaluation techniques so that children, teens, and adults can share ideas in ways that maximize idea elaboration yet minimize differences in age, ability, and communication styles. Some techniques may need to be modified to accommodate developmental differences among different age groups (e.g., teens may ask for more structured design prompts; preschoolers will need help collaborating).^{xxxix} A cross-comparative analysis of these above-mentioned participatory design methods is further detailed in Fails, Guha, and Druin.^{xl} Techniques associated with each of these above-mentioned methods have been utilized to answer various technology design questions in the human-computer interaction field.^{xli}

To be able to realize the three learning principles and three core properties of connected learning in the library, librarians must attempt to achieve all three of the Radical Change theory characteristics listed in table 1. This can be done by leveraging the techniques associated with participatory design methods to design programming and services for and with teens.

Objectives

As mentioned earlier, the cooperative inquiry method is the most relevant participatory design method for teen services librarians. Thus, the objective of this paper is to explain selected cooperative inquiry techniques that can be utilized by teen services librarians and to suggest potential scenarios whereby teen services librarians can adopt these techniques to increase teen-librarian engagement as indicated in table 1.

Methods

A thorough examination of a decade's worth of research literature on cooperative inquiry techniques (2005–2015) yielded twenty-three peer-reviewed articles and conference papers from the human-computer interaction field that clearly indicated the use of one or more cooperative inquiry techniques. Five- or ten-year spans are relatively standard for analyzing methodological trends of specific domains.^{xlii} These peer-reviewed articles and conference papers explain one or more of the following: the foundation for the cooperative inquiry method, a selected cooperative inquiry technique or techniques involving children/teens in the design of technology or learning programs, and an extended explanation of the choice of cooperative inquiry technique in the design of specific technologies and learning programs (beyond simply saying that they used a selected technique). All these articles focus on children and adolescents between the ages of 5 and 17 years old.

Findings and Discussion

In this section, I will share five cooperative inquiry techniques that have been predominantly used in the human-computer interaction field to design technologies and learning programs with children and teens. For each of these techniques, I will describe the technique, how it was used, and how teen librarians can use it when working with teens.

Bags of Stuff

The formal name for this brainstorming technique with youth is *low-tech prototyping*, but it is fondly referred to as *bags of stuff*.^{xliii} With the primary goal of creating multiple solutions to an early stage design problem, groups are formed with a balanced mix of adults and children/teens (2–3 young people with 2–3 adults).^{xliiv} A problem is presented to the large group, and then each group receives a “bag of stuff,” which has arts and crafts materials, such as construction paper, crayons, glue, tape, scissors, yarn, cotton balls, and so on, as well as “found objects” like leftover Styrofoam packing, wine corks, old LEGO pieces, small boxes, etc. Depending on the nature of the problem, appropriate three-dimensional materials (e.g., matchboxes to represent computers, or bells and noisemakers to represent auditory objects for an audio project) are also provided.^{xliv}

Using the materials provided in the bag, each group brainstorms a solution to the problem and designs “low-tech” prototypes of their solution. Due to the nature of low-tech prototyping and

Mission to Mars

In Mission to Marsⁱ (inspired by the brainstorming technique of fictional inquiry), teens interact with “Martians” who are adults. The “Martian” adult will be in a different room than the teens, but will be able to communicate via video-conferencing technology such as Skype, Google Hangout, and so on. The “Martian” adult will initially broadcast a message in the form of asking for a potential solution or providing a prompt to the teens. Then the Martian can opt to go offline or stay online, and the teen design partners work in small groups on solutions to the prompt or problem that the Martian has presented.^{li} The brainstorming time given to the teens ultimately depends on the nature of the problem presented and the time that the teens and adults can allocate to this technique. The session culminates with each group of teens presenting their ideas to the Martian. The “fictional” part of the inquiry is the use of the “Martian” concept, which allows teens to be more open, honest, and descriptive because they are creating an idea for a “Martian” rather than a human adult or librarian. The adult designers take notes or view the recordings of the video to amass the big ideas that were presented by the teens.^{lii liii}

Teen librarians can utilize this technique in the design of programming and services that they intend to offer to teens. The key is in the articulation of the problem or prompt by the “Martian.” This technique is perfect for exploration of novel ideas or adoption of new technologies or trends in the library, whereby the teens will need to explain in detail to the Martian how they would like a technology or innovation to be deployed at the library. For example, the Martian can provide the teens with the following prompts: “For the first time ever, Mars is about to explore gaming in our libraries. How do we design our library space so that teens come to play games with each other at the libraries? What gaming application, accessories, and support should we provide? How can we launch this new gaming initiative in a way that the Martian teens will actually come and play games at the library?” The gaming example provided here can be replaced with any other new genre of learning or innovation.

Layered Elaboration

Fails, Guha, and Druin indicate that youth are oftentimes uncomfortable messing with or ruining the work of other youth and adult design partners. “Even if the work in question is a low-tech, initial, brainstormed prototype, designers, especially youth design partners, can be sensitive to changing the work of others.”^{liv} Hence, the *layered elaboration* technique works well because it allows designers to elaborate on ideas by changing, extending, adding, and/or eliminating the ideas of others without killing the original ideas or ideas that are thought of throughout the process. To begin, teens in a whole group are provided with either a base design, or they can design from scratch.^{lv} In small groups, teens sketch their designs using permanent markers on plain white paper attached to clipboards. In a dedicated interval of times (typically every 15 to 20 minutes), all groups come together for a meeting where each group briefly presents their ideas. These large group meetings allow elaboration on the designs so that the next iteration can occur. After the first large group meeting, the first iteration of the idea is then transferred to a clear transparency film and passed to one of the small groups. This group places a clear overhead transparency on top of the initial idea and adds their ideas to the initial storyboard. This process is repeated until each group has had an opportunity to include their design ideas. In this way, all changes are layered, and any elimination is indicated by crossing out ideas. A final debrief meeting is held after all groups have had a chance to provide their design ideas. During the debriefing, an adult design partner will capture the big ideas on a whiteboard or a large sheet of

paper. The layered elaboration technique has been successfully utilized in the design of screen-based media.

Teen librarians can utilize this technique for the design or redesign of physical or virtual spaces at the library and/or web pages. Due to the nature of teens' visits to libraries that are on a drop-in and unstructured manner, teen services librarians can adapt this technique to work with groups of teens who visit the library at different times to build on each other's ideas. In this way, teen services librarians can also take note of the different ideas that originated from teens with varying interests and consider their preferences in the design of physical and virtual spaces. Additionally, this method can be used when teens are collaboratively designing a station in a makerspace, designing and building an artifact for the community, designing the display of collections at the library, and so on.

Figure 2: Layered Elaboration Technique



Photo credit: Kidsteam, Human-Computer Interaction Lab, University of Maryland

Big Paper

The *big paper* approach is a two-dimensional brainstorming technique that allows teams of adults and teens to “collaboratively work on one idea” using a large piece of paper that is placed on the floor or on a table.^{lvi} Instead of using small sheets of paper, brainstorming uses large sheets of paper, which allows design participants to gather around one workspace, and hence provides adult and teen design partners an equal voice in the generation of ideas. To facilitate discussions, adult designers can divide the large sheet of paper into three sections: What, Why, How; these will allow teen co-designers to sketch out their questions, challenges, and design ideas.^{lvii}

Figure 3: Big Paper Technique



Photo credit: Kidsteam, Human-Computer Interaction Lab, University of Maryland

Teen librarians can utilize this technique for the design of an entire arc of programming that they would like to offer for an extended period of time. Librarians can provide teens with general or specific genres such as gaming, fan fiction, science-infused movies, superheroes, sports, music, fashion design, and so on, which will allow teens to come up with their own programming and activities centered around these genres.

Sticky Noting

Used primarily for evaluation of certain products or services, *sticky noting* is a rather simple cooperative inquiry technique. In designing technologies, teens use sticky noting to evaluate an existing technology or critique a prototype that is under development (either working or low-tech prototypes).^{lviii} For this technique, pens/pencils and sticky notes (also known as Post-it notes) are needed. All adults and teen design partners use or view a technology and begin writing their likes, dislikes, surprises, and design ideas on the sticky notes. The rule of thumb to remember in the execution of this technique is that each like, dislike, surprise, or design idea must be written on a separate note. As the notes accumulate, adult design partners will typically gather them all and stick them on a large wall space or whiteboard. One adult design partner (or sometimes two) will group the sticky notes into categories (likes, dislikes, surprises, design ideas) and subcategories (thematic elements that emerge within the larger categories, such as navigation, look and feel, color, etc.). Typically, the whole group will come together at the end of this exercise to discuss and review the themes that emerged. This results in an informal frequency analysis that points to the fertile direction of the next iteration of the technology. This evaluation technique has been successfully used in the design of many innovative technologies, such as the International Children's Digital Library, the I'm Going Bananas game, and ScienceKit.^{lix}

Teen librarians can utilize this technique to evaluate the design of existing physical or virtual spaces at their library, programming, and/or services. Additionally, they can sketch prototypes of new physical or virtual spaces at their library or the library programming and obtain feedback from teens at any stage in the development.

Figure 4: Sticky Notes Clustered into Themes on a Whiteboard



Photo credit: Kidsteam, Human-Computer Interaction Lab, University of Maryland

Conclusion

This article is one of the first to promote the use of participatory design techniques informed by research in other fields that can be adopted by teen librarians, particularly in capturing youth voices. While it is not meant to be an exhaustive list of cooperative inquiry techniques, the techniques shared here shift the power dynamics in the library, from librarians being experts to taking on the role of facilitators and design partners. In order for libraries to be connected centers of learning and librarians to be the connectors in connected learning, feedback from teens—whose needs and interests continue to evolve—is crucial to ensure that proper teen programming and services are in place for them. Almost all the questions posed in *The Future of Library Services for and with Teens*^{ix} to guide local assessment and planning can be answered by engaging teens using the cooperative inquiry techniques presented in this paper. Such equal partnership with teens in the design of teen-related services and programs will situate both teen services librarians and teens as equally responsible for the learning that happens in the library.

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Notes

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^{xxiii} *Ibid.*, 8. The connected learning framework is unpacked in detail in the following resources: Connected Learning Research Network, “Connected Learning Research Network,” *Digital Media and Learning Research Hub*, 2016, <http://clrn.dmlhub.net> (accessed April 10, 2016); Ito et al., *Connected Learning*; and Mizuko Ito, Elisabeth Soep, Neta Kligler-Vilenchik, Sangita Shresthova, Liana Gamber-Thompson, and Arely Zimmerman, “Learning Connected Civics: Narratives, Practices, Infrastructures,” *Curriculum Inquiry* 45, no. 1 (2015): 10–29.

^{xxiv} Braun et al., *The Future of Library Services*.

^{xxv} Eliza T. Dresang and Kate McClelland, “*Black and White: A Journey*,” *Horn Book* 71, no. 6 (1995): 704–10; Eliza Dresang, “Radical Change Revisited: Dynamic Digital Age Books for Youth,” *Contemporary Issues in Technology and Teacher Education* 8, no. 3 (2008): 294–304; Sylvia Pantaleo, *Exploring Student Response to Contemporary Picture Books* (Toronto: University of Toronto Press, 2008); Eliza T. Dresang and Kyungwon Koh, “Radical Change Theory, Youth Information Behavior, and School Libraries,” *Library Trends* 58, no. 1 (Summer 2009): 26–50.

^{xxvi} Dresang and Koh, “Radical Change Theory,” 27.

^{xxvii} *Ibid.*

^{xxviii} *Ibid.*

^{xxix} Braun et al., *The Future of Library Services*; IMLS et al., *IMLS Focus*, 2.

^{xxx} Braun et al., *The Future of Library Services*, 23.

^{xxxi} Jerry Alan Fails, Mona Leigh Guha, and Allison Druin, “Methods and Techniques for Involving Children in the Design of New Technology for Children,” *Foundations and Trends in Human-Computer Interaction* 6, no. 2 (2012): 85–166.

^{xxxii} Allison Druin, “The Role of Children in the Technology Design Process,” *Behaviour and Information Technology* 21, no. 1 (2002): 1–25.

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- ^{xxxiii} Fails, Guha, and Druin, “Methods and Techniques for Involving Children,” 107.
- ^{xxxiv} *Ibid.*, 112.
- ^{xxxv} *Ibid.*
- ^{xxxvi} S. Rebecca Kelly, Emanuela Mazzone, Matthew Horton, and Janet C. Read, “Bluebells: A Design Method for Child-Centered Product Development,” in *NordiCHI '06: Proceedings of the 4th Nordic Conference on Human-Computer Interaction: Changing Roles* (Oslo, Norway, October 2006), 361–68.
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- ^{xxxviii} Andrew Large, Leanne Bowler, Jamshid Beheshti, and Valerie Nettet, “Creating Web Portals with Children as Designers: Bonded Design and the Zone of Proximal Development,” *McGill Journal of Education* 42, no. 1 (Winter 2007): 61–82; Andrew Large, Valerie Nettet, Jamshid Beheshti, and Leanne Bowler, “‘Bonded Design’: A Novel Approach to Intergenerational Information Technology Design,” *Library & Information Science Research* 28, no. 1 (Spring 2006): 64–82.
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^{xliii} The bags of stuff technique is explained in detail in the following resources: Druin, “Children as Codesigners of New Technologies”; Fails, Guha, and Druin, “Methods and Techniques for Involving Children”; and Guha, Druin, and Fails, “Cooperative Inquiry Revisited.”

^{xliv} Fails, Guha, and Druin, “Methods and Techniques for Involving Children.”

^{xlv} Allison Druin, “Children as Codesigners of New Technologies: Valuing the Imagination to Transform What Is Possible,” *New Directions for Youth Development* 128 (Winter 2010): 35–43.

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^{lii} Fails, Guha, and Druin, “Methods and Techniques for Involving Children.”

^{liii} The *Mission to Mars* technique is explained in detail in the following resources: Dindler et al., 2005; Dindler & Iverson, 2007; Fails, Guha & Druin, 2012.

^{liv} Ibid., 137–38.

^{lv} The layered elaboration technique is explained in detail in the following resources: Druin, “Children as Codesigners of New Technologies”; Fails, Guha, and Druin, “Methods and Techniques for Involving Children”; Guha, Druin, and Fails, “Cooperative Inquiry Revisited”; Greg Walsh, Allison Druin, Mona Leigh Guha, Elizabeth Foss, Evan Golub, Leshell Hatley, Elizabeth Bonsignore, and Sonia Franckel, “Layered Elaboration: A New Technique for Co-Design with Children,” in *CHI '10: Proceedings on the SIGCHI Conference on Human Factors in Computing System* (Atlanta, Georgia, 2010), 1237–40.

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