

Co-Design with Children: A KidsTeam Toolkit for Librarians

by

Zoe Marie Skinner

December 2020

Presented to the

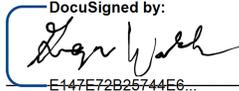
Division of Science, Information Arts, and Technologies

University of Baltimore

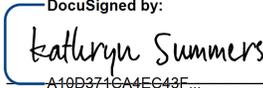
In Partial Fulfillment

of the Requirements for the Degree of

Master of Science

Approved by:  E147E72B25744E6...

[Greg Walsh, Thesis Advisor]

 A10D374CA4EG43F...

[Kathryn Summers, IDIA Program Director]

## Abstract

This exploratory study aims to create a draft of a standalone KidsTeam toolkit (Toolkit v.1) to support public librarians when they plan, implement and facilitate KidsTeam collaborative design (co-design) sessions with their youth patrons in their library branches. My research is rooted in the work of Dr. Allison Druin's research on and formation of KidsTeam, an intergenerational design team in which children and adults co-design technologies for children together, and Dr. Greg Walsh's adaptation of this KidsTeam model for public libraries, specifically, his KidsTeam Project Repository, which is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA). A Research through Design (RtD) approach informed my three-stage research design as I explore the format and function of Toolkit v.1 with a narrow participant pool of 3 public librarians who have past experience co-facilitating KidsTeam co-design sessions in their libraries. Stage 1 explored participants' past experience as co-facilitators and the format for Toolkit v.1. Stage 2 consisted of iteratively analyzing and synthesizing the data from Stage 1 to inform the design artifact (Toolkit v.1). Stage 2's results dictated the research design for Stage 3, in which I conducted a usability assessment and follow-up interviews. From this data analysis, I offer recommendations for Toolkit v.2 and suggested paths for future research.

## Acknowledgments

I'd like to extend my immense gratitude to all my family and friends who have supported me throughout this journey. Thank you for pushing me and for believing in me. Thank you to my parents for all the sacrifices you made to help me get to this point and your support throughout this entire process. Words cannot adequately express how grateful I am. Thank you to my brother for always inspiring me to be my best, encouraging me to continue to push through even the hardest of times and for sending me lots of music to fill my ears while writing. Thank you to my grandmother for always lending a listening ear and encouraging me to take breaks and have fun throughout. Finally, thank you to B for your unwavering support through it all, I couldn't have done it without you.

Thank you to all my professors and fellow IDIA colleagues. I have grown both professionally and personally from each one of you. I am thankful for the diverse perspectives that have challenged my perception of design and its application. They have fostered an even deeper passion within me to promote the power of collaborative design techniques. Thank you to my program director, Dr. Kathryn Summers, for your guidance throughout my time at UB, for instilling in me the importance of universal design and for being my second reader. Finally, I'd especially like to thank my advisor Dr. Greg Walsh for your mentorship and how you leverage your platform and academic scholarship to continually refine the design process to include more voices in the conversation. Thank you for all your support throughout my degree, I am so grateful.

I'd also like to thank all of the CCI and KidsTeam researchers and practitioners that have come before me on whom my research is built. Thank you for believing in the power of children and offering them an opportunity to design their present and future. Finally, thank you to all the librarians and children who have participated in KidsTeam programs in the past, present and future. Your insatiable curiosity and belief in the power of collaborative design has served as an inspiration throughout this entire process. My hope is that this toolkit will continue to be iterated upon and built out to reflect the unique needs of your community. I can't wait to see what you all create.

## Table of Contents

List of Tables .....	iii
List of Figures .....	iv
Chapter 1: Introduction .....	1
Chapter 2: Literature Review .....	6
Background on Collaborative Design .....	6
Child Computer Interaction (CCI) .....	7
Child Cognitive Development Theories and CCI .....	8
Developing Technology for Children vs. Adults .....	10
Developing a KidsTeam Toolkit for Librarians .....	16
Goals of Co-Design with Children .....	16
Shifting Roles of Community Members in Co-Design .....	18
Design Thinking .....	19
Co-Design with Children Toolkits .....	23
Chapter 3: Methodology .....	27
Methods .....	27
Participants .....	28
Data Collection and Analysis .....	28
Chapter 4: Process Documentation .....	31
RtD Process Documentation .....	31
Stage 1: Exploration of Toolkit v.1 Design .....	33
Stage 2: Toolkit v.1 Creation .....	35

Thematic Analysis Informing Toolkit v.1 Elements.....	38
Impact of Toolkit v.1 Design Choices on Stage 3’s Research Design .....	61
Stage 3: Assessment and Evaluation of Toolkit v.1 .....	71
First Impressions of Toolkit v.1 and Content .....	77
The Worksheet and Template Sections.....	80
Distribution Methods .....	80
Chapter 5: Design Artifact Recommendations .....	82
Recommendations for Toolkit v.2 .....	82
Structure.....	82
Content.....	87
Style	91
Distribution Format.....	92
Chapter 6: Conclusion.....	94
Summary of Research.....	94
Limitations .....	95
Plans for Future Research .....	96
Appendix A: Stage 1: Interview Questions .....	108
Appendix B: Access to Greg Walsh’s KidsTeam Project Repository .....	111
Appendix C: Toolkit v.1 Design Artifact .....	112
Appendix D: Stage 3: Usability Assessment Questions .....	131
Appendix E: Stage 3: Post-Assessment Interview Questions.....	133

List of Tables

Table 1. Stage 1 & 2: Thematic Categories and Toolkit v.1 Elements.....	35
Table 2. Walsh’s KidsTeam Project Repository as reflected in Toolkit v.1.....	37
Table 3. Toolkit v.1 and Walsh’s KidsTeam Project Repository elements supported by Theme 1 .....	39
Table 4. Toolkit v.1 and Walsh’s KidsTeam Project Repository elements supported by Theme 2 .....	42
Table 5. Toolkit v.1 and Walsh’s KidsTeam Project Repository elements supported by Theme 3 .....	47
Table 6. Toolkit v.1 and Walsh’s KidsTeam Project Repository elements supported by Theme 4 .....	53
Table 7. Stage 3: Individual Participant Usability Assessment Results .....	72

## List of Figures

Figure 1. Three-stage design process visual .....	32
Figure 2. KidsTeam Process for Multi-Week Program graphic .....	41
Figure 3. Overview of the 5 Phases graphic .....	41
Figure 4. “Planning Your Program Timeline” portion of “Worksheet” .....	45
Figure 5. “Supplies List” .....	51
Figure 6. “Preparing the Design Specific Activities” section of “Worksheet” .....	52
Figure 7. “KidsTeam Goals and Background” .....	55
Figure 8. “Activity Ideas for Phase 3: Design Time” .....	59
Figure 9. “Selecting Your Activities and Questions of the Day” chart .....	60
Figure 10. “Table of Contents” .....	62
Figure 11. “KidsTeam Program Session Template” .....	64
Figure 12. Color coded headers and sub headers.....	67
Figure 13. Toolkit v.1’s high contrast headers and sub headers .....	67
Figure 14. “Worksheet’s” high contrast headers and sub headers.....	68
Figure 15. “5 Phases...” header format .....	69
Figure 16. “Selecting Your Activities and Questions of the Day” .....	74
Figure 17. “Tips” linking to Walsh’s article “Anatomy of a Design Session” .....	76

## Chapter 1: Introduction

In the field of Child Computer Interaction (CCI), collaborative or “co-design” is a research method in which children and adults collaboratively design technologies and experiences together in the pursuit of child-centered products or services. It has its roots in the Scandinavian Participatory Design (PD) principles around participation of adult end users in the development of workplace tasks (Kyng, 1991). A necessary adaptation in methodology and technique was made by Dr. Allison Druin when design partners shifted designing for adults to children end users (Druin, 1999). Through decades of research, their seminal work on the development and implementation of the Cooperative Inquiry method (Guha et al., 2013) became the foundation for the CCI community’s approach to designing technology with children. An adaptation of Karen Holtzblatt and Hugh Beyer’s Contextual Inquiry (Holtzblatt & Beyer, 2017), Cooperative Inquiry recognizes that children are not just “tiny adults” and that their expertise in their own experience is not only beneficial to but crucial in the development of technologies for children (Druin, 1999). While Cooperative Inquiry positions children as design partners, children’s role in the design process can range from users to testers to informants depending on the goal of the research and the stage of the design process (Hourcade, 2015, pp. 38–41).

While a core goal of CCI broadly, and co-design with children specifically, is to design child-centric products, another major goal centers around the impact the design process has on the child co-designer’s personal development (Hourcade, 2015, p. 1). It is posited that by involving children in the co-design process as equal design partners with adults, this experience fosters creativity, a sense of autonomy, problem-solving and learning in the child co-designers (*Design Process*, n.d.; Hourcade, 2015; Iversen et al., 2017; Iversen & Brodersen, 2008) and further that these methods and techniques must continue to adapt to reflect that goal. One adaptation has come in the form of how each design session is created, with special attention to the selection of techniques used in order to meet a particular design goal (Walsh et al., 2013).

However, through their decade of work with KidsTeam, the manifestation of Druin's Cooperative Inquiry method in which an intergenerational design team of academic university partners, external partners and children meet over the course of a year, designing technology experiences for children (Walsh, 2011), Greg Walsh posits that the traditional KidsTeam model is unintentionally restrictive in nature, leaving certain populations, specifically those in urban areas, out of the design process (Walsh, 2018). Through their work in public libraries in Baltimore, they found that the time commitment (consistent participation over the course of a academic year) and location (academic research lab) put a strain on participation of children in lower income areas (Walsh, 2018). With a core tenet of CCI being to design positive interactive technologies for children that will aid their personal development (Hourcade, 2015, p. 5), we must be cognizant of and design our research to help mitigate the inequities in access to such technologies as is illuminated by the increasing digital divide between socioeconomic classes in the United States (Anderson & Kumar, 2019).

When thinking about how we can apply the KidsTeam co-design technique to the public library setting and engage and empower librarians to implement these techniques on their own, we can find support in public libraries' current research initiatives. In their most recent strategic research agenda, the American Library Association Library Service to Children (ALSC) highlighted six priority research areas of focus (*ALSC National Research Agenda for Library Service to Children (Ages 0-14)*, 2019), four of which are in line with the goals of introducing co-designing with children into public libraries. They are: (1) Learning and Development for School-Age Children; (2) Diversity, Equity and Inclusion with Children and Families; (3) Media Mentorship and Technology Use; and (4) Professional Development of Library Staff to Serve Children and Family (*ALSC National Research Agenda for Library Service to Children (Ages 0-14)*, 2019). We see a natural intersection here between public libraries and co-design with children as the goals of both hover around providing opportunities and the physical space for children to learn, play and grow. The ALSC's second strategic research goal of *Diversity, Equity and*

*Inclusion with Children and Families* is especially pertinent for this research as there has been a move in the field of co-design with children and the broader field of PD to critically assess and adjust methodologies and techniques to actively and intentionally design with and for diversity, equity and inclusion (Harrington et al., 2019; Walsh, 2018).

This leads me to believe that libraries could become natural spaces to conduct co-design sessions. We see that public libraries continue to acknowledge the need to better understand their youngest patrons (aged 0-14) and how they can best serve them. As libraries continue to adapt to 21<sup>st</sup> century needs, we've seen a shift in programming and service design towards a more human-centered approach. The *Library of the Future*, an initiative of the American Library Association (ALA) recently named “design thinking” one of the trends in libraries and librarianship (Figueroa, 2018). Design thinking’s iterative process and system of divergently and convergently thinking rooted in empathetic and user-centered research methods is appealing to libraries as it has the potential to “align with [their] broad mission to help individuals be curious, intuitive, recognize patterns, construct ideas, and express themselves” (Figueroa, 2018).

In the Design community, we've seen a recognition of public libraries as spaces conducive to design thinking techniques. The global design firm IDEO in partnership with the DOKK1 Public Library in Aarhus, Denmark and the Chicago Public Library in the United States with funding from the Bill & Melinda Gates Foundation created the Design Thinking for Libraries Toolkit which provides both a framework and step-by-step guide of implementing design thinking tools and techniques into libraries (*About — Design Thinking for Libraries*, n.d.). However, this toolkit is a general guide for how to utilize the design thinking methodology and technique in the library setting. Most of these techniques are positioned as ways to engage adult library patrons, not children. Just as a refinement to PD was necessary in order to design with and for youth populations, a toolkit intended for designing with and for young library patrons must also reflect those refinements. Walsh has explored this with his KidsTeam Project Repository, which he positions as a “a collection of resources for those that want to run their own

intergenerational design teams” (Walsh, 2018/2020). In the repository, he makes a call for others to use the repository, which falls under the Creative Commons Attribution-ShareAlike 4.0 International License.

Combining these calls for research in the public library community and CCI community, along with Druin and her team’s development of the Cooperative Inquiry method (Guha et al., 2013), in which children and adults actively co-design technology and experiences for and with children, I aim to explore what resources we can give public librarians to empower them to plan, implement and facilitate co-design sessions in their library branches directly with their youth patrons. For this, I further ground my research in Walsh’s work adapting Druin’s Cooperative Inquiry method to shorter co-design sessions with children in the urban public library setting (Walsh, 2018) and, specifically, his KidsTeam Project Repository (Walsh, 2018/2020). Out of this past research, I formulated two research questions to guide my research design and methodology:

- (1) What does the first draft of a standalone KidsTeam toolkit (Toolkit v.1) look like for librarians working in public libraries?
- (2) What do librarians need when conducting and facilitating KidsTeam co-design sessions with their youth patrons without academic research staff present?

In order to explore these questions and better understand the aspects needed for Toolkit v.1, I chose a narrow target population of librarians from a public library system in Maryland who have first-hand experience co-facilitating Walsh’s modified KidsTeam model in their branches alongside academic researchers. I use a Research Through Design (RtD) approach in which the toolkit prototype is refined throughout the research stages based on participant feedback and task analysis and directly informs the evaluative research stage. The structure of this paper also reflects this methodology. Bardzell et al.’s research findings around the key qualities of RtD “process documentation” informed my choice to create Chapter 4: Process Documentation (Bardzell et al., 2016).

I conducted three stages of research, each one’s data analysis impacting the design artifact of the next. In Stage 1, I conducted individual interviews with each

## [Co-Design with Children: A KidsTeam Toolkit for Librarians: Introduction]

5

librarian. Based on their feedback in conjunction with past research, I moved into Stage 2 in which I created the first draft of a standalone toolkit, Toolkit v.1, based off of the data from Stage 1 in conjunction with the KidsTeam Project Repository (Walsh, 2018/2020). Stage 3 began about four weeks later, where I had each participant evaluate the Toolkit v.1 design artifact through a usability assessment and open-ended interview questions. Finally, based on analysis of individual usability assessment results and interview responses, I offer recommendations for Toolkit v.2 and suggestions for future evaluation.

My research questions and methodology are rooted in grounded theory on co-design with children, primarily building off of the seminal works of Druin and Walsh, specifically their development and refinement of the KidsTeam model to include more diverse and representative voices in the design process. This research is exploratory in nature as I look to gain more insight into what a standalone KidsTeam toolkit could look like for public librarians as well as how such a toolkit can empower and offer confidence when librarians plan, implement and facilitate co-design sessions with their youth patrons.

## Chapter 2: Literature Review

### **Background on Collaborative Design**

To gain a better understanding of how we might best design a toolkit for Librarians to use when facilitating collaborative design sessions with children, it behooves us to go back to how the current methods of collaborative design evolved. Collaborative design or co-design, in which users of technology and the designers cooperatively work together throughout the design process in pursuit of designing a new product, technology, or system, has its roots in the Scandinavian cooperative design principles in the work environment. Throughout the 1960s - 1980s, researchers in Scandinavia were exploring ways in which workers could increase their influence in workplace technologies (Bødker et al., 1995). In the 1980s, research honed its focus not only on how technology can aid in workers' collaboration but, also how techniques in which designers actively and intentionally included all users in the design process can yield a better user experience (Bødker et al., 1995). Specifically, the Utopia Project (1981 - 1985) in which researchers collaboratively worked with typographers in a workers union to develop both skill training for the workers and ways that the computer system could better enhance the quality of their products (Bødker et al., 1995). This project is seen as the jumping off point for collaborative work and research methodologies, including in the field of Child Computer Interaction (CCI) (Iversen & Dindler, 2013). After reflecting on the project, the researchers recognized the limitations of the method to foster one of the goals of cooperative design: "mutual learning" (Kyng, 1991). To truly be cooperative design in which both ends of the design process are working together, there needs to be a conscious shift in perspectives to include both designers and end users, with both parties actively learning and contributing their view points in the final design (Kyng, 1991, pp. 69–70).

As the Scandinavian approach was being developed and further refined for the larger field of cooperative work beyond trade unions, this collaborative design movement

was simultaneously taking shape in America. Critics of the Scandinavian approach's transferability to American society felt that refinement to the principles and approach were necessary as it was believed that part of the Scandinavian methodology's success was inextricably linked to their socio-political environment such as their strong trade unions and social welfare system (Grudin, 1994; Muller et al., 1991) which varied greatly from America's. However, during the 1980s, there was still much interest in the field of computer science on how to expand their current understandings of workplace technology (i.e. "office automation") to reflect the rise of single-user applications and interfaces (Grudin, 1994). What started out as a "meeting of the minds," turned into an interdisciplinary approach to addressing the challenges and opportunities of using developing technologies to foster collaborative working environments (Grudin, 1994). Known as Computer Supported Collaborative Work (CSCW), coined by Irene Greif of MIT and Paul Cashman of Digital Equipment Corporation, this approach led to the development of what became known as "groupware," technologies specifically designed to aid in collaborative work (Ellis et al., 1991).

It is out of these technologies that we begin to see the evolution of both the method in which new technologies are designed for collaboration and the technologies themselves. The Scandinavian approach of collaboratively designing for work with adults influenced the development of current co-design and participatory design (PD) methodologies that are utilized in the field of CCI.

### **Child Computer Interaction (CCI)**

CCI grew out of the broader field of Human Computer Interaction (HCI) as studies with children around education and technology sparked an interest in children as budding technology users and in how designing for children may differ from designing for adults (J. C. Read & Bekker, 2011). In a quest for justification of and a clearer direction for research, researchers made the distinction between CCI and HCI in a couple of ways. The most obvious differentiating factor is the age range for this discipline and the way age impacts how and through what means children can participate in the design

process. CCI focuses mainly on children roughly aged 5-11 years old, a distinct period of cognitive development that psychologists continue to theorize about. Much of the co-design CCI methodologies are rooted in these theories around how children in this age group think, learn and develop. CCI researchers framed their work around the theories of pioneers in the field of psychology such as Jean Piaget, Erik Erikson and Lev Vygotsky and later those in computer science such as Seymour Papert (Hourcade, 2015). I'll briefly discuss their theories in the context of how they can be applied to co-design methodologies and techniques in CCI.

### **Child Cognitive Development Theories and CCI**

Although recent research meets his work with skepticism, Jean Piaget's work in the mid-late-20<sup>th</sup> century laid the groundwork for understanding and accepting the belief that a child's cognitive development happens in incremental stages and that children learn by constructing knowledge through their experience with the world (Hourcade, 2015). His distinct stages of development have helped those in the field of interactive product design for children frame their techniques based on the belief that children in the Intuitive Thought Stage (age 4-7) can utilize words and symbols but have difficulty thinking logically, unlike those in the Concrete Operations Stage (age 7-11) (Markopoulos et al., 2008, p. 8-9). The computer scientist and educator Seymour Papert expanded upon Piaget's constructivist approach, specifically in his and Idit Harel's work in the late 1960s-1980s developing *Logo*, the children's programming language tool, claiming that children construct learning best "in a context where the learner is consciously engaged in constructing a public entity, whether it's a sandcastle on the beach or a theory of the universe" (Papert & Harel, 2002). Others built on Papert's constructionism theory, applying it to groups of individuals designing and learning together. Distributed constructionism (Resnick, 1996) claims that knowledge forms and grows "...through collaborative activities that involve not just the exchange of information but the design and construction of meaningful artifacts" (Resnick, 1996, p. 281). These theories can help us not only when thinking about what techniques and methods to use for co-design with

children, but also how such techniques and methods may have added benefits for a child's learning.

This expansion of Piaget's theory to include both context and social interactions is in line with other critiques of his work which claim that his theory doesn't take into consideration the socio-cultural aspects of learning. Since Piaget, psychologists have recognized context and social interactions as critical aspects of understanding how children learn. Erik Erikson's psychodynamic stages begin to fill in those gaps, outlining the challenges unique to each stage of development, specifically the Industry versus Inferiority stage (age 6-13) in which children have learned to use their own initiative, but are developing the ability to follow rules and work alongside peers (Eccles, 1999; Markopoulos et al., 2008, p. 6). This insight is imperative when considering how to facilitate children working with others their age or those significantly older such as on intergenerational design teams (Druin, 2005). I'll be exploring this aspect further in later sections in the context of creating equal partnerships between children and adults in co-design sessions.

Markopoulos et al.'s work presents other perspectives to take into consideration when collaboratively designing technology for and with children, using such sociocultural theorists as Urie Bronfenbrenner and Lev Vygotsky. Unlike Erikson and Piaget, Bronfenbrenner's work aimed to further contextualize childhood development. Rather than distinct stages, he theorized that children are simultaneously influenced by and influence their immediate environment, social context and cultural context (Markopoulos et al., 2008). The authors believe that Bronfenbrenner's theories usefully expand upon those of Vygotsky, in which Vygotsky observed that signs, language and tools are critical for cognitive development (Hourcade, 2015; Markopoulos et al., 2008). While there continues to be debate in the field around how children learn and how their cognition develops, we can use these theories as guideposts when developing co-design methodologies and techniques for designing technology with and for children.

### **Developing Technology for Children vs. Adults**

These theories help us better understand childhood development in the context of the interactions between children, places and technology. Others further differentiate CCI from HCI by looking at how children's and adults' technological experiences are different. Researchers assert that the way children and adults interact with technology differ in three distinct ways: the activities they use technology for, how they behave around technology and their overall concerns about technology (J. C. Read & Bekker, 2011). We can further understand these differences through the theory of situativity as it "focuses attention on systems in which people interact with each other and with material, informational and conceptual resources in their environments" (Greeno, 1998). This theory has its roots in ethnography, a form of anthropological research in which researchers observe people in their natural setting to glean more information about their habits and experiences (The Editors of Encyclopaedia Britannica, 2019). The field of HCI and, specifically, user-research, adopted and refined this technique of data collection and analysis, developing what is now known as *contextual inquiry* (Holtzblatt & Beyer, 2017). Through their decades of research and implementation, Holtzblatt and Beyer position this technique as "driven by the realization that a product is always part of a larger practice, used in the context of other tools and manual processes to deliver value to the user's overall life and work" (Holtzblatt & Beyer, 2017, p. 8). However, when put into the context of co-design, contextual inquiry is only a piece of the puzzle, as the technique calls for researchers to immerse themselves in the lives of the people they are studying (Holtzblatt & Beyer, 2017) but, those individuals being studied are not themselves designing a new system or product for their lives.

#### **Cooperative Inquiry and Children as Design Partners**

Recognizing the potential of contextual inquiry to help researchers better understand the user in context of their work, those in the field of CCI and co-design refined Holtzblatt and Beyer's technique to not only meet the unique needs of children, but also to expand the definition of *how* children can participate in the design process. A

prime example of this is Dr. Allison Druin and her team's seminal work with intergenerational design teams across her career (for a partial history of her research team's work see (Guha et al., 2013)). Her research team approached their work with children through the vantage point that children uniquely experience the world and that designers and researchers need to both acknowledge their biases when approaching co-design with children and create methodologies as best they can to mitigate those biases from influencing their designs (Druin, 2002). The way we can achieve this, she claims, is by incorporating children into the design process beyond the role as *testers*, which is the most common role that children have played in the design process, and into *design partners* (Druin, 2002). As partners in the design process, children and adults become equal stakeholders in the design of new technology (Hourcade, 2015).

To achieve this true partnership between adults and children in the design process, Druin advocates for a method called *cooperative inquiry* which is part contextual inquiry, part PD and part technology immersion (*Design Process*, n.d.; Druin, 1999; Guha et al., 2013). The main difference between this method and the ones she and her team pulls from is that cooperative inquiry intentionally incorporates techniques that foster collaboration between children and adults, with techniques reflecting the unique needs of both populations (Guha et al., 2013). These techniques aim to mitigate challenges that may impact the design session such as traditional power dynamics between children and adults (think: teacher/student, child/parent, researcher/participant, etc.). Druin found that these traditional roles can be broken down and trust built between participants when three critical aspects of the co-design approach are achieved: (1) multidisciplinary partnership with children, (2) field research emphasizing understanding the context of the user's environment and (3) iterative and low-tech prototyping (Druin, 1999).

### ***KidsTeam***

Through their work at the University of Maryland, College Park's Human-Computer Interaction Lab (UMD HCIL), Druin and her colleagues developed an intergenerational co-design team known as *KidsTeam*, which uses cooperative inquiry to

develop new technologies for and with children and to better assess and evaluate this technique (*KidsTeam*, n.d.; Knudtzon et al., 2003; Walsh, 2013). The KidsTeam model can be used at various stages of the design process of new technology, with each individual design session broken up into four distinct phases: snack time, circle time, design time and big ideas (Walsh, 2013). The sequence of these phases helps to both establish a rapport between children and adults, build trust and create clear separation between socializing and designing (Walsh, 2013). Since its creation, several other universities have adopted KidsTeam groups, some examples include: Boise State University (*Jerry Alan Fails - Boise State University, Human-Computer Interaction Lab*, n.d.), University of Baltimore (*Kidsteam UB*, n.d.) and University of Washington (*KidsTeam UW*, n.d.).

### **Designing for Equal Partnership between Children and Adults**

#### ***Number of Design Sessions***

When facilitating in-person co-design sessions with children, it is important to consider the elements that are attributed to helping develop an equal partnership between children and adults. Beyond the individual stages of the design process, the number of design sessions is also critical to the technique's success in establishing children as design partners within the co-design sessions. Druin and the UMD HCIL research team found that it takes close to 6 months of bi-weekly meetings for partnerships between intergenerational design partners to blossom (Druin, 2002). As the method continues to be refined, others who have adopted this approach found the time commitment can be limiting in terms of participant recruitment (Walsh, 2018; Walsh et al., 2012). In attempts to refine this method, we've seen these researchers and others work with public libraries for shorter periods of time in attempts to include more children in the design process (*KidsTeam Libraries*, n.d.; Walsh, 2018). Instead of working with a group of children for 6+ months working on several projects in the university lab setting, Walsh's modified method consisted of four to five once-a-week design sessions hosted in urban public libraries, focused on solving one specific problem, with each week centered around a

distinct stage of the design thinking process (Walsh, 2018). Out of his work he created a KidsTeam project repository for others to use when hosting intergenerational design teams on their own (Walsh, 2018/2020). It is this work that inspired this current research's exploration of further developing a standalone KidsTeam toolkit specific for public librarians. I'll be exploring the implications of his work in the context of equitable co-design sessions later on.

### ***Adult's Role in the Design Process***

While amount of time is just one factor in establishing trust and partnership between adults and children, others believe there is need for more evaluation of adult's role in the co-design process as we strive for equitable partnerships within the co-design process. Recently, researchers in the field have taken a critical eye to evaluating the role that adults play in intergenerational design sessions and how we can evaluate their participation and influence in order to foster equal partnerships between children and adults in co-design and PD sessions. Jason Yip and his team at the University of Washington have sought to do just that, looking to further define what a true "equal partnership" between children and adults looks like during these design sessions (Yip et al., 2017). They mirrored Druin's framework of children's role in the design process (Druin, 2002) with the complementary role for adults, coupled with the level and type of interaction with children that is necessary for each role (Yip et al., 2017). Through case studies, they uncovered "four dimensions of adult-child interactions: *facilitation, relationship building, design-by-doing, and elaboration*" for in-person co-design sessions (Yip et al., 2017, p. 5746), which rest on a balance scale between equal-unequal child-adult collaboration, based off of Read et al.'s Informant, Balanced, Facilitated Design (IBF) model (J. Read et al., 2002).

The IBF model places child-adult interactions in PD on a spectrum, where at one end the child contributes through informant design – the child's role is mainly to inform adult designers about their preferences – and at the opposite end there is facilitated design – the child is responsible for conceptualizing and actualizing the designs (J. Read et al.,

2002). They acknowledge that this is a continuum and there are four variables which help determine where individuals fall on that spectrum: environment, knowledge, skills and security (J. Read et al., 2002). While all of these variables are important to consider, environment is an obvious one that requires special attention in regard to facilitating collaboration and fostering equity between design participants during co-design sessions with children.

### *Design Session Environment*

Others in the field of CCI that utilize the cooperative inquiry method with children also recognize the importance of environment in helping to facilitate collaboration between intergenerational design team members. We find a popular choice for co-design of this kind is either in the academic lab or school setting (Hourcade, 2015 p.43-44). In Knudtzon et al.'s case study, they outline 10 lessons learned from starting an intergenerational design team, with number nine being, "The working environment of the team needs to be conducive to collaborative design" (Knudtzon et al., 2003). They recommend that the space be "kid-friendly," allowing for participants to sit on the floor in smaller groups to facilitate collaboration (Knudtzon et al., 2003). However, they themselves recognized that the lab setting set up made it difficult at times to achieve that goal (Knudtzon et al., 2003). Whereas the school environment, although designed for children, comes with inherent and "well-established power imbalances...that often prevent children from challenging adults' ideas and working with them as equals" (Hourcade, 2015, p. 43). As referenced above, J. Read et al. found similar results, with those pre-established power dynamics between child and adults impacting the ability for them to participate and contribute as equal design partners (J. Read et al., 2002).

This research is in line with others in the field who have found the environment of the co-design sessions to have an impact not only on child-adult interactions during the design session, but also on access to the design sessions themselves (Walsh, 2018). Referring back to his work in urban public libraries, Walsh assessed Druin's cooperative inquiry method in regard to child participation. He posits that the traditional time

commitment (i.e. multiple sessions per week over the course of 1-2 years) and hosting the design sessions in the academic lab setting unintentionally restrict child participation, skewing participants towards the more affluent (Walsh, 2018). Through a 4-year case study, he analyzed two types of co-design sessions with children in attempts to include more diverse voices in the design process ((1) Using Druin's traditional Cooperative Inquiry method but limiting participants to Baltimore City residents only; or (2) Once-a-week design teams in urban public libraries). Out of his findings, he suggests that "more inclusionary co-design can occur when we limit the amount of time required from our participants and go meet them in their neighborhood" (Walsh, 2018). Another example of a similar approach is the work of KidsTeam UW (University of Washington) and their partnerships with Seattle Public Libraries and rural libraries (*KidsTeam Libraries*, n.d.). In addition to their university research-lab based KidsTeam, they created KidsTeam libraries which "give[s] kids in different communities the opportunity to be design partners" (*KidsTeam Libraries*, n.d.).

### ***Co-Design Techniques***

Similar conversations around shifts in methodology and techniques in order to intentionally design from a place of equity and inclusion are also happening in the larger HCI and PD field. Through their extensive work and study of Community Based PD (CBPD), Harrington et al. critically assessed CBPD's overall "approach to democratizing innovation in the design process by shifting the power dynamics between researcher and participant," noting that the environment and location of our design engagements can actually solidify preexisting and historical tensions between the research community and/or institution and community members (Harrington et al., 2019). They suggest that some "preparatory activities" can help the researchers better understand and design the sessions to reflect the needs of the community and for histories and goals of the community members recognized from the beginning (Harrington et al., 2019).

Beyond the location and overall environment, the researchers make the claim that the design workshop itself "is a socially and culturally constructed practice that brings

with its expectations that may further marginalize and ultimately undermine participation of certain individuals” (Harrington et al., 2019). Through their work, they found that utilizing storytelling to facilitate community members voicing their personal narratives revealed a more holistic understanding of the design problem at hand, which “help[ed] humanize a community beyond disparities and negative perceptions” (Harrington, 2020). And while their CBPD work focuses on designing community health solutions for and with underserved populations, mainly through in-person workshops, this shift in thinking is important to consider when striving to conduct more equitable and inclusive co-design sessions within any community. It behooves us to take both of these equity perspectives (location/environment and techniques used in the co-design sessions) into consideration when investigating co-design procedures and methods that will actively and equitably include more voices into the design process.

### **Developing a KidsTeam Toolkit for Librarians**

#### **Goals of Co-Design with Children**

When considering the further development and application of a standalone KidsTeam toolkit for librarians, it’s important to look at what the current goals of co-design sessions with children are, and how they may expand beyond the tangible outcomes of designing more human-centered products and experiences. Referring back to KidsTeam, a critical goal of working with children as design partners through this process is “to develop technologies that will help them be creative, have fun, explore, learn and communicate” (*Design Process*, n.d.). So, it appears that part of the goal of the design process is to serve as an opportunity for the child participants to learn and grow as individuals. Others in the field have taken a similar view that the goal of co-design or PD sessions with children extends beyond the quality and usability of the product itself. Iversen et al. makes the claim that the child’s role in PD sessions is as a “protagonist,” one who is both empowered through the design process and subsequently develops 21<sup>st</sup> century skills via the technology they create (Iversen et al., 2017). The child as a protagonist is yet another role that children can play through the design process. The role

of protagonist is different than the spectrum of roles mentioned earlier (tester through design partner (Druin, 2002), informant through facilitator (J. Read et al., 2002; Yip et al., 2017) or van Doorn's discussion of children as co-researchers that Iversen et al. reference (van Doorn, 2016)). Iversen et al.'s proposal that the child be seen as a "protagonist" has roots in political PD; they claim that the "objective of design is not only technological products, but for participants to develop new insights, design abilities, and a critical and reflective stance toward technology through their engagement in design work" (Iversen et al., 2017). If this participant growth is part of the goal, the measurement outcomes shift to not only usability of the product, but also a need to "look at the extent to which children have developed insights into the nature of digital technology as well as enhancing their design competence and their ability to reflect on the role of technology in their lives" (Iversen et al., 2017).

### **Constructionist Theory**

We've seen traces of this viewpoint in the early development of designing technology for and with children in the fields of computer science and education. Referring back to the constructionist theory around learning, we can learn from those in the field whose research focused on how the goal of a child's role in the development of technology was not just to develop a usable and enjoyable product, but also to provide direct educational benefits to those child co-designers. As briefly mentioned earlier, we see this exemplified through the work of Papert and Harel, specifically with their development *Logo* and *Scratch*, and the resulting pedagogical philosophy of constructionism (Logo Computer Systems Inc, 1999). Through their work, they claim that building and constructing rather than *instructing* as a means of teaching children not only helps children learn but "fosters situations which the teacher has never seen before and so has to join the students as an authentic co-learner" (Logo Computer Systems Inc, 1999). While they acknowledge that constructionism isn't the only way children learn and may not be the best for everyone, their teachings can help us when investigating the intended goal and impact of co-design with children.

The philosophy behind co-design with children in which children are design partners (Guha et al., 2005), or protagonists (Iversen et al., 2017), falls more in line with constructionist than instructionist perspectives. CCI research recognizes the influence Papert's constructionist theory has had on the field. He and his fellow researchers place great "emphasis on providing children with technologies with which they get to be authors, rather than experience worlds and situations that are pre-scripted, or absorbing facts provided by a computer" (Hourcade, 2015, p. 9). To further situate this philosophy across what and how researchers design with children, ten pillars of child-computer interaction were created. Two of the ten pillars - 2. *Deeply engage with stakeholders* and 8. *Support creativity* - particularly support this constructionist viewpoint. The first recognizes that children of each generation have their own experiences and viewpoints, thus making it essential to engage with them throughout the design process as co-creators (Hourcade, 2015, p. 2). The second pillar (the 8<sup>th</sup> pillar out of ten) directly addresses the claim that the field of CCI is interested in more than just designing impactful technologies. They are just as interested in utilizing the process of design to support learning and creativity, which can be motivational through building and constructing (Hourcade, 2015, p. 4).

### **Shifting Roles of Community Members in Co-Design**

These pillars go hand-in-hand when considering what role public librarians and libraries can play in the co-design process and how academic researchers can empower them to lead these sessions with their youth patrons. Historically, intergenerational design teams have primarily focused on engaging youth stakeholders in the co-design process alongside academic researchers along the spectrum from users, to testers, to design partners (Hourcade, 2015, pp. 38–45), as we've seen through earlier examples in this discussion. And while there is a need for adult stakeholders (i.e. teachers, parents, etc.) to also actively engage in all aspects of the design process, specifically as facilitators (Hourcade, 2015, p. 44), those in the broader field of PD believe there is an opportunity to move from engagement to empowerment, providing the tools and process to children

and adults as direct stakeholders, so they might co-design within their communities contexts without academic researchers. Referring back to Harrington’s work in CBPD, she’s made a recent call in support of transferring the designer role from researcher to community member: “there is an opportunity to look at how we might structure design as a resource to support communities mobilizing amongst themselves without research presence” (Harrington, 2020).

Combining the engagement and empowerment of stakeholders in the design process with the 8<sup>th</sup> pillar of CCI – *Support creativity* –which centers on the belief that children are more likely to learn when they are creating and building (Hourcade, 2015, p. 3), we see even more support for Walsh’s modified KidsTeam approach with librarians and their youth patrons. Walsh’s approach structures sessions loosely around the design thinking process (Walsh, 2018). Depending on the design challenge for that day, the design session can focus on one of the key aspects of the design thinking process: generating new ideas; iterating on existing ideas; or evaluating prototyped ideas (Walsh, 2018/2020).

## **Design Thinking**

### **Brief History**

Design thinking is a human-centered problem-solving methodology and philosophy. The term has been attributed to the global design firm IDEO in the late 1990s, but they acknowledge that the roots of design thinking stem further back, borrowing from others across fields and disciplines whose methods are human-centered (*History*, n.d.). Others in the design community agree with the field’s complex history (Gibbons, 2016), some citing Herbert A. Simon’s 1969 book, *The Sciences of the Artificial* as the first appearance of the term (*What Is Design Thinking?*, n.d.). While there is no single agreed-upon definition – which has brought about criticism (Lahey, 2017) - broadly speaking, the methodology uses divergent and convergent thinking techniques to iteratively inspire, ideate and implement solutions (*IDEO Design Thinking*, n.d.).

Another leader in the field, the Hasso Plattner Institute of Design at Stanford (d.school), breaks the iterative problem-solving method down into 5 distinct stages: “Empathising, Defining, Ideating, Prototyping and Testing” (Dam & Siang, n.d.). Others in the field find design thinking more dynamic in nature, taking on three distinct forms: (1) a mindset; (2) a process; or (3) a toolbox (Brenner et al., 2016).

Part of the definition’s and process’s ambiguity stems from the fact that design thinking is not a traditional linear problem-solving technique. It’s been described instead as “a system of overlapping spaces rather than a sequence of orderly events” (Brown & Wyatt, 2010). A popularized way of visualizing these spaces is the Design Council’s Double Diamond (*What Is the Framework for Innovation?*, 2015). Their process, similar to IDEO’s, focuses on four non-linear stages of design in which designers when faced with a challenge, divergently and convergently think and act as they: Discover (divergent), Define (convergent), Develop (divergent) and Deliver (convergent) to reach a final outcome (*What Is the Framework for Innovation?*, 2015). Researchers believe from a neurological standpoint, that the act of divergent thinking – defocused attention – and convergent thinking – focused attention – helps facilitate more creativity (Goldschmidt, 2016).

### **Criticism of Design Thinking**

Additionally, while design thinking supporters boast of its creative thinking and human-centered approach, there is budding criticism of this approach, ranging from claims that it “dumbs down” a pre-established problem solving methodology to the belief that the process inherently furthers the ideas of those in privileged positions of power (Iskander, 2018). On the latter point, critics are specifically troubled by design thinking’s apparent lack of “rigorous attention to positionality...[which] signals that the designer, as creative visionary, is somehow suspended above the fray of bias, blind spots and political pressure” (Iskander, 2018). This concern is similar to those in the field of co-design and participatory design with children who are concerned about power dynamics between adult and children co-facilitators (see: (Druin, 1999; J. Read et al., 2002)).

Some PD practitioners have created whole new approaches to address these power dynamics. Created “in support of the Uprising in Ferguson” (*About*, n.d.) after the killing of Michael Brown, Creative Reaction Lab developed the Equity-Centered Community Design (ECCD) framework and approach, which is “based on equity, humility-building, integrating history and healing practices, addressing power dynamics, and co-creating with the community” (*Our Approach*, n.d.). With that, their goal is to “educate, train, and challenge Black and Latinx youth to become leaders designing healthy and racially equitable communities” (*About*, n.d.) and have designer’s challenge their understanding of their role in the design process. They make a call for a movement towards “Redesigners for Justice,” proposing that depending on the context, one may identify as an “Equity Designer” – someone who amongst other qualities “[has] lived experiences with the inequity being addressed” – or a “Design Ally” – someone who “leverage[s] their power and access to benefit Equity Designers” (Creative Reaction Lab, 2019). Harrington’s work in CBPD, mentioned earlier, also emphasizes incorporating elements of history and healing to reduce unequal power dynamics between community members and the researchers and designers working alongside them (Harrington et al., 2019).

As we look to integrate the co-design process and elements of design thinking into libraries as a means of creating a more equitable design process, it is essential that we continue to take a critical eye to how both the environment of design sessions and pre-established design processes can, albeit unintentional, further inequities between co-designers.

### **Design Thinking in Libraries**

In light of this criticism, Libraries as institutions are beginning to explore how they might utilize design thinking as a means for creating user-centered services and experiences. The Center for the Future of Libraries, an initiative of the American Library Association (ALA), which works to both “identify emerging trends relevant to libraries and the communities they serve” as well as “promote futuring and innovation techniques

to help librarians and library professionals shape their future” (Figueroa, 2014), recognized *design thinking* as a methodology libraries should embrace as a means of “improving library services” (Figueroa, 2018). Specifically, they mention that design thinking’s user-centered ethos has the potential to benefit both external customers – patrons and community members – as well as internal customers – library staff and professionals. Just as those in the field of CCI prioritize “child-centered design” (Hourcade, 2015, p. 2), the ALA also finds this approach can “help libraries discover authentic and positive ways to address issues of equity and diversity” and by curating a space for design thinking, this problem-solving methodology “could help library professionals become more respectful of diverse perspectives and ways of thinking” (Figueroa, 2018). This is in line with one of the core tenets of the design thinking philosophy: its ability to engage and empower non-traditional designers to utilize and apply designer’s tools and methods to whatever context they are in (*IDEO Design Thinking*, n.d.). Some in the field of library science feel that design thinking’s toolbox of techniques offers an opportunity for library staff to create more positive experiences for their customers, but they also believe that they should be skeptical of applying the process to every problem that arises (Bell, 2018).

### **Design Thinking in Libraries Toolkits**

Recognizing the potential for libraries to utilize the design thinking methodology, IDEO in conjunction with DOKK1 public library in Aarhus, Denmark, and the Chicago Public Library, with funding from the Bill & Melinda Gates Foundation, created the Design Thinking for Libraries toolkit (*About — Design Thinking for Libraries*, n.d.). Their call to action was that as complex spaces with ever-changing needs and constraints, libraries and library staff would benefit from design thinking’s human-centered approach that puts their patrons’ and community needs at the heart of their problem-solving approaches. And while design thinking traditionally has been utilized in the private sector, they see the value for libraries lies in both the immediate impact that solutions and insights uncovered from design-thinking sessions will have on patrons and in the ripple

effects such insights can send across the organization (*Design Thinking for Libraries Toolkit*, 2015, p. 15). The toolkit is the result of observations and analysis of 40 libraries in 10 countries that utilized design thinking with their patrons (*About — Design Thinking for Libraries*, n.d.). Other libraries have utilized the method in a myriad of ways from “creat[ing] collaborative service models” for their branches (Chase, 2017) to transforming the public library’s physical space into an “Innovation Space” (Lee, 2018). One of the original library partners in the project, DOKK1 in Aarhus, Denmark, continues to use the toolkit in a variety of ways, claiming the methodology has “become part of the DNA of [their] library culture...see[ing] all [their] libraries in Aarhus as ongoing prototypes” (Bech-Petersen, 2020). In addition to public libraries seeking the benefits of design thinking’s methodology, those in academic libraries also advocate for the value of this process combined with rapid prototyping (Meier & Miller, 2016).

### **Co-Design with Children Toolkits**

#### **KidsTeam Project Repository**

While the Design Thinking for Libraries toolkit puts users at the center of the design process, it is designed for librarians and library staff to conduct the bulk of the research, activity design, analysis and synthesis. This is one way in which the traditional design thinking process is at odds with the methods and goals of children as co-creators in the co-design process. In design thinking, traditionally the design team is made up primarily of internal stakeholders, and the team engages with external stakeholders through research and testing activities. In contrast, the co-design process actively integrates children into all aspects of the design process from idea concept to solution (Druin, 2002). Walsh’s method of modified KidsTeam in libraries melds the process and steps of design thinking with the engagement of child library patrons as co-designers (Walsh, 2018). The KidsTeam Project Repository offers guidelines for individuals “who want to run their own intergenerational design teams” in their community (Walsh, 2018/2020). He positions the repository as originally being designed for public librarians in Baltimore City but also suggests it could “be useful to any organization who wants to

include more voices in the design process but realize it requires much more work” (Walsh, 2018/2020). The three sections of the repository are: Manual, Worksheet and Additional Resources. My exploration of a standalone KidsTeam toolkit for public librarians expands upon this call. This draft aims to discover the elements and structure of a KidsTeam toolkit specifically for individuals in the public library setting.

### **Collaborative Design Thinking (CoDeT) Procedure**

We can get some additional insight from others in the co-design field who have created toolkits for co-design with children that are geared towards researchers, designers and those in the field of education. In his dissertation, Maarten Van Mechelen posits that there are two challenges that the CCI community faces when developing and assessing co-design experiences with children: (1) “facilitating group dynamics between children in co-design activities”; and (2) “analyzing co-design outcomes in a rigorous and co-herent way” (Van Mechelen, 2016, p. 67). Through a Research through Design (RtD) approach and case studies, Van Mechelen posits that two procedures can help alleviate these challenges. First, a Collaborative Design Thinking (CoDeT) procedure to help diminish challenging group dynamics with the goal of “scaffold[ing] children’s creative abilities by introducing Design Thinking mechanisms” and “facilitating children’s collaboration by structuring work-group features and mitigating challenging intragroup dynamics” (Van Mechelen, 2016, p. 270). Second, Van Mechelen proposes a method he hopes will allow for “rigorous” evaluation of outcomes, called the GLID Analysis Method. This method helps to “identify the values embedded in co-design outcomes resulting from the CoDeT procedure” (Van Mechelen, 2016, p. 286) by iteratively working through four distinct steps: “(1) Grounding the analysis, (2) Listing design features, (3) Interpreting orientation and organization, and (4) Distilling discourse and values” (Van Mechelen, 2016, p. 289). The toolkit offers step-by-step guidance and advice for practitioners both in and outside of academia for utilizing CoDeT and GLID in tandem when utilizing co-design to create new technologies for and with children.

### **Interaction design & children toolkit**

More recently, researchers focused on Interaction Design for Children (IDC) have created toolkits that are more of a conglomeration and synthesis of past research in the field, targeted towards other practitioners in IDC, CCI and the like. The “Interaction design & children toolkit” was created in order to increase accessibility and actionability of IDC research findings so that industry professionals can utilize and apply those findings into their work (Chen et al., 2020). The online toolkit organizes information by “dimension” of research topic. Once a “dimension” is selected, further prompts enable the user to choose a design phase and read through associated research (Chen et al., 2020).

### **A Co-Design Toolkit Designed Specifically for Public Librarians**

While the above are just some examples of toolkits designed for co-design with children, from methodological and content perspectives these kits can offer insight into the development of an actionable toolkit for non-traditional designers, such as public librarians, to utilize when leading co-design sessions with their youth patrons. We can find additional support for a co-design-with-children toolkit for public librarians in the mission of public libraries on the international level. Founded in 1927 and deemed as “the leading international body representing the interests of library and information services and their users” (*IFLA -- About IFLA*, n.d.), the International Federation of Library Associations and Institutions (IFLA), in conjunction with the United Nations Educational, Scientific and Cultural Organization (UNESCO), outline 12 key missions of the public library, two of which are particularly relevant to this research: “3. providing opportunities for personal creative development; [and] (4.) stimulating the imagination and creativity of children and young people” (*IFLA -- IFLA/UNESCO Public Library Manifesto 1994*, n.d.). Both of these missions echo previously discussed goals of CCI and co-design with children researchers and offer additional support for public librarians using the co-design methodology, specifically KidsTeam, as one of KidsTeam’s goals is: “to co-design technologies that support children’s learning and play” (*KidsTeam*, n.d.).

Further, creating a co-design with children toolkit for librarians of this nature could act as an additional resource for librarians to create child-centric programming that meets the unique needs of their communities. We can find additional support for a co-design toolkit that acts as a resource for librarians to help adjust their programming and resources to the needs of their patrons in the IFLA/UNESCO Public Library's Manifesto:

The library services must be adapted to the different needs of communities in rural and urban areas. The librarian is an active intermediary between users and resources. Professional and continuing education of the librarian is indispensable to ensure adequate services. (*IFLA -- IFLA/UNESCO Public Library Manifesto 1994*, n.d.)

Given that public libraries are non-profits with limited resources, a co-design toolkit specifically created for librarians that is free and easy to use could increase support for and access to the co-design methodology. A co-design toolkit also supports the librarian as an "active intermediary" (*IFLA -- IFLA/UNESCO Public Library Manifesto 1994*, n.d.). Finally, utilizing the public library space for co-design sessions could provide greater access to the co-design methodology within and across libraries' communities (refer to the previously discussed section on *Design Session Environment*, specifically (Walsh, 2018)).

Out of these calls to action and the position of the public library in communities, I posit that a co-design with children toolkit specifically created for public librarians is in line with public library goals and thus could be a beneficial resource for public librarians and their libraries to use in order to help achieve those goals.

## Chapter 3: Methodology

### Methods

This is an exploratory study meaning the primary research goal is to “examine the effectiveness of preliminary design concepts” (Rubin & Chisnell, 2008, p. 29). My research questions and research methodology reflect this, as my goal is to explore and assess a first draft of a standalone KidsTeam Toolkit for public librarians. Informed by previous work, specifically Walsh’s KidsTeam Project Repository (Walsh, 2018/2020), my guiding research questions are: (1) What does a first draft of a standalone KidsTeam toolkit (Toolkit v.1) look like for librarians working in public libraries?; and (2) What do librarians need when conducting and facilitating KidsTeam co-design sessions with their youth patrons without academic research staff present? In order to gain more insight into these questions, I limited my participant pool to librarians in a public library system in Maryland who previously co-facilitated Walsh’s refined KidsTeam co-design method with local academic researchers. I conducted three stages of research: (1) Exploring Toolkit v.1 Design; (2) Toolkit v.1 Creation; and (3) Assessment and Evaluation of Toolkit v.1. I will explore these stages and their results in greater detail in Chapter 4: Process Documentation.

This research is rooted in grounded theory based on the seminal research of Druin’s cooperative inquiry and intergenerational design teams, specifically the KidsTeam model (Guha et al., 2013), and more recently in direct response to Walsh’s modified KidsTeam model co-facilitating co-design sessions in public librarians with librarians (Walsh, 2018) and the online-based KidsTeam Project Repository (Walsh, 2018/2020). I took a Research Through Design (RtD) approach which those in the field of HCI posit allows for researchers to engage in “wicked problems” more readily in ways that create research artifacts that “can be transferred and utilized by others in the field” (Zimmerman et al., 2007). This is in line with the primary goal of this research and the reasoning behind my three-stage research process. The data collected from Stage 1 led to

the creation of the design artifact in Stage 2, which in turn, led to the research design for assessing that artifact in Stage 3. A RtD approach supports my primary research goal of creating a standalone KidsTeam toolkit that librarians can use, and other applied researchers can further develop and refine. Below I outline the participants I selected for this exploratory study. I then give a high-level overview of my data collection and analysis procedures for each of the three stages.

### **Participants**

I identified 3 librarians from a public library system in Maryland who previously co-facilitated KidsTeam co-design sessions in their public libraries. They co-facilitated alongside local academic researchers utilizing Walsh's refined KidsTeam method. For the purposes of this research, co-facilitating means that each librarian had a supporting role in the design sessions but did not lead the sessions on their own. I reached out to each participant via email and explained the nature of the study to gauge their interest. I then sent the consent form via email which each participant signed, agreeing to the video/audio recording of the interviews for data analysis purposes. Due to the COVID-19 restrictions, all data collection was done via phone or the online video conferencing platform, Zoom. All 3 librarians participated in both Stage 1 (open ended interviews about their experiences as a co-facilitators) and Stage 3 (Toolkit v.1 usability assessment and interview questions). This research was approved by the University of Baltimore's Institutional Review Board.

### **Data Collection and Analysis**

The stages of data collection/analysis and toolkit creation were: (1) Exploration of Toolkit v.1 Design; (2) Toolkit v.1 Creation; and (3) Evaluation and Assessment of Toolkit v.1. The data collected was both qualitative (open-ended interview responses) and quantitative (individual participant results of usability assessment). Both Stage 1 and Stage 3 used interview questions to better understand the librarians' experiences co-facilitating co-design sessions with their youth patrons in the past (Stage 1) and their feedback on how they would use Toolkit v.1 if they were to facilitate a KidsTeam

program in the future (Stage 3). In Stage 1, the questions were predominately exploratory and open-ended in nature. For this qualitative data, I conducted emergent coding through participant responses. First, I transcribed each interview scrubbing for personal identifying information (PII). Then, a second researcher also coded the anonymized text-data using the code book I created from the data. We had two rounds of coding in order to reach agreement. After coding one interview and reaching agreement, I refined the codebook to reflect our agreement and any edits we made to the codes. We then coded the remaining interviews and met a second time to discuss our codes in order to reach overall agreement. More details on this process in Chapter 4: Process Documentation.

As I was collecting and analyzing the data from Stage 1, I simultaneously moved into Stage 2 in which I created Toolkit v.1, the online-based interactive paper prototype. Based on the Toolkit v.1 design artifact, I decided to conduct a usability assessment and follow-up interview for Stage 3. I chose to conduct a usability assessment on Toolkit v.1 in order to see “how well a user can actually perform full-blown realistic tasks and [identify] specific usability deficiencies” (Rubin & Chisnell, 2008, p. 35). I created the usability assessment tasks based off of the information gleaned from Stage 1 in conjunction with the Toolkit v.1 design artifact from Stage 2. I presented participants with two scenarios and a total of 11 tasks to complete. Two of these tasks were multi-part and the last task was open-ended. I collected data on individual participant success rate for 10 of the tasks and assigned a numerical value to each in order to quantify the individual results. Participants either completed the task successfully (S) (10), partially completed the task (P) (5) or did not successfully complete the task (NS) (0). I defined success prior to the usability assessment, noting the correct answer(s) for each task in my usability assessment chart, and thus marked a participant’s success based on those answers. Some of the tasks had two or three correct answers given that some information is in multiple places in the toolkit. Partial success was given in specific cases in which the participant located the general section where the information was to be found but, they didn’t correctly identify the specific answer. During the usability assessment, I asked

participants to think aloud while they went through the tasks so I could gain a better understanding of their thought process. I took notes throughout, observing their mouse movements and other behavioral aspects to capture a more complete understanding of the participants' interactions with the toolkit.

Post-usability assessment, I asked a series of questions around specific aspects of the toolkit to get their perspective. The questions focused on: (1) First impressions of Toolkit v.1 and Content; (2) Structure and Organization of Toolkit v.1; (3) The Worksheet and Template Sections; and (4) Distribution Methods. I transcribed these interviews in full, scrubbing for PII. Since the nature of these questions were more targeted, addressing specific aspects of Toolkit v.1, I didn't code this data. Rather, I analyzed and synthesized the participant responses, noting for similarities and key differences. From there, I combined the quantitative and qualitative results of the usability assessment with the post-usability assessment interview data. Out of this analysis, in conjunction with the findings from Stage 1 and 2, I make recommendations for Toolkit v.2 while noting sections and elements that need further exploration. See Chapter 5: Design Artifact Recommendations for a full list of recommendations.

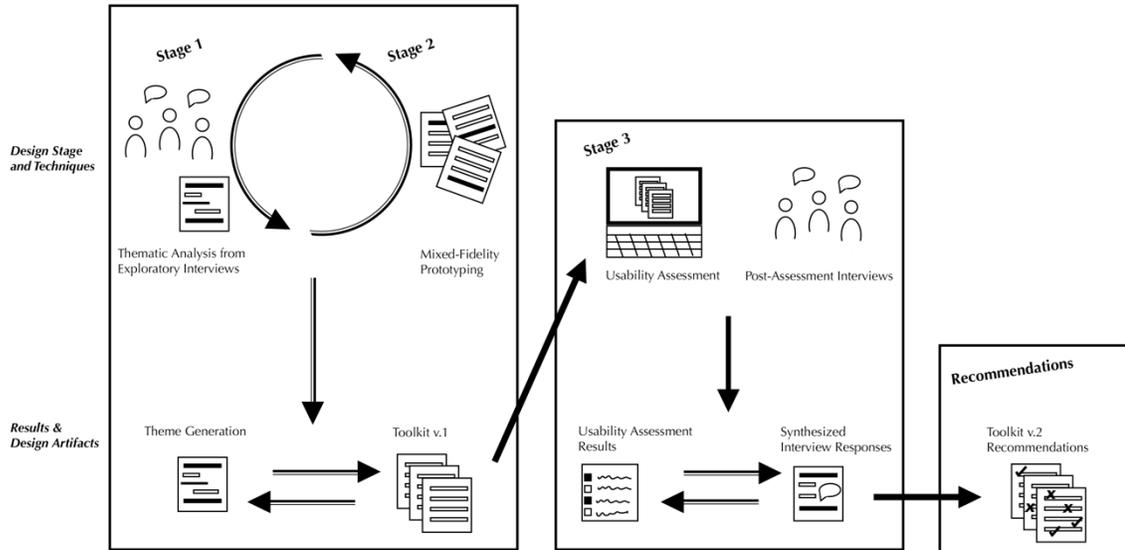
## Chapter 4: Process Documentation

### **RtD Process Documentation**

Given my RtD approach of iteratively transforming data analysis into tangible design elements, each stage of research was contingent upon the data gleaned from the research conducted before it. I believe my research documentation should accurately reflect this distinct process, as it strays from other behavioral science research methodologies. HCI practitioners have argued that the RtD *process documentation* is essential when “capturing and translating primary design knowledge into broader academic knowledge” (Bardzell et al., 2016, p. 96). Further, the authors assert that this type of documentation “allows RtD practitioners to explore the materiality, form and interactivity simultaneously that generate knowledge about materials pertaining to what it can and can not do, its strengths and limitations, etc.” (Bardzell et al., 2016, p. 96). The authors provide three distinct examples of HCI RtD process documentation. They make the claim that across the board, RtD process documentation has three “core qualities:” medium, performativity and support for RtD (Bardzell et al., 2016, p. 98). While all three aspects are evident in my documentation, the quality of “performativity” is especially relevant for my research as my goal is to provide a KidsTeam Toolkit that researchers and librarians alike can utilize. My choice in research design reflects this as well, as I incorporate a usability assessment of Toolkit v.1. The authors assert that RtD documentation “...does not merely describe what happens, but it constitutes a form of action” (Bardzell et al., 2016, p. 98). I will explore this further in Chapter 5: Design Artifact Recommendations, where I offer tangible recommendations for Toolkit v.2 along with discussion of its strengths and limitations in achieving its intended goals.

With these principles guiding the presentation of my RtD process and research findings, this chapter expands upon each stage of the design process and how the data from Stage 1 was iteratively analyzed and interpreted in Stage 2 in order to build Toolkit v.1. The process of creating that design artifact in turn determined the research design for Stage 3. Those results then led to my recommendations for Toolkit v.2. See Figure 1

below for a visual of my process.



*Figure 1.* Visual of my three-stage design process that resulted in recommendations for Toolkit v.2.

In the following sections, I present my overarching findings for each of the design stages and how they impacted the next stage. Keeping in line with Bardzell et al., I incorporate a variety of media that I used throughout the design process including draft sections of Toolkit v.1, lists, tables, and figures (Bardzell et al., 2016, pp. 98–99). Further, I position Toolkit v.1 as a “speech act document” in which I not only describe Toolkit v.1 as a “newly acquired design material” but I also “explore,” “propose” and “justify” design decisions and directions (Bardzell et al., 2016, p. 99). Finally, as a whole, my process documentation aims to support an RtD approach in which the Toolkit v.1 design artifact expands upon prior RtD research and can in turn be utilized for future research on the topic.

In Chapter 5: Design Artifact Recommendations, I continue to contextualize the results from all three stages in the larger narrative of exploring and designing Toolkit v.1, which led to recommendations for Toolkit v.2. There I provide greater detail about the transformation of research findings into actionable design recommendations for Toolkit v.2.

### **Stage 1: Exploration of Toolkit v.1 Design**

To inform the creation of Toolkit v.1, I wanted to explore librarians' past experience with KidsTeam and what resources academic researchers could provide them when leading KidsTeam sessions on their own. I conducted individual interviews with each of the 3 participants for approximately 1 hour over the phone or Zoom. Each participant consented to the recording of our conversation for data analysis purposes. The open-ended interview questions focused on understanding the librarian's past experience as a KidsTeam co-facilitator and what materials they would need to feel comfortable facilitating these co-design sessions in their public library without an academic researcher present. I asked them questions about each stage of the co-design implementation process, from preparing for each session to co-facilitating the actual design sessions. I then asked them some more focused questions about a KidsTeam toolkit they could use in the future. Within each section of questions, I let the participant guide the conversation so some of the questions evolved depending on participant answers. See Appendix A for a full list of interview questions.

At the conclusion of all the interviews, I transcribed the interviews, scrubbed them for PII and condensed elements for clarity. From there, I conducted thematic analysis on the interview data, following John W. Creswell and J. David Creswell's five step qualitative data analysis procedure (Creswell & Creswell, 2018, pp. 193–194). This process begins by reading through all the data presented, developing a preliminary code-set with brief descriptions, creating themes and descriptions and finally interrelating and interpreting those themes (Creswell & Creswell, 2018, pp. 193–194). From the three interviews, I began the process of emergent coding, one of the methods of coding for grounded theory, in which the researcher does not work with a pre-set of codes but rather lets the codes emerge from the data as they see them. By establishing these emergent codes in the first stage of data analysis, I began the inductive stage of grounded theory, the "iterative process of going back and forth between data collection and analysis" (Charmaz, 2008, p. 168). They argue that the nature of this emergent method allows for

researchers to be surprised and facilitates “further imaginative engagement with data” (Charmaz, 2008, p. 168). This further supports my reasoning behind not creating pre-determined codes based on prior research in the field, specifically, Walsh’s KidsTeam Project Repository (Walsh, 2018/2020).

From this first round of coding, I created a codebook with 43 distinct codes, each accompanied by a definition and examples from participant interviews. I then organized those codes into 7 overarching categories: (1) Program Audience; (2) Program Engagement; (3) Program Logistics; (4) Program Outcome/Goals; (5) Facilitators Leading Programs; (6) KidsTeam Program Interpretation and (7) Toolkit Specifics. From that codebook, a second researcher coded one of the interviews. Coders were able to use multiple codes to describe a passage depending on the context. Given the “nuance” of utilizing the “splitter” tactic of coding, in which one passage can be represented by multiple codes (Saldana, 2015, p. 23), it was essential that the second coder and I met in order to establish agreement. We met virtually to discuss our coding choices for one interview. From that discussion, we established agreement on our coding choices and created an updated codebook that resulted in two additional codes making the final total 45 codes within 7 categories. The categories and the codes within them remained the same.

From there, we both separately coded the two remaining interviews using the updated code book. During this time, I began the process of clumping codes together to discover larger themes. I started by sifting through the coded elements of the first coded interview document and collected pieces of text with similar codes together into a separate document. This allowed me to compare the data within and across coded elements in order to discover similarities and differences. I synthesized the data into a table which included: theme, general description, codes and participant support/evidence. As I continued to code more data, I began the process of creating Toolkit element(s) and correlating them with each theme. Once the second coder was finished coding the

remaining interviews, I compared the documents, noting for disagreements. We then met again virtually to discuss any discrepancies and establish agreement.

I continued the iterative process of reviewing, refining and categorizing codes into larger themes. I did so by placing pieces of coded text from the other two interviews into their appropriate coded categories. This gave me a fuller picture of the codes in the context of all interviews, which then became a basis for the next stage of my research process in which I created Toolkit v.1 through the iterative process of transforming thematic analysis into the toolkit design artifact. Given the interdependent relationship between my interpretation of the interview data and the design of Toolkit v.1, I present how the results of the interviews informed the four themes and resulting Toolkit v.1 elements in the next section.

### **Stage 2: Toolkit v.1 Creation**

As I was building Toolkit v.1, the themes continued to morph and dwindle. Through my data analysis, I formed four main thematic categories, each of which are action oriented and directly correspond to specific elements of Toolkit v.1 (see Table 1). In the table, I assigned a symbol to each Toolkit Element based on its location in Toolkit v.1.

Table 1

#### *Stage 1 & 2: Thematic Categories and Toolkit v.1 Elements*

<b>Thematic Category</b>	<b>Toolkit v.1 Elements</b>
(1) Easing hesitancy and boosting confidence by providing expert resources on design and other technology topics	KidsTeam Goals & Background * KidsTeam Process and Phases, Outline and Specifics ** Stages of the design process and phases # Additional Resources * Create Your Own KidsTeam Program Worksheet +
(2) Providing resources to help with advanced planning and preparation	Planning Your Program Timeline ++ Stages of the design process and phases # Supplies List * Past Examples (embedded in 5 Phases, Activity Ideas and Additional Resources sections) ##

(3) Ability to tailor the KidsTeam program to youth patron's and librarian's needs and goals, taking into consideration the limitations for both	Create Your Own KidsTeam Program Worksheet + Goals ++ Design Challenge ++ Planning Your KidsTeam Programs: Best practices * Tips ##
(4) Clarity through program specificity and desired outcomes or goals	Toolkit and Worksheet Purposes ** KidsTeam Goals & Background * KidsTeam Process and Phases, Outline and Specifics ** Stages of the design process and phases # Past Examples (embedded in 5 Phases, Activity Ideas and Additional Resources sections) ##

*LEGEND*\* = *Entire Toolkit Section*\*\* = *Toolkit Subsection*+ = *Entire Worksheet Section*++ = *Worksheet Element*# = *Visuals*## = *Embedded Elements*

As Table 1 illuminates, several toolkit elements correspond to multiple themes. This is due to the fact that I was allowing for the data to guide the structure of the toolkit and that structure to further guide my interpretation of the data. This reflects the cyclical nature of the toolkit creation in which the discovery of themes impacted sections of the toolkit which in turn impacted my interpretation of the themes. The continual refinement of themes and toolkit elements throughout the process allowed for the exposure to new pieces of data in context of the toolkit to drive the design.

While I was synthesizing and analyzing the data to uncover and refine the themes, I was simultaneously synthesizing those emergent themes with the KidsTeam Project Repository (Walsh, 2018/2020) in order to conceptually understand and build Toolkit v.1. See Appendix B for access to the repository in full. Table 2 below visualizes how the content and structure of the KidsTeam Project Repository translated into Toolkit v.1. I expand upon these choices throughout the remainder of this chapter.

Table 2

*Walsh's KidsTeam Project Repository as reflected in Toolkit v.1*

<b>Walsh's KidsTeam Project Repository Element</b>	<b>Toolkit v.1 Usage</b>	<b>Toolkit v.1 Location</b>
Welcome! <i>(subsection of README)</i>	Kept the concept but re-wrote to represent Toolkit v.1's purpose	Welcome (Toolkit Purpose; Worksheet Purpose)  KidsTeam Goals & Background
Manual Introduction	Kept the concept but re-wrote to represent Toolkit v.1's qualities	KidsTeam Goals & Background
Space and Time <i>(subsection of Manual)</i>	Split up into three sections: (1) Scheduling a Time for Your Program Sessions (2) Recommended Program Session Length (3) Setting up Your Design Space	Planning Your KidsTeam Process: Best practices
Design Sessions <i>(subsection of Manual)</i>	Content is verbatim  Created a graphic to visualize the 5 Phases and incorporated distinct headers for each Phase using this graphic  Pulled out and bolded key information regarding time and goals	Overview of the 5 Phases of an Individual Design Program Session  Specifics of the 5 Phases of an Individual Design Program Session
KidsTeam Session Planning Worksheet	Content is verbatim  Changed the title name to "Program Session Template"	KidsTeam Program Session Template
Additional Resources <i>(includes subsections: "Background Information" and "Useful Techniques")</i>	Created new section titled: "KidsTeam Examples"  Expanded and altered background information to: "Background on KidsTeam and Designing Technology with and for Children"	Additional Resources

	Expanded “Useful Techniques” to “Activity Ideas and Design Techniques”	
--	--	--

In this next section, I outline how the data gleaned from Stage 1 impacted the creation of Toolkit v.1 by outlining each of the four themes, their resulting Toolkit v.1 sections and the adapted elements of Walsh’s KidsTeam Project Repository. Then, I explore how the results of my thematic analysis directly impacted the structure, content, style, presentation and format of Toolkit v.1. There I provide a high-level outline of these design elements below with some examples. I also explore how specific design elements influenced the research design of my usability assessment for the evaluation of Toolkit v.1 in Stage 3.

### **Thematic Analysis Informing Toolkit v.1 Elements**

In this section, I explore the four themes I discovered through thematic analysis and the creation of Toolkit v.1. The themes are:

1. Easing hesitancy and boosting confidence by providing expert resources on design and KidsTeam specific topics
2. Providing resources to help with advanced planning and preparation
3. Ability to tailor the KidsTeam program to youth patron’s and librarian’s needs and goals taking into consideration the limitations for both
4. Clarity through program specificity and desired outcomes or goals

For each theme, I provide a table outlining which Toolkit v.1 elements support this theme as well any sections of Walsh’s KidsTeam Project Repository that I adapted as a result. I then provide details regarding how I iteratively analyzed and synthesized Stage 1’s Exploration of Toolkit v.1 Design data to create the Toolkit v.1 design artifact in Stage 2.

#### **Theme 1: Easing hesitancy and boosting confidence by providing expert resources on design and KidsTeam specific topics**

Table 3

*Toolkit v.1 and Walsh's KidsTeam Project Repository elements supported by Theme 1*

<b>Toolkit v.1 Elements</b>	<b>Walsh's KidsTeam Project Repository Elements</b>
KidsTeam Goals & Background	
KidsTeam Process and Phases, Outline and Specifics	Design Phases
Stages of the design process and phases (graphic)	Design Phases
Additional Resources	Additional Resources
Create Your Own KidsTeam Program Worksheet	Worksheet

Throughout Stage 1's interviews, participants expressed some hesitancy leading or facilitating KidsTeam workshops on their own without researchers present. As mentioned earlier, these participants all had experience supporting researchers in delivering KidsTeam programs in their libraries but did not lead them themselves. There was even some relief around being in that support role, with one participant remarking that "because [they were] new at this, [they] didn't really feel comfortable about leading so [they were] glad [they were] a support role" (P3). P2 acknowledged that it was to be expected that "[they] didn't know what some of the stuff was, because it was still pretty new to [them]" (P2). But they felt that overall, they "understood the structure of the program" (P2).

There was also a sense that part of the success of the program was in part due to the researcher's expertise delivering KidsTeam programs. P2 remarked on the researcher's ability to connect with the child participants on an emotional level which they believe helped increased the children's engagement and is not something they've "been able to...replicate since" (P2). P3 offered a similar sentiment: "it took a very special kind of person with a good open approach to make [KidsTeam program] run successfully" (P3). However, through analysis of the interview data, I interpreted that the participants' confidence might be boosted if they were provided with specific resources that they could access in order to learn and prepare. They all expressed an openness to trying new things, but they expressed that providing access to additional resources that

they could seek out on their own as a key to their success in implementing the program. For example, P1 in response to a question around what they would like to see in a toolkit said: “things with videos that I could show if it was for a specific concept that I wasn’t familiar with. If it was for...a little bit more high maintenance concepts so that way I wouldn’t have to worry if I was explaining it correctly” (P1).

While they expressed concerns about not being able to explain a specific concept that they are unfamiliar with, I interpreted that providing access to some expert resources on specific topics directly in the toolkit would help them overcome that worry. P2 also remarked that while they may feel confident leading a program on their own because they’ve already had experience going through the program, other future librarians may be more hesitant, specifically noting that “specific aspects of [the KidsTeam program] would be a little nerve racking if you’re not familiar with it” (P2).

These sentiments reinforced my choice to include the following toolkit elements: “Additional Resources,” “Overview of the KidsTeam Design Process,” “Specifics of the KidsTeam Design Process,” “Overview of the 5 Phases of an Individual Design Program Session” and “Specifics of the 5 Phases of an Individual Design Program Session.” The “Additional Resources” section was adapted from Walsh’s KidsTeam Project Repository as I added more direct links to resources on specific design activities, techniques and past KidsTeam programs. The “Overview & Specifics Sections” for both the “Design Process” and “5 Phases” aimed to provide clear and specific information about the breakdown of each of the 3 design stages, their 5 phases and how they interact. I also included high-fidelity graphics for both the stages and phases, as I thought this may increase the conceptual understanding of the interaction between the stages and phases. See Figures 2 and 3 below. Snippets of these images are placed throughout Toolkit v.1 to reinforce concepts and assist in wayfinding of information. I explore these choices later in this chapter in the “Style and Presentation” section.

## KidsTeam Process for Multi-Week Programs

Collaborative creative problem solving with children and adults

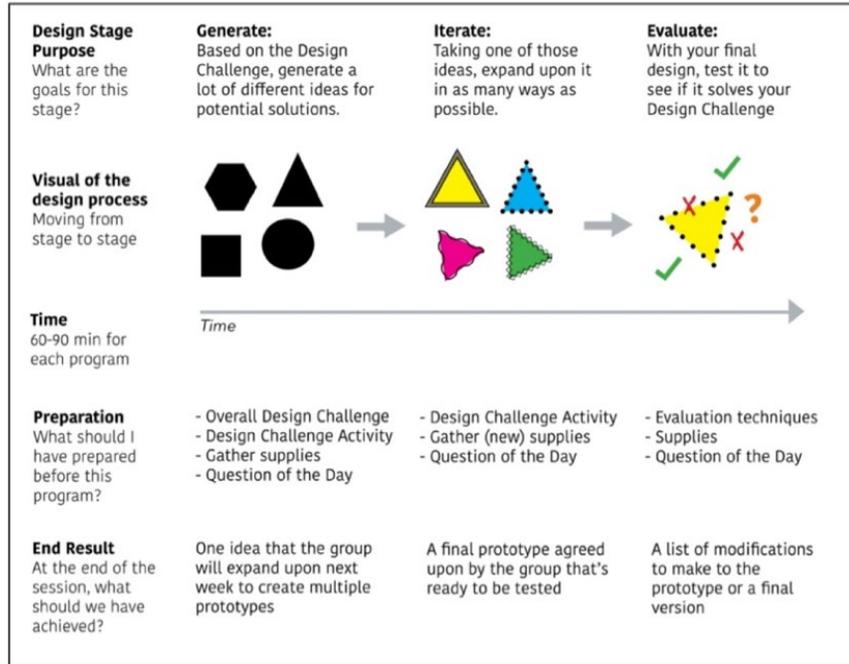


Figure 2. “KidsTeam Process for Multi-Week Programs” graphic.



Figure 3. “Overview of the 5 Phases of an Individual Design Program Session” graphic.

This choice of providing text and graphic versions of this information was supported by my data analysis that revealed some procedural and conceptual confusion about the KidsTeam process and implementation. I explore this concept further in Theme 4.

The other Toolkit v.1 elements of “KidsTeam Goals & Background” and “Create Your Own KidsTeam Program Worksheet” were also informed by Theme 1 as the content of both were designed to boost confidence when leading a program without researchers, specifically, for those who have not co-facilitated before and may need more

information about how the program runs. I provide further support for this choice in my discussion on Theme 2 below.

**Theme 2: Providing resources to help with advanced program planning and preparation**

Table 4

*Toolkit v.1 and Walsh's KidsTeam Project Repository elements supported by Theme 2*

<b>Toolkit v.1 Elements</b>	<b>Walsh's KidsTeam Project Repository Elements</b>
Planning Your Program Timeline Stages of the design process and phases (graphic) Supplies List Past Examples ("5 Phases...", "Activity Ideas..." and "Additional Resources" sections)	Design Phases  Space and Time (subsection of Manual) Design Phases; Additional Resources

Through Stage 1, I discovered the need to plan library programs far in advance as I learned more about how librarians often times have sole ownership over their programs. While the participants expressed they can get help from others, it is often up to them to create, plan and execute their programming for their youth patrons. P1 remarked how "most of the programs [they] come up with [themselves] and do all the planning for and support for" but, they can always get support from their colleagues if need be (P1). P3 expressed a similar experience:

I've been fortunate that I can bounce things off of my coworkers, especially my managers and say,...'What do you think about this?' And we put our heads together...but you are still responsible basically for your own program. (P3)

P2 also expressed support from their manager to create programs on their own and it was from that support that facilitated "how a lot of [their] programs got done" (P2). With that, the participants expressed how their planning must be done well in advance as their internal process requires submitting program plans several months before a program is held in the library. For example, P3 remarked that at the time of the interview they were

“planning for materials for programs in [2-3 months]” (P3). P2 affirmed a similar procedure as they remarked how they had a recent deadline for a program plan and “those [were] for the [2-3 months away] programs” (P2). Providing resources to help with that planning, especially for a multi-week program, seemed to be a necessity given the nature of their current program planning procedures.

In each of the participant’s cases, the KidsTeam program came into their library pre-planned and they were there as support roles so they did not have a hand in the planning as they normally would. Based on our conversations, I interpreted that this could have led to some confusion in the beginning about what was going to happen and when. But participants noted that after partaking in a couple of sessions, they were all able to understand the process. P1 remarked: “[The KidsTeam Program] was great once I understood it a bit better” (P1). P3 also expressed that in the beginning they were confused but later remarked how “watching the whole process through was good” and that they would “just have to know how to plan it so that it’s not overwhelming” (P3). As mentioned earlier, P2 was aware of and seemed ok with not understanding some of the content, reminiscing, “obviously I didn’t know what some of the stuff was, because it was still pretty new to me...but I think I understood what [they] were about” (P2). When asked what would empower more librarians to utilize KidsTeam, P1 offered that “help[ing] with the actual project theme, what it is” would be beneficial, “since each [library] location has kind of different makeups” (P1). Toolkit v.1 was designed with this in mind as I posit that having more control over the planning and procedures of implementing KidsTeam will alleviate some of KidsTeam procedural and conceptual confusion.

In further attempts to alleviate some of this confusion, I chose to incorporate visuals of the design process as a whole in addition to the phases of each individual program in Toolkit v.1. Reference Figure 1 and 2 in Theme 1 for visuals. I believe that the visual of the full KidsTeam process will help give librarians a clear overview of what to expect for the multi-week program and offer guidance on how to plan for that well in

advance. My data analysis also offered support for incorporating past examples of KidsTeam throughout Toolkit v.1, as such information attempts to put the process in context of the program. These examples are incorporated throughout several sections of the toolkit including: “Specifics of the 5 Phases of an Individual Design Session Program,” “Activity Ideas” and “Additional Resources.” Walsh’s KidsTeam Project Repository section “Design Sessions” wove in past examples throughout his discussion of the 5 Phases, thus I kept this information verbatim in Toolkit v.1, moving it to the new section “Specifics of the 5 Phases of an Individual Design Session Program.” I also referenced Walsh’s article on the “Anatomy of a Design Session” at the end of this section as it gives a detailed explanation of each stage in the context of a past KidsTeam program (Walsh, 2013). I also adapted Walsh’s KidsTeam Project Repository’s “Additional Resources” section to include more examples of past KidsTeam sessions.

In addition to providing information to support advanced program planning in the form of planning timelines and past examples, my data analysis uncovered that the toolkit elements should reflect the fact that each library has a unique set of needs when planning the specifics of their programs. P2 remarked that during their past KidsTeam session, it helped that the researcher discussed with them “how [P2] would ordinarily run programs because [the researcher] didn’t want to jar it too much from what [P2’s library is] used to” (P2). The planning and implementation of KidsTeam should allow for flexibility so it can remain consistent with current programming models, as I discovered this may help with program attendance and a child’s engagement with - and their understanding of - the program. I explore this further in Theme 3 but wanted to touch on it here as it also applies to planning and preparation

To accommodate for this, I incorporated a “Program Planning Chart” in the “Planning Your Program Timeline” portion of the “Worksheet” that allows them to fill in their own timeline for planning. See Figure 4 below for a visual. However, the participants were also vocal about the importance of the researchers suggesting what has worked for them in the past. When I asked P3 if including “milestones” would help with

advanced program planning, they were receptive to that idea. They added: “if you all have an idea of what works for you all, then that would be helpful” (P3). I interpreted this as the participant’s recognition that this is a program researchers have delivered before, so there may be some best practices that they could benefit from when leading on their own. Thus, in the timeline chart I put in an “Example Timeline” that offers suggestions for what to complete by when.

### Planning Your Program Timeline

When planning your program(s), you’ll need to decide how many individual program sessions you will have and how much time in between each program. Past KidsTeam work in libraries have done a weekly format with 4-5 individual program sessions total.

#### Desired Date(s) and Time(s) of KidsTeam Program(s):

	Date	Time	Location
<b>Program Session</b>	<i>Consider how much time will be in between programs</i>	<i>Select a time when there will be a consistent group</i>	<i>Note if you’ll have to use various locations in the library</i>
1			
2			
3			
4			

#### Programming Planning Chart

Time Before 1st Program	My Timeline	Example Timeline
3-4 Months		<i>Determine Design Challenge; Talk with customers about their interests and timing for programs</i>
2-3 Months		<i>Seek approval and put in formal request for the program</i>
1 Month		<i>Research design activities that could be used in program sessions</i>
2 Weeks		<i>Ensure space and supplies are secure</i>
Week Before		<i>Advertise the program and talk to children about participating; Gather snacks</i>

Figure 4. “Planning Your Program Timeline” portion of “Worksheet.”

Finally, there was much discussion around the multi-week format of KidsTeam and how that is something that they don’t usually do for a variety of reasons. There was

consensus that they host self-contained programs or programs that don't build from week to week in part due to their inconsistent audience base and the small window of opportunity to host programs. But P2 did note that the length of the individual KidsTeam programs (60 minutes) was consistent with what programming they were already doing in the library and that was very appealing to them. They said that "...all together [the library has] a very short period of time where we have [the youth patrons] so it needs to fit within that" (P2).

So while the length of the individual program was consistent with current library programming, the multi-week format of building off of those individual programs could have led to some procedural and conceptual confusion on behalf of the child participants as P2 noted: "we did have some trouble with...week-to-week, like, what's going to happen with [the design they created] after...[the child participant] take[s] it apart this week" (P2). They remarked how the children weren't used to a multi-week program and thus the concept of building on a creation each week was foreign to them. Also, P2 recognized that the procedure of not taking an item home with them that day was different than what they were used to which could have also contributed to some confusion. P1 also recognized the multi-week program format caused some conceptual confusion with the children participants. Though, they thought that part of this was due to the age range of participants and how for some "it's hard to conceptualize what the next task was going to be a full seven days from then and then have to remember that knowledge and have to act on it the following week" (P1).

However, P1 also saw that using the multi-week structure could be a professional development opportunity. They viewed planning multi-week programs as an opportunity for growth:

[it's] something I'm weak on, I don't do that very often at all and I think a lot of my fellow children's librarians are in the same boat so having a toolkit to guide the way to a multi-week program would be great. (P1)

P3 also saw a professional development opportunity. They described incorporating a general outline of 6 months of planning for programming, suggesting “that would be helpful because I don’t think many people know how to plan long-range plans” (P3). With all of this in mind, I structured the “Planning Your Program Timeline” aspect of the “Worksheet” to be a mix of informational tips of how KidsTeam programs have been structured in the past, along with space for librarians to create and customize a plan that works for them. Refer back to Figure 4 for a visual.

**Theme 3: Ability to tailor the KidsTeam program to youth patron’s and librarian’s needs and goals, taking into consideration the limitations for both**

Table 5

*Toolkit v.1 and Walsh’s KidsTeam Project Repository elements supported by Theme 3*

<b>Toolkit v.1 Elements</b>	<b>Walsh’s KidsTeam Project Repository Elements</b>
Create Your Own KidsTeam Program Worksheet Planning Your Program Timeline Goals for My KidsTeam Program Defining Your Design Challenge Planning Your KidsTeam Programs: Best practices Tips	Space and Time (subsection of Manual)

Throughout the interviews, I discovered that participant’s current programming is informed by the intersection of what their patrons want, their goals and also the limitations faced by both patrons (whether that be their ability to access the library at certain times or age-appropriate materials) and librarians themselves (access to resources, space, time, advance planning, etc.). Below, I explore how the specific elements Toolkit v.1 can reflect this need for flexibility in tailoring the KidsTeam program.

I discovered there was an overlap between the goals and processes librarians currently have when creating programs for their youth patrons and those of KidsTeam. One of the key tenets of KidsTeam and its subsequent research is to improve “our efforts to co-design technologies that are more relevant to children’s interests and needs”

(*KidsTeam*, n.d.). From the interviews, I got the sense that the participant's current process for creating programs is similarly rooted in understanding their customers' habits, patterns and interests. I heard several instances of participants expressing how they would get programming ideas by talking directly to their youth patrons. P2 recalls that when they first started at the library and were creating programs, they "worked with the programs that already existed and then [they] spent time examining what [the children] wanted...[r]ather than just jumping into assumptions" (P2). P3 expressed a similar process: "being able to talk to some of the kids and say... 'What do you think you'd like to come to see at the library? What programs could we provide? Is there something special that you all would really love?'" (P3). They followed up saying that they "keep all of that stuff in [their] mind" and it may help inform programs later on (P3). P1 discussed how much of their programming decisions are a mix of education, supporting what the children are learning in school, and fun, emphasizing that:

I feel like educational aspects can be pushed really hard in programs. And I feel like that constant pressure to learn can be a little wearing, so I want to emphasize that the library is a fun non-pressured place to go. (P1)

Yet there are some notable differences between KidsTeam and library programs that seemed to present points of hesitancy for implementation. As mentioned in Theme 2, length of programming is a pain point. All the participants expressed that most of their programming is self-contained rather than a multi-week building program like KidsTeam. There seemed to be a mix of reasons for why this is the case, but a common theme was that their participant pool is varied. P1 mentioned that they were "[surprised]...that [KidsTeam] was multi-step. Just because [they] can't rely on having the same children come to a regularly scheduled activity for multiple weeks" (P1). While P3 stated something similar, noting that "with the KidsTeam, one of the problems was, in our neighborhood, we don't have a lot of kids that are home in the afternoons that could just come" (P3). They said that the timing impacted their participation week-to-week. P2 also had a similar experience saying, "from week-to-week we wouldn't always have the same

kids, or we'd have a group of kids that would be different, or some kids would only come to one session" (P2).

But P2 also noted that they liked the "structure" of KidsTeam programs because "it matched the same times that [they] were already doing [programs], so it fit really well with the programs that [they] already had going on...it just fit in the style and in the delivery of what [they] were already doing" (P2). They further expressed their support for the program saying, "it matched with what the kids wanted to do and where they were able to be" (P2).

It appears that a challenge for the participants is that they don't always have the same children coming into the library consistently due to a variety of factors. They all mentioned that this may just be the case in their library and that other locations may have a more consistent base. P3 expressed how it's "very difficult to get a consistent group" for programs at the library:

If you have a group where sometimes the kids are there and sometimes, they're not or they're there because it's after school and they are there for about 15 to 20 minutes and then their parents come to pick them up, so they didn't really get a chance to get into what the project is, or they move around so much. (P3)

P1 shared a similar experience and offered that a potential solution for this inconsistent participant would be to change the time of the sessions and partner with a school or a class and conduct KidsTeam with them:

[This program could] work during the school day verses after school. I could bus an actual class into the library or even take the activity to their classroom, either would work, I could do both. And then that way, I could have a consistent audience and I could schedule multiple things and they would be expecting it. (P1)

While a toolkit itself won't be able to address the reality of varied participation, "Program Planning Timeline" on the Worksheet attempts to alleviate that pain point as it includes prompting questions about date, time and location for the programs. The goal is

that this fill-in chart will allow librarians to create a program timeline that reflects the needs of their branch and adjust the program to the patterns of their youth patrons. This will hopefully assist with factoring in participation into the program planning.

Additionally, the section “Planning Your KidsTeam Programs: Best practices” contains two sub-sections to address this worry around participation: “Scheduling a Time for Your Programs” and “Varied Participation.” The first offers advice around the timing of past KidsTeam programs (this is cited verbatim from Walsh’s KidsTeam Project Repository (Walsh, 2018/2020)). “Varied Participation” also comes directly from the project repository and acts as an acknowledgement that it is not uncommon for children to participate in some but, not all of the programs. It states: “We allow children to come and go during the activity much like the library programs we’ve observed over time” (Walsh, 2018/2020). In that section, Toolkit v.1 also recommends that it may help to introduce the “design challenge” and explain the KidsTeam process at the beginning of each session in case there is anyone that is new. This may help alleviate some of the confusion youth participants experienced.

Another consideration for tailoring the program to librarian’s needs was the discussion around supplies and resources needed to run a KidsTeam program. Each participant brought up supplies in some capacity throughout our conversation. Whether it was a recognition that the resources a library has are “kind of the de-facto way that things happen” (P2) or in the case of P1 acknowledging that achieving their individual program goals “come[s] down to what supplies do [they] have” which they remarked is “fortunately quite a bit” (P1).

From this, Toolkit v.1 incorporates a suggested “Supplies List.” See Figure 5 below. Since every KidsTeam program is different and may require different supplies, this list was general while making sure to highlight KidsTeam’s “Bags of Stuff” which is one of the techniques most often used by intergenerational design teams when creating low-tech prototypes (Walsh et al., 2013). Toolkit v.1 does not include a visual of “Bags of Stuff,” but it is hoped that later, more stylized versions will include such visuals.

Supplies List
---------------

Referring to the above section on Setting Up the Design Space, you will need the following:

- A room or space that is visible and large enough to spread out but, won't infringe upon the regular happenings of the library
- Large Tables (1 – 2)
- Snacks and water – noting for allergies and dietary restrictions
- White board, large pieces of paper or another place to record the "Big Ideas" from your program session

During Design Time, KidsTeam often uses low-tech prototyping to help illuminate and test design concepts. This means that the final product the group creates may not exhibit its full functionality but, provides the general structure and interactive elements. This allows for "designers to explore different design options for user interaction and application tasks" (Brown et al., 2010).

To support low-tech prototyping, KidsTeam uses supplies inspired by the "Bags of Stuff" technique mentioned earlier. These bags consist of "arts and craft supplies such as yarn, Styrofoam shapes, glue, paper, markers, scissors, and cardboard rolls" (Walsh et al., 2013).

TBD: Image of  
"Bags of Stuff"

**Tip:** Think about the supplies you might have in your library that may be left over from other programs or items that you've been looking to put to use.

*Figure 5. "Supplies List" found in "Planning Your KidsTeam Process: Best practices."*

Finally, the "Create Your Own KidsTeam Program Worksheet" was designed specifically so that librarians have the opportunity to tailor each element of the KidsTeam implementation process to their unique needs. The "Worksheet" starts out with a place for them to adjust their timeline to their needs, which Theme 1 and 2 discussed is of importance for librarians. The "Worksheet's" next section on "Preparing the Design Specific Activities" provides a space for librarians to write out their own specific goals for the program to provide further agency over the program and its outcomes. See Figure 6 below. I included this section because each participant explicitly described some of their goals for programming throughout our discussions. P3 discussed how their programming goals were focused on teaching and providing the children with "life skills" (P3). P1 mentioned their goals were to "prioritize fun, with an underlying educational aspect" (P1). And P2 stated: "One of my professional goals is to make science adjustable to children" (P2). After the "Goals," the worksheet then provides space for them to write

out their KidsTeam program “Design Challenge” as it could help them meet their unique goals.

### Preparing the Design Specific Activities

*Specifics of the KidsTeam Design Process*

*Activity Examples*

#### Goals for My KidsTeam Program

To help with planning the overall Design Challenge and individual design program sessions, think about what goals you want to achieve through KidsTeam. List them below:

Goal 1:

Goal 2:

Goal 3:

#### Defining Your Design Challenge

*Specifics of the KidsTeam Design Process*



What is the design problem your group wants to solve together?

Our Design Challenge is:

*Figure 6.* “Preparing the Design Specific Activities” section of “Worksheet.”

To round out this discussion, I want to make a note about the “Tips” I incorporated throughout Toolkit v.1. Participants suggested that offering a training and/or reflection with researchers could be beneficial. P2 brought up training several times throughout our discussion. They remarked on how it could be beneficial for the librarian facilitators in understanding the program:

[Have] a training for a couple hours...And then have the librarians build something themselves, have them do the workshop, because it’s a lot easier after you have done it yourself and you had the experience. (P2)

They went on to suggest that a training could be beneficial for KidsTeam researchers if they were looking for an opportunity to engage with a larger audience to promote KidsTeam (P2). P3 did not explicitly suggest a training, but they shared a similar

sentiment to P2's. They said that it may be beneficial to provide a space for the librarians to reflect with researchers to "talk about, 'What were the pros? What were the cons?'" of the program (P3). It seems like participants felt engagement with researchers would offer some confidence in understanding the program and facilitating it on their own.

While developing a KidsTeam training for librarians is outside of the scope of this research, I felt it important to address the sentiment behind such trainings. I interpreted participant's suggestions as wanting a space to collaboratively learn about the KidsTeam program and how to incorporate it into their library. It was this mentioning of training and reflection that led me to create "Tips" throughout Toolkit v.1. These Tips are a combination of best practices pulled from past experience working with KidsTeam to offer a sense of support as well as additional questions for them to consider and reflect upon while planning. While I am not positioning these "Tips" as a replacement for an in-person training, they were intentionally included in attempts to provide a space for reflection and some more pointed suggestions based on past KidsTeam experiences.

#### **Theme 4: Clarity through program specificity and desired outcomes or goals**

Table 6

*Toolkit v.1 and Walsh's KidsTeam Project Repository elements supported by Theme 4*

<b>Toolkit v.1 Elements</b>	<b>Walsh's KidsTeam Project Repository Elements</b>
Toolkit and Worksheet Purposes	Welcome!
KidsTeam Goals & Background	Manual Introduction
Selecting Your Activities and Questions of the Day	
KidsTeam Process and Phases, Outline and Specifics	Design Phases
Stages of the design process and phases (graphic)	Design Phases
Past Examples ("5 Phases...", "Activity Ideas..." and "Additional Resources" sections)	Design Phases; Additional Resources

As mentioned previously in Theme 1, participants recalled there being confusion around both the procedural and conceptual aspects of the Kidsteam program. This appeared to be the case for both librarians and child participants. For the former group, there wasn't a clear reason why there was confusion. But as I touched on in Theme 1, one

possible explanation is the role librarians played in the delivery of the program: support. While they were aware of the program and the general outline, they did not know all the specifics ahead of time. It appears that they were also learning about the program as they were co-facilitating. However, they described that they eventually understood the process.

Because of this, I included a concise introduction and background on KidsTeam at the beginning of Toolkit v.1, while providing links to more details in the “Additional Resources” section. In the “Welcome” section, I created a “Toolkit Purpose” and “Worksheet Purpose” as guidance for how these documents are supposed to be used in tandem. Then after the “Worksheet” section, Toolkit v.1 flows into “KidsTeam Goals and Background,” which serves as the introduction to the whole KidsTeam design process before diving into the specifics (see Figure 7 below). This section includes the “Goals” of the KidsTeam program. This information was synthesized from the academic literature and past KidsTeam work as I was not able to locate a specific list of goals. There is also a brief overview of Walsh’s adaptation of Druin’s KidsTeam model for public libraries as it is the impetus for this research and toolkit design.

## KidsTeam Goals & Background

### Goals of KidsTeam

Every KidsTeam program has their own set of goals but, they follow the same principal of collaboratively designing technologies for and with children. Below are the general goals of conducting KidsTeam programs:

1. Exploring where children fit into the design process, specifically as an opportunity for children and adults to be design partners (Druin, 1999)
2. "Co-design technologies that are more relevant to children's interest and needs" (*KidsTeam*, n.d.)

TBD: Pictures of past KidsTeam creations

*And specifically for conducting KidsTeam in public libraries*

TBD: Pictures of past KidsTeam creations

3. Include more diverse voices in the design process (Walsh, 2018)

### KidsTeam Background: Children and adults designing together

KidsTeam is a design process created by Dr. Allison Druin over 20 years ago in which children ages 7-11 and adults collaboratively design new technologies for and with children. She created the *cooperative inquiry* design approach which explored the different roles children can have in the design process, specifically as "research partners" (Druin, 1999). Her work in conjunction with the University of Maryland's Human Computer Interaction Lab (HCIL) resulted in an intergenerational design team where children and adults are *design and research partners* (*KidsTeam*, n.d.). They've worked with a variety of partners from Nickelodeon to the National Parks Service (*KidsTeam*, n.d.). Check out the **Additional Resources** section for more background on their work and other KidsTeam initiatives around the USA.

### KidsTeam in Public Libraries: Adapting the process for libraries

Recognizing an opportunity to conduct the KidsTeam design process in the community, Dr. Greg Walsh of University of Baltimore brought KidsTeam to public libraries in Baltimore City. However, he adapted the process format, specifically reducing the length of the design process from months to weeks in hopes of including more diverse voices in the design process (Walsh, 2018). This toolkit is an adaptation of his original manual he created for public library librarians to use if they wanted to conduct KidsTeam design programs on their own.

*Figure 7.* The "KidsTeam Goals and Background" aims to give context and structure to the KidsTeam program before librarians engage more deeply with Toolkit v.1's contents.

Through Stage 1's interviews, I also gained some more insight as to why the children participants may have experienced confusion. As mentioned earlier, participants acknowledged that the varied child participation in their KidsTeam programs could have contributed to this confusion (refer back to Theme 3's discussion for more context). Participants expressed additional reasons. When asked if they felt that everyone knew what they were supposed to be doing during their KidsTeam session, P1 recalled:

Not by the end of the first session. I didn't quite understand it until a little later when I could start to see what they were doing, what they were producing. And I'm not sure the participants quite understood it all the way. There was a bit of an age range but, there were a few older children, I don't think it was 100% across the board, "I know what this is and why we are doing it." (P1)

P3 had a similar experience. They noted that while some of the ideas were difficult for the children participants to understand, that's not necessarily a negative:

In some cases, it was over their heads but, that's ok, you know? As long as they got something, they were able to begin to see something's about it. If you don't challenge them, then to me, you're not really doing any favors when you don't challenge them. (P3)

As referenced earlier in Theme 1, P2 felt some of the conceptual and procedural confusion of the design activities came from the length of time between sessions: "Yeah, you're thinking about tomorrow, you're thinking about right now. [The children participants] are not putting forward what it's going to be like in a week" (P2).

From this information, I posit that some clarity around both KidsTeam procedures (i.e. What are we doing over the four weeks? What are we doing each week?) and concepts (What are we trying to achieve through this design process? How do the activities connect together?) would mitigate some of the confusion on behalf of the child participants. With that, I anticipate that having clear information on these procedures would also foster more confidence in librarians when facilitating and teaching the process

to their youth patrons. P1, as referenced earlier, made a suggestion for providing more clarity that echoes P2's observations:

...having just kind of a quick tutorial activity with a start to finish that the kids could touch, to help them understand what they would be doing because it's hard to conceptualize what the next task was going to be a full seven days from then and then to have to remember that knowledge and have to act on it the following week. (P1)

These findings further the choice to include 4 sections in Toolkit v.1 that give overviews and outlines of the specifics of both the 3 Design Stages and 5 Phases. See Appendix C to view these sections in full. As mentioned earlier, I also created visual representations of this information. For visuals, refer back to Figures 2 and 3 in Theme 1.

Another aspect of program specificity I noticed was in the participants' discussions around the design activities themselves. This is similar to the discussion in Theme 1 around providing more details about design concepts. However, I find that it is pertinent in this discussion as well given my data analysis revealed that more clarity in these instructions could help in understanding the entire program and its outcomes. Some participants expressed a desire for more specific and detailed instructions both for their own understanding and that of the child co-designers. P1 remarked that in order to feel prepared each week, they'd benefit from "a description of the activity and any specific instructions on how to achieve it" (P1). They also suggested that incorporating "...some place to go or books to look at so that if [they were] demonstrating something that was outside of [their] knowledge zone...[they] could make sure that [they were] demonstrating it correctly and accurately" (P1).

P2 expressed that examples within the toolkit should not be *too* specific when it comes to the design activities as it could stray away from the open-ended nature of KidsTeam. In regard to child participation, they put it this way: "...if you put up a coloring sheet of a cat and you color your cat black; they are going to color all their cats black. They just mimic it" (P2). I interpreted this as the specificity of prior examples

could create a rigidity that won't encourage a child to freely create but, rather, they'll be tempted to just mimic the example. P3 also mentioned offering a wide variety of sample ideas but for a different reason. They felt that this would "...make [the toolkit] for more librarians not just the science-orientated librarians" (P3). They went on to say that it would be beneficial to "...[have] some samples of things other than just science based...Because it's not science as much as it is creativity" (P3).

Without having a clear consensus on the level of granularity of specifics that may help librarians when it comes to the design activities, the "Activity Ideas for Phase 3: Design Time" section of Toolkit v.1 and the "Selecting Your Activities and Questions of the Day" portion of the "Worksheet" are designed to work in tandem. "Activity Ideas" provides synthesized information based on past KidsTeam work regarding potential activities librarians can use during the different design stages. This section also points users to the "Additional Resources" section which provides links to additional KidsTeam examples and includes detailed descriptions of previous design techniques and activities used (this is adapted from Walsh's KidsTeam Project Repository). See Figure 8 below for a visual. Note that this section in Toolkit v.1 spans over two pages. I've noted the page break in between images.

### Activity Ideas for Phase 3: Design Time

The supplies you choose may vary slightly depending on the design activity that you select for each program session. There are endless activities you can choose from and will likely depend on what your design challenge is and what stage of the design process you are in.

Below are just some examples KidsTeams and researchers designing with children have used in the past. They are examples taken from Co-designing a Digital Library (Druin et al., 2009) and the

*(Page break)*

Octocrat paper on intergenerational participatory design techniques (Walsh et al., 2013). I've organized them by the Design Stage they can be applied to:

#### Generate

- Observe and conduct interviews
- ComicBoarding
- Big Paper
- Sketching/drawing
- Mixing Ideas (for younger groups, aged 5 - 6)

TBD: Images of select activities

#### Iterate

- Stickies – Likes, Dislikes and Design Ideas
- Storyboarding

TBD: Images of select activities

#### Evaluate

- Full group discussion session
- Conduct interviews

**Tip:** No matter what activity you choose, it is important to remember a key tenet of children and adults designing together: *idea elaboration*. "This is when one team member (adult or child) shares an idea with the team and it is extended by others... What matters is that both adults and children share in the process together" (Druin et al., 2009).

Refer to the **Additional Resources** section below for activity specifics, techniques and more examples.

### Additional Resources

Here is a shortlist of additional resources, broken down by category, to help supplement the information in this Toolkit.

*Figure 8.* Toolkit v.1's "Activity Ideas for Phase 3: Design Time" synthesizes information from past KidsTeam work into examples of activities librarians can use throughout the three design stages.

Then, in “Selecting Your Activities and Questions of the Day,” librarians are able to plan out their activities ahead of time if they choose. The “Tip” at the bottom also prompts them to think about past library programs in addition to using Toolkit v.1’s “Activity Ideas” section for inspiration. See Figure 9 below for a visual. By providing options for librarians to engage in the material at the level of specificity that they desire, Toolkit v.1 offers librarians flexibility for finding information and multiple avenues for engaging in specific aspects of information as they see fit.

Refer to the Toolkit’s section on *Activity Ideas*, brainstorm some ideas for activities and a question you can ask the group that’s similar to the design topic:

Design Stage	Design Challenge Activity	Question of the Day
 Generate		
 Iterate		
 Evaluate		

**TIP:** It may help to think of past library program activities you’ve led that were engaging. Do any of them fit into the 3 Design Stages?

*Figure 9.* The chart in “Selecting Your Activities and Questions of the Day” allows for librarians to brainstorm their own activities for the 3 Design Stages.

A final note on language and design-specific terminology in the Toolkit and Worksheet. In Toolkit v.1, I altered the language of the design sessions to reflect the terminology that I heard librarians use when referring to programs throughout the interviews. So instead of using the term “Design Session” exclusively when referring to the individual design sessions for KidsTeam, as is common in the literature and in

Walsh's KidsTeam Project Repository, I refer to them as "Design Session Programs." I anticipate that this language shift could help with the procedural and conceptual confusion. Through the usability assessment, I hoped to glean more insight into what terminology to use that bridges design verbiage with library terminology.

### **Impact of Toolkit v.1 Design Choices on Stage 3's Research Design**

During the process of thematic analysis and creating the Toolkit v.1 design artifact, I was formulating the research design for Stage 3. I discovered that there were three key areas of Toolkit v.1 I wanted to address throughout Stage 3: (1) Structure & Content; (2) Style & Presentation; and (3) Distribution Format. From the collective findings and design decisions from Stage 1 and 2, I decided to conduct a two-part interview for Stage 3 in which I assessed and evaluated Toolkit v.1. I explore each of the three toolkit areas below and how they reflect certain aspects of Stage 3's research design.

#### **Structure and Content**

As revealed in the previous section, elements of the structure and content of Toolkit v.1 are based on my interpretation of the data collected from the interviews and additional research, in conjunction with Walsh's KidsTeam Project Repository. Through the process of transforming my thematic analysis into tangible toolkit design elements, I was simultaneously creating the toolkit's overall structure and content. Toolkit v.1 has 6 distinct sections with sub-sections. Figure 10 below shows the final Table of Contents which provides an overview of Toolkit v.1's structure and content. See Appendix C for the Toolkit v.1 design artifact in its entirety.

<b>Toolkit Table of Contents</b>
----------------------------------

<b>Welcome .....</b>	<b>2</b>
<b>Toolkit Purpose.....</b>	<b>2</b>
<b>Worksheet Purpose .....</b>	<b>2</b>
<b>Worksheet: Create Your Own KidsTeam Program .....</b>	<b>3</b>
<b>Planning Your Program Timeline .....</b>	<b>3</b>
Desired Date(s) and Time(s) of KidsTeam Program(s): .....	3
Programming Planning Chart.....	3
<b>Preparing the Design Specific Activities .....</b>	<b>4</b>
Goals for My KidsTeam Program .....	4
Defining Your Design Challenge .....	4
<b>Specifics of the KidsTeam Design Process .....</b>	<b>4</b>
Selecting Your Activities and Questions of the Day .....	4
<b>Outlining the Specifics for Each Individual Program Session .....</b>	<b>5</b>
<b>KidsTeam Goals &amp; Background .....</b>	<b>7</b>
Goals of KidsTeam .....	7
KidsTeam Background: Children and adults designing together.....	7
KidsTeam in Public Libraries: Adapting the process for libraries .....	7
<b>KidsTeam Format: The specifics of the design process.....</b>	<b>8</b>
Overview of the KidsTeam Design Process .....	8
Specifics of the KidsTeam Design Process .....	9
Overview of the 5 Phases of an Individual Design Program Session.....	10
Specifics of the 5 Phases of an Individual Design Program Session.....	10
<b>Planning Your KidsTeam Process: Best practices .....</b>	<b>13</b>
Scheduling a Time for Your Program Sessions .....	13
Planning for Varied Participation .....	14
Recommended Program Session Length.....	14
Preparation for Each Individual Design Program Session .....	14
Setting up Your Design Space .....	14
Supplies List .....	15
Activity Ideas for Phase 3: Design Time .....	15
<b>Additional Resources .....</b>	<b>16</b>
Background on KidsTeam and Designing Technology with and for Children.....	16
KidsTeam Examples .....	16
Activity Ideas and Design Techniques.....	17
<b>Bibliography.....</b>	<b>17</b>

Figure 10. Toolkit v.1 Table of Contents.

Since Toolkit v.1 is meant to be an actionable resource for librarians who wish to use Walsh's refined KidsTeam model, much of the content for Toolkit v.1 came directly from Walsh's KidsTeam Project Repository, which is licensed under a Creative Commons Attribution-ShareAlike 4.0 license, and is cited within Toolkit v.1 as such

(Walsh, 2018/2020). My data analysis revealed that much of the project repository's current contents were in line with the themes that I discovered. Toolkit v.1 iterates upon the project repository's four sections: (1) README; (2) Additional Resources; (3) Manual and (4) Worksheet. Refer back to Table 2 for details.

One example of Toolkit v.1's usage of Walsh's KidsTeam Project Repository is Walsh's "Design Sessions" section. This explains the 5 Phases of the design process in intricate detail, interweaving practical advice with past examples from previous KidsTeam design sessions (Walsh, 2018/2020). The content and structure of this section was in line with Theme 4: *Clarity through program specificity and desired outcomes or goals*. Thus, I kept the content of the 5 Phases the same and added stylistic elements (i.e. headers, suggested timing and goals) to emphasize key pieces of information that from my data analysis I interpreted as critical for the understanding and utilization of the toolkit by librarians.

Another element of Toolkit v.1 that was pulled directly from the project repository was the "KidsTeam Session Planning Worksheet" which I re-labeled as "KidsTeam Program Session Template" in Toolkit v.1 (see Figures 11 below). In the toolkit, this template is the last element of the "Worksheet" section. It is positioned as a day-of planning worksheet for each design session, much in the same way as Walsh had likely intended.

### KidsTeam Program Session Template

This template is meant to be used for each of the individual program sessions. Since one session builds off the other, it will be helpful to fill out this template *after* you complete a program session in preparation for the next one. *Please note: The below is directly from Walsh's original KidsTeam manual (Walsh, 2018/2020).*

#### Topic

What is the overall design challenge you are trying to solve?  
What is the focus of this design session?

#### Space & Time

How much time is available for KidsTeam?  
Do you have a table for snacks?  
Do you have a place for circle time?  
Do you have a place for design time?  
Do you have a place and equipment for Big Ideas?

#### Snack Time

Are there any known dietary restrictions? Yes No  
Write the snacks you are planning to have at the KidsTeam session.

#### Circle Time

Think about the design session's focus. What will be your question of the day?

#### Design Time

Do you want this design session to be generative (new ideas), iterative (add to ideas), or evaluative (review prototyped ideas)?  
What activity or technique will you use?  
What supplies do you need?

#### Big Ideas

Where will you collect the Big Ideas (whiteboard, flip board, poster paper)?

**Tip:** It may help to make multiple copies of this sheet based on the number of program sessions you plan to host.

*Figure 11.* Toolkit v.1's "KidsTeam Program Session Template."

However, I chose to further contextualize this document into a more robust “Worksheet” section which includes other elements such as “Planning Your Program Timeline” and “Preparing the Design Specific Activities.” I did this given Theme 2 of my data analysis: *Providing resources to help with advanced planning and preparation.* I found that the day-of planning sheet could supplement the other planning worksheets that focus on advanced preparation for KidsTeam programs as participants expressed is of importance. In order to assess how librarians would interact with these elements, I included 2 tasks in the usability assessment focused on planning:

Task 1: *With 3 months before the program, you want to start planning out your timeline for the design sessions. Can you show me where you would look to find that information to start planning your timeline?*

Task 7: *Finally, you just completed your third program session! The children came up with some great prototypes. Now you’re preparing for your last program session in which the group will evaluate their creations together. How would you use the toolkit to plan for your final program session?*

While my data analysis supported the design choice to incorporate Walsh’s worksheet to supplement these other planning resources, my analysis was inconclusive about the optimal format for the newly named “KidsTeam Program Session Template.” Thus, I inserted Walsh’s worksheet verbatim in Toolkit v.1 with the intent of asking pointed questions about its format and potential usage during Stage 3’s interviews. I asked questions in the usability assessment’s follow-up interview in attempts to glean more information about the format and let the data drive the final design:

*Do think that you would use the KidsTeam Program Session Template in the worksheet in preparation for each individual program session?*

- a. *Do you think this format will be helpful?*
- b. *If not, what information do you think would be helpful to have from program session to program session to help with planning?*

### **Style and Presentation**

Style and presentation refer to the toolkit's stylistic elements, such as font, graphics, headers, etc. and how they are collectively presented in attempts to create a cohesive toolkit. Originally, the primary focus of Toolkit v.1 was on the main sections of the toolkit, high level concepts and the flow of information from section to section. Thus, I created a "mixed-fidelity" prototype (McCurdy et al., 2006). I kept the visual elements relatively low-fidelity as to not distract participants away from the content and flow of information as McCurdy et al. references research supporting sketching interfaces in the earlier stages of prototype development (Landay & Myers, 2001). I planned on refraining from stylizing it fully so the focus of Toolkit v.1 would remain on the skeletal structure and flow of information. However, through my data analysis, I found that there were certain stylistic elements that would help in the findability of and interpretation of the toolkit's information. Thus, I did stylize select elements as they would help the participants not only find but, also interpret the toolkit's information (i.e. headers, sub headers and some figures). I thought this was especially pertinent given a user's ability to utilize the toolkit is not only determined by if they can find the information, they are looking for but, if it is actionable within the context of planning and facilitating a KidsTeam program. This became a guiding sentiment as I planned Stage 3's usability assessment and follow up questions.

An example of stylized elements used to assist with information finding and interpretation was how I chose to differentiate between sections and sub-sections of information. Throughout the design process, I was utilizing color headers and sub headers as a way to differentiate between chunks of text. However, my color choices were not in high contrast nor were they complementary which is in conflict with accessibility guidelines for web-based information (Horton & Queensbery, 2013). See Figure 12 for an example of my original color choices.

## KidsTeam Goals & Background

### Goals of KidsTeam

#### Planning Your Program Timeline

When planning your program(s), you'll need to decide how many individual program sessions you will have and how much time in between each program. Past KidsTeam work in libraries have done a **weekly format with 4-5 individual program sessions total.**

#### Desired Date(s) and Time(s) of KidsTeam Program(s):

*Figure 12.* Color coded headers and sub headers used in Toolkit v.1 formation.

I referred to *A Web for Everyone: Designing Accessible User Experiences* (Horton & Queensbery, 2013) for guidance on how to refine the style and presentation for greater accessibility. With that, I redesigned the headers in high contrast using black and white and borders (Horton & Queensbery, 2013, p. 115). Below are examples of the final headers used. The first (Figure 13) is an example of the headers used throughout Toolkit v.1. I added a border to each of the headers to create a clear distinction between header information and other bolded information used throughout the text sections of the toolkit.

## KidsTeam Goals & Background

### Goals of KidsTeam

*Figure 13.* Example of Toolkit v.1's high contrast headers and sub headers.

Since the "Worksheet" section is embedded into the larger toolkit, I wanted to create a clear distinction between the two. Thus, I reversed the colors, using white text on a black background as is shown in Figure 14.

### Planning Your Program Timeline

When planning your program(s), you'll need to decide how many individual program sessions you will have and how much time in between each program. Past KidsTeam work in libraries have done a weekly format with 4-5 individual program sessions total.

Desired Date(s) and Time(s) of KidsTeam Program(s):

*Figure 14.* Example of high contrast headers and sub headers found throughout “Worksheet.”

Implementing these stylistic elements was challenging as I had to balance choosing elements that would be clear indicators of information while not stylizing the toolkit to its fullest capacity.

While the headers and sub headers are minimally stylized, there are elements that are in much higher fidelity. Specifically, the graphics explaining the design process (reference Figures 2 and 3), were intentionally included as my data analysis led me to believe that this visual format of the KidsTeam process and the individual 5 Phases could increase findability and interpretation of the information. Aspects of both these images are present throughout Toolkit v.1 to reinforce the ideas and concepts each figure visually represents as well as to assist in the wayfinding of information throughout Toolkit v.1. Figure 15 below provides an example of how the headings for each of the 5 Phases in Toolkit v.1’s section “Specifics of the 5 Phases of an Individual Design Program Session” uses pieces of the visual from the 5 Phases Overview image in the earlier referenced Figure 3. Each section of the 5 Phases follows this visual structure.

## 1 Snack Time

15 min

### Snacks

"Snack time is the first phase of the KidsTeam design process. During this time, the entire design team **(children and adults) participate by eating the snacks**. When choosing snacks, it's important to understand the cultural dietary restrictions for your area as well as any special needs indicated by participants before the design sessions began. Popcorn is an excellent snack because it contains no dairy, is vegan, and has no sugar beyond those naturally occurring in the food. We've had good luck with applesauce, goldfish crackers, Saltines, and granola bars. The easiest drink to serve is water. We've found that children that participate in these design sessions are aware of the environmental damage that plastic plays, so, we suggest you use paper cups and large containers of water or perhaps filtered water from a pitcher.

**Before your design team arrives, it is important to set up for snack time.** It has been shown that children and adults perform better when they are not hungry. This is one of two reasons we have snack time as part of KidsTeam. Besides feeding the design team, Snack time works as a way to level the power dynamic that both the children and adults are accustomed to especially if the design session is held after school." (Walsh, 2018/2020).

## 2 Circle Time

15 min

### Question of the Day; Introductions

"After about 15 minutes of snack time, it is time for circle time to begin. Much like snack time having two uses, circle time also performs two tasks: **continuing to break down power structures**, and **focusing the discussion on the design problem at hand**.

*Figure 15.* Example of "5 Phases..." header format.

One of my goals for the usability assessment of Toolkit v.1 was to gain a better understanding of how the stylized elements assisted or hindered the findability of information in the context of how the toolkit will be used. Thus, I planned to keep note of how participants engaged with these elements during the usability assessment. Specifically, I was looking for if, and or how, participants used the Table of Contents, headers/sub headers and the graphics during the tasks. I also split Task 2 into three parts in which I asked participants to find specific information about the Design Stages and Phases:

*Task 2A: Next, you're trying to decide how many individual program sessions you want to have. Where would you find information on the different Design Stages?*

Task 2B: *You're looking to learn more about the Design Stage that focuses on "creating a lot of different ideas." Where can you find more details about this stage?*

Task 2C: *In order to create your own program based on the 3 Design Stages, there is a key preparation step. Where can you find more information about this step?*

The answer to these tasks could be found both in the text and graphics. I made sure to note which one(s) participants identified. Additionally, I created two specific questions in the follow-up interview around style to ask to establish more clarity regarding the headers:

1. *Were the headings and subheadings helpful in finding the information you were looking for? If not, what would have made it clearer?*
2. *Were you expecting specific information to be highlighted that wasn't?*

From the answer to the second question, I hoped to better understand if any information was hidden within the text or was not included that participants felt they needed. This would then give me more clarity around potential ways to leverage stylistic elements in Toolkit v.2 to assist in the findability of information.

### **Distribution Format**

Finally, I want to address Toolkit v.1's overall format. I designed Toolkit v.1 as a paper-based online interactive prototype. This supports the primary research goal of creating a toolkit that will be accessible online as a downloadable PDF or can be read directly online. In order to get direct feedback on this design decision, I asked specific questions about format distribution during the evaluation of Toolkit v.1 in Stage 3:

1. *What format is best for utilizing this toolkit? One large file or separate files?*
2. *Should the Worksheet be separate from the Toolkit?*

Given I didn't have any conclusive data from Stage 1 regarding format, it was essential for me to ask these questions in Stage 3. This was in line with my overall design

approach in which the data drives the design and design recommendations for Toolkit v.2.

### **Stage 3: Assessment and Evaluation of Toolkit v.1**

The goal of the third stage was to assess and evaluate the findability of information in Toolkit v.1. More broadly, I wanted to get a sense of how specific toolkit elements could help librarians confidently facilitate KidsTeam programs in their libraries on their own. Out of creating Toolkit v.1, I recognized some gaps in my understanding of how librarians would practically engage with a toolkit of this nature. Thus, I designed my second interview to include a usability assessment of the toolkit prototype followed by interview questions about specific sections of the toolkit. Given restrictions on conducting in-person research at the time of this study due to the COVID-19 pandemic, I conducted the usability assessment and open-ended interviews over Zoom; each participant consented to be audio and video recorded for data analysis purposes. I sent each of the participants a PDF email attachment of Toolkit v.1 roughly 48-hours in advance so that they had time to read through it and reflect on their past experience with KidsTeam prior to the interview.

During the interview, each participant shared their screen via Zoom with Toolkit v.1 visible. I first had each participant go through a series of usability tasks to assess the findability of information in the toolkit. I explained to them that I was assessing the toolkit, not them, as the goal of the usability assessment was to better understand and assess the findability of information in the toolkit. I presented them with two scenarios over the course of 11 tasks. Two of these tasks (Task 2 and 3) had 3 parts and Task 7 was exploratory and was not awarded a numerical value. See Appendix D for a full list of the usability assessment questions. Thus, there are a total of 10 tasks that were given a numerical value based on the participant completing the task successfully (10), partially (5) or not successfully (0), with a maximum value of 100. I filled in the usability assessment completion chart as they completed each task. See Table 7 below for participant results.

Table 7

*Stage 3: Individual Participant Usability Assessment Results*

<b>Task</b>	<b>1</b>	<b>2A</b>	<b>2B</b>	<b>2C</b>	<b>3A</b>	<b>3B</b>	<b>3C</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>Total</b>	<b>%</b>
<b>P1</b>	S 10	NS 0	P 5	S 10	S 10	S 10	S 10	S 10	NS 0	S 10	N/A	75/100	75%
<b>P2</b>	P 5	S 10	S 10	S 10	S 10	S 10	S 10	S 10	S 10	S 10	N/A	95/100	95%
<b>P3</b>	S 10	S 10	NS 0	S 10	S 10	S 10	S 10	S 10	S 10	S 10	N/A	90/100	90%

*LEGEND*

*S = Success: Participant completed the task successfully*

*S = 10*

*NS = Not Successful: Participant did not complete the task successfully*

*NS = 0*

*P = Partial Success: Participant was able to complete part of the task but, was not fully*

*P = 5*

Given the exploratory nature of this study and with such a small sample size, I chose not to calculate and run statistical analysis on usability assessment success rate across participants. Refer to the Conclusion for discussion on the limitations of this study and plans for future research.

The 11 tasks were presented in a loose chronological order of the steps an individual would take to plan, implement and lead a KidsTeam program. The first scenario pertained to Tasks 1 – 4. It focused on advanced program planning procedures as I learned from Stage 1 that it is common for librarians to plan their programming several months in advance.

*Scenario 1: You are interested in hosting a KidsTeam program with your youth library patrons at your library. Your library staff wants to design a new virtual*

*STEAM program geared towards 7-11 year olds. It is 3 months before your desired program date. You open the toolkit to prepare.*

This first set of tasks had the lowest completion rates with four of the five instances of NS or P occurring in Tasks 1 – 2B. Task 1 asked participants:

*With 3 months before the program, you want to start planning out your timeline for the design sessions. Can you show me where you would look to find that information to start planning your timeline?*

P1 and P3 both utilized the Table of Contents and identified the correct location - “Planning Your Program Timeline” in the “Worksheet.” In contrast, P2 was looking for where they would plan specific activities for their design sessions. They located the “Program Session Template,” which I considered a partial success as it can be used for planning an individual session, but it is not originally intended for planning multiple sessions at once.

Task 2A also created some confusion. The task asked:

*Next, you’re trying to decide how many individual program sessions you want to have. Where would you find information on the different Design Stages?*

The correct location(s) were in the “Overview of the KidsTeam Design Process” as well as the following section on the specifics of the design process, which both have information on the three design stages. P2 and P3 correctly identified those sections, both landing on the “KidsTeam Process for Multi-Week Programs” graphic which outlines the three design stages (reference Figure 8). P2 noted how they would also refer to the “Worksheet” sections where the Design Stage graphics also appear, specifically the “Selecting Your Activities and Questions of the Day” graphic (Figure 16 below) and the subsequent activity ideas chart (reference Figure 9).

### Selecting Your Activities and Questions of the Day

Next, it may be helpful to brainstorm potential Design Time Activities and Questions of the Day that you can use in your individual design program sessions. Each of the Design Time Activities should reflect the Design Stage they are associated with.

Below are the three Design Stages:

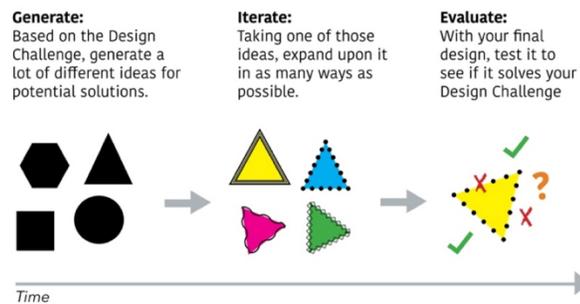


Figure 1: 3 Stages of the KidsTeam Design Process

Figure 16. “Selecting Your Activities and Questions of the Day” graphic.

P1 however was looking for the “flowchart” about the 5 phases of a design session. They said, “I would start with the flowchart because it just gives me an idea of how much time actually would be spent in each session doing designing” (P1). It appears there was some confusion about the term “Design Stage” in the question as P1 settled on the 5 individual phases within each design stage instead of the stages themselves.

Task 2B asked participants to find some specific information about one of the Design Stages. I asked this question as my results from Stage 1 revealed that there was some confusion around the differences between the Design Stages and Design Phases. I wanted to see if incorporating the specific information in graphic and text forms would help with findability. Task 2B asked:

*You’re looking to learn more about the Design Stage that focuses on “creating a lot of different ideas.” Where can you find more details about this stage?*

P2 was the only participant to correctly identify “Generate” as the correct stage and navigated to the section “Specifics of the KidsTeam Design Process” which outlines each of the three stages. While P1 also identified the correct location to find this information, I

considered it a partial success because they incorrectly identified the design stage as “Iterate” instead of “Generate.” In contrast, P3 remarked how they weren’t sure exactly what they were looking for and ended the task without identifying a specific location in the toolkit. They were looking for what they called “key words” from the question in both the Table of Contents and the headers throughout Toolkit v.1. It appears there was some confusion around the specifics of the question that I asked as they were focused on finding information about “ideas” and “activities” rather than the Design Stage that focuses on “creating a lot of different ideas.” All participants successfully completed the remainder of the tasks for the first scenario (Task 2C – Task 4).

We then moved into the second scenario which aimed to gain a better understanding of how participants would use Toolkit v.1 when planning just a week before the program start date:

*Scenario 2: Now imagine it’s a week before your first program session, you want to plan out exactly what you need to have prepared.*

Tasks 5 and 6 addressed areas of the toolkit that would have information regarding past KidsTeam examples and potential activity ideas. Stage 1 & 2’s data analysis posited that these sections would help address two of the key themes: (2) Providing resources to help with advanced planning and preparation and (4) Clarity through program specificity and desired outcomes or goals. Task 5 read:

*You think referring to past examples of KidsTeam work or examples of how a program session runs in full may be helpful. What section(s) of the toolkit/worksheet would you use to find this information?*

While P2 and P3 completed Task 5 successfully, P1 was not able to find what they were looking for. P1 recalled seeing the information but couldn’t remember where it was, so they went back to the TOC. They were unable to find what they were looking for, stating, “I feel like I’ve seen bits of that information across several sections [but] for some reason I can’t quite place it in one” (P1). They then settled on the “Worksheet,” saying they would “just look at the worksheet to just get some mental bearing on that week before

and kind of visual[ize] how that first session would go” (P1). However, none of the participants located Walsh’s article, “Anatomy of a Design Session” (Walsh, 2013), that was included in the “Tips” section at the end of “Specifics of the 5 Phases of an Individual Design Program Session” (see Figure 17 below). This article offers an example of an entire KidsTeam session.

## 5 Clean Up

5 – 10 min

### Cleaning and Organizing

“This is not an important phase when it comes to the design session, but it is very important when it comes to keeping the space clean. It is helpful to have all of the designers help clean up the space including the art supplies, sticky notes, large pieces of paper, crayons or markers. Space at this time is also extremely helpful to cleanup food or drinks snack time and make sure the space is clean for the next users of that room” (Walsh, 2018/2020).

### Tips:

1. To see an example of how the whole process works in action, take a look at Dr. Greg Walsh’s article describing the anatomy of a KidsTeam design session:  
<https://mdsoar.org/bitstream/handle/11603/7853/Anatomy%20of%20a%20Design.pdf?sequence=1&isAllowed=y>
2. After each program session, it may be helpful to spend time reflecting on both the concepts discussed and the process. Ask yourself: What went well? What needs adjusting? Is there something the group really enjoyed?

*Figure 17. “Tips” linking to Walsh’s article “Anatomy of a Design Session.”*

Each participant completed Task 6 successfully, which asked participants to locate the section where they’d find “activity examples.” P2 and P3 correctly identified the “Activity Ideas and Design Techniques” section of the toolkit. P1 navigated to the other correct location: “Activity Ideas for Phase 3: Design Time.”

I concluded the usability assessment with an exploratory question to get a sense for how participants would use the toolkit to plan their last session:

*Finally, you just completed your third program session! The children came up with some great prototypes. Now you’re preparing for your last program session*

*in which the group will evaluate their creations together. How would you use the toolkit to plan for your final program session?*

I included this question without awarding a numerical value to indicate success as presumably there are several ways in which a librarian can utilize the toolkit to plan their last program. The toolkit's overall design is heavily rooted in this core concept. And while the other tasks address specific pieces of information, I wanted to use Question 7 as a means for understanding how the toolkit's design actualized Theme 3 from Stage 1: *Ability to tailor the KidsTeam program to youth patron's and librarian's needs and goals, taking into consideration the limitations for both.*

The results were more inconclusive than I had anticipated. P2 wasn't exactly sure what they were supposed to be looking for and did not provide a direct answer. It appears that they interpreted my question to have a specific answer or location as the other questions had. The other two participants had very different approaches. P1 started by looking for information on the "Evaluation" stage and said they would focus on this portion for planning the last program. P3 explained how they wanted to use the last program to not only evaluate the prototypes from their design session but, also to evaluate the program as a whole.

At the conclusion of the usability assessment, I then asked each participant a series of questions around specific aspects of the toolkit to get their perspective. There were four topics of discussion: (1) First impressions of Toolkit v.1 and content; (2) Structure and organization; (3) The Worksheet and Template sections; and (4) Distribution methods. See Appendix F for a full list of interview questions. These questions were specific and less exploratory. Thus, I did not code this set of data with a second researcher. I analyzed and synthesized the participant responses, noting similarities and key differences. The main findings from each section are outlined below.

### **First Impressions of Toolkit v.1 and Content**

Overall, first impressions of the toolkit were positive. When asked, "How confident do you feel in using this toolkit to facilitate a KidsTeam program? '1' being not

confident – ‘5’ being very confident,” two participants (P2 & P3) rated their confidence level at a “5.” P2 followed up that response with a caveat that for those who have never facilitated a KidsTeam program before, a “concrete examples would be useful...so that they understand an example of the full process” (P2). They expressed that while the design process is meant to be open-ended, “sometimes open-ended can mean way too open... [a concrete example] helps narrow the scope a little” (P2). P1 ranked their confidence at a “3,” noting that “the 4s and 5s would just be dependent on how many kids [they] could get and how active [the kids] were in the planning process” (P1). The researcher asked a follow-up question about whether the participant felt the toolkit would help them facilitate programs if they had the participation they wanted, P1 expressed that the toolkit would be helpful in facilitating KidsTeam programs.

Other first impressions of note were participants’ reactions to the Table of Contents (TOC). While during the usability assessment each participant referenced and utilized the TOC in a myriad of ways, P2 and P3 both remarked how the TOC was difficult to digest. P2 said, “...it doesn’t feel like there’s any breathing space on the page...all the words are right next together, so you don’t read any of them” (P2). P3 expressed a similar sentiment, remarking how when they opened up the Toolkit, “I thought, ‘Wow that’s a long Table of Contents.’ I didn’t even read it, I just looked at the way it was set up on the screen and the screen was full, full of writing” (P3). P1 didn’t mention the TOC or their thoughts on it explicitly. However, their first impression comments echoed P2’s earlier sentiments about the usefulness of a “sample program” and its helpfulness in understanding the contents of the toolkit. Specifically, they mentioned how weaving examples from past programs would help someone who had no experience with KidsTeam and a “concrete example” would “help give a shape to [the program]” (P1).

### **Structure and Organization**

In regard to Toolkit v.1’s structure and organization, participants chose to focus on different aspects of Toolkit v.1. P1 was the most vocal regarding the “flow” of the

toolkit. They felt that there were “gaps” in the flow and that “[they] kind of had to keep going back and forth between a couple of pages just to kind of get [planning] information together” (P1). Specifically, they mentioned how “all the ‘Planning KidsTeam Process: Best practices...’ should have been interspersed with the specifics of the design process” (P1). This discussion then flowed into their interpretation of the headers and sub-headers and how these didn’t always meet their expectations. P1 was surprised to see that the “Best practices” section contained research and practical tips and would have preferred to have “all the practical stuff grouped together so that [they] don’t have to keep going back and forth” (P1). P2 also commented about some pieces feeling out of order. They noted how they felt Toolkit v.1 was missing a clear introduction about the program and instead felt that it “sort of jumped right into it and you didn’t really know what was going on” (P2). And while they note that they got some of that background information in the “Additional Resources” at the end, they think it would have been more useful in the beginning (P2).

P3’s comments were focused on the interplay of graphics and text and how to access the information quickly. They made the suggestion of a “cheat sheet,” especially when leading a program:

When you got a program going on and a bunch of people asking you questions, and you got kids coming in and you’re trying to plan this program...it’s nice once you’ve gone over [the Toolkit] to have something fast and you can say, ‘Have I done this? Have I done this?’ This is your checklist, or this is how to do this. (P3)

When I asked if they felt the “Program Session Template” could fill that need, they remarked how it would be helpful, but they hadn’t seen it earlier during the usability assessment. They remarked, “it’s all writing and it has a little bit of bolding in there but it’s all writing” and suggested instead, “mak[ing] it in the form of a chart or something so that people would notice that it’s different” (P3). More on participant’s reflections on the “Worksheet” and “Template” portions of Toolkit v.1 will be included in the next section.

P3's remarks of needing to find information quickly during a program was echoed by other participants as well. When discussing the "Worksheet" and the other toolkit sections in relation to one another, P1 noted the "blocked structure" of the headers and sub headers: "[the headers] felt very distinct...which makes it easier to look at when I'm in front of kids I'm just like, 'What am I doing? What am I looking at?'" (P1).

### **The Worksheet and Template Sections**

There were several comments about the interplay between the "Worksheet" sections and the remainder of Toolkit v.1. P1 and P2 made comments about keeping the worksheet information lean and letting the rest of the Toolkit v.1 fill in any informational gaps. P2 found that the "Worksheet" had just enough information and adding any more would make it "clunky" (P2). In contrast, P1 said they expected the "Worksheet" "to be one page and then it took place across three pages. And that would feel like three separate planning documents" to them (P1). They further explained that they felt the "Worksheet" should not contain repetitive information that's found in the Toolkit v.1: "My expectation is, 'Here is the worksheet, this is what you are going to use practically and later in the document you will see sections that explain this part of it'" (P1).

In addition to P3's comments mentioned above about the hidden nature of the "KidsTeam Program Session Template," P3 re-emphasized how graphics are helpful when understanding the information presented, remarking how in regard to the "Worksheet" they are "all about the design and the color" (P3). P1 shared a similar sentiment regarding the utility of the "KidsTeam Program Session Template" noting that the format "felt like a list of questions to think about rather than something to write down...it doesn't feel interactive in that sense" (P1). However, they said they would keep it as a "question sheet...because [they] don't necessarily need to devote written space to some of these questions" (P1).

### **Distribution Methods**

Each participant suggested a different format for distribution, but had similar thoughts around being mindful of the length of the document as a whole and expressed

the desire for shorter documentation to engage with. P3 expressed that the “Worksheet” could be both embedded into the body of the toolkit and put at the end as “an addendum” (P3). They discussed how they envisioned others using the toolkit:

Somebody after they went through [the Toolkit], all they’re going to do is take out the pages they’re really going to use like those charts and that are helpful. And they’re going to print those off and they’re going to use that. (P3)

P2’s sentiments were in a similar vein, expressing how they felt people will opt to read a shorter document first. They suggested that the “Worksheet” should be a separate document from the Toolkit, as they felt that by having the option of a shorter document, – the “Worksheet” – “people are more likely to go through that first” and then refer back to the larger document (P2). In contrast, P1 felt that presenting the toolkit as “one large file” was preferred “otherwise [they] can lose track of [the documents]” (P1). This question around distribution methods revealed individual preferences and offers perspective when creating a format that can be adjusted.

In preparation for making final recommendations for Toolkit v.2, I combined these interview findings with the usability assessments qualitative results (i.e., comments, questions and behavior) to further contextualize my findings. Out of this analysis in conjunction with the analysis from Stage 1 and 2, the next chapter outlines a set of recommendations for Toolkit v.2 while describing sections and elements that need further exploration.

## Chapter 5: Design Artifact Recommendations

### **Recommendations for Toolkit v.2**

Based on the collective data analysis from the three research stages, I outline some tangible design recommendations for Toolkit v.2, while noting areas that need further exploration. I offer recommendations in four key areas: (1) Structure; (2) Content; (3) Style; and (4) Distribution Format.

#### **Structure**

The overall response from participants about Toolkit v.1 was positive, with P1 and P3 rating their confidence level a “5” – very confident – if they were to use this toolkit when facilitating KidsTeam sessions on their own, and P2 rating their confidence a “3,” with higher confidence if they knew they had the participation they wanted. However, my data analysis revealed there are some structural elements to take into consideration for Toolkit v.2.

#### **Table of Contents (TOC)**

For paper-based information, a TOC acts as a menu and tool for locating and navigating through information. I found that all participants used Toolkit v.1’s TOC throughout the usability assessment to varying degrees. They all started the usability assessment on the TOC (page 1) and used it in their first task. They also referred back to it in the middle of future tasks to search for more information as one might use a menu bar when navigating a website. However, as I mentioned Chapter 4, two participants (P2 & P3) were vocal about the TOC being too text heavy given the length of the document. The TOC currently has 3 levels of headings and subheadings for a 17-page document (not including references). P2, when asked about how many “tiers” of information should be represented, suggested one. P3 did not make an explicit suggestion but, throughout both the usability assessment and interview, they remarked about how much text there is. In Task 1 they stated:

My first thing would be to look in the table of contents. And you know frankly? I'm going to look down there and say, 'Oh my gosh there's so much stuff down there.' So, I'm just going to skim through. And keep going through. I like the bold subject headings. (P3)

From this, my recommendation for Toolkit v.2 would be to reduce the level of detail to one or two levels and add an "Overview" section at the beginning of the toolkit. This choice reinforces my findings from Stage 1, specifically, Theme 2: *Providing resources to help with advanced planning and preparation* and Theme 4: *Clarity through program specificity and desired outcomes and goals*. While I originally did not consider the TOC as a document that would help with planning KidsTeam programs explicitly, I now see it as an essential tool that can help guide librarians through using the toolkit. With that, it can aid in their interpretation of how they are to engage with the information included in the toolkit. I'd also suggest reconsidering the verbiage of the headings and subheadings given they will be the primary signals for the information contained within.

These findings reflect the information architecture of Toolkit v.1. In Stage 2, I used a "top-down approach" when creating Toolkit v.1's content as I "start[ed] with the broadest categories or possible content and functionality needed to accomplish [my research's] strategic goals" (Garrett, 2010). It is possible that for Toolkit v.2, taking a "bottom-up approach...[s]tarting with the source material that exists,...group items together into low-level categories and then group those into higher-level categories" (Garrett, 2010) may help alleviate some of the identified issues with findability. I would suggest conducting card sorting tests with potential users in order to inform the structure and verbiage of the TOC, similarly to how HCI practitioners use this technique to assess the information architecture of a website.

### **Flow of Information between Toolkit v.1's Sections**

Within Toolkit v.1, I embedded a second set of documents titled: "Worksheet: Create Your Own KidsTeam Program." These documents were meant to be used in tandem with Toolkit v.1, as the "Worksheet" section served as space for librarians to plan

and individualize their KidsTeam program. However, since the “Worksheet’s” sections were created based off of the data analysis from Stage 1, I didn’t have conclusive data to inform how these documents fit into the overall structure of Toolkit v.1 in a way that would reveal both their distinct qualities and their interdependence. The overarching goal of the toolkit is to be a tangible resource for librarians to use when planning, implementing and facilitating their own KidsTeam co-design sessions. So, I designed the “Worksheet” as the action-oriented piece of the document, the one that librarians can individualize based on their needs. Thus, I placed the “Worksheet” at the front of Toolkit v.1 (starting on page 3 after “Welcome” explains the purpose of Toolkit v.1 and “Worksheet”) as an indicator that this primary position signals its importance and highlights its usability before going into the detailed resources which are predominantly text-heavy and less interactive on their own.

When designing the toolkit, I envisioned that librarians could remove the worksheet and look at it as they were engaging with the other content and resources of the toolkit as they see fit. My data analysis from Stage 1 & 2 revealed flexibility of program planning was critical given Theme 3: *Ability to tailor the KidsTeam program to youth patron’s and librarian’s needs and goals, taking into consideration the limitations for both.* However, through the usability assessment, I realized my logic was flawed given that I didn’t fully consider how that ability to remove the “Worksheet” would translate when viewing it in its digital format. Toolkit v.1 loses some of its interactive qualities when viewed online, as the way one can engage with it becomes linear in nature: one can only scroll forwards and backwards to interact with its contents. The assessment revealed just the amount of back-and-forth required with the “Worksheet” embedded into the larger Toolkit v.1. I saw all participants scroll back-and-forth through the pages during the 11 tasks as one task started from the page in which the last task ended. This location varied and often wasn’t the TOC, which is the main wayfinding resource of the toolkit. There are ways to more easily navigate through a PDF, such as utilizing the page number function at the top of PDFs in which one can type in the page number they wish

to go to, as P1 showcased during the usability assessment. However, both techniques – scrolling back-and-forth and using the page number functionality – require a user to rely on their working memory to store, remember and act upon knowledge about where information exists in the document. This demand on working memory can increase a user’s cognitive load unnecessarily, leading to fatigue and a poor overall user experience. It appears that the schemas I implemented to assist in wayfinding did not effectively reflect nor “organize the elements of information according to the manner with which they [were to] be dealt” (Sweller, 1994).

The issues with findability and navigation became clear throughout the usability assessment, as I witnessed participants struggle to find the information they were looking for. During Task 1, when asked to find “...information to start planning your timeline,” which is located in the “Worksheet” section “Planning Your Program Timeline,” P2 remarked how they thought they remembered seeing this information somewhere (alluding to when they viewed the toolkit before the usability assessment) but, when they couldn’t find it again, they began to get worried saying, “I don’t remember, oh no... I feel like I passed it. I feel like it was that first thing. Is what I was thinking...Oh no maybe it is this. I feel like maybe this is the planning thing” (P2). They settled on “Preparing the Design Specific Activities” section of “Worksheet.” When reflecting on the usability assessment, P1 recalled how the flow of the toolkit felt off to them and the repetitive information in parts was more confusing than helpful:

I think specifically for the planning processes and there was a little bit of redundancy in charts. Just because that five-step chart shows up a couple times and as you saw earlier, I kept remembering the wrong page. I was looking for the second time it showed up, but I kept going back to the first time it showed up and going, “Ah where’s the information.” (P1)

The charts they are referencing are found in both “Worksheet” and other parts of Toolkit v.1.

P3 expressed some frustration, specifically in Task 2B, about not being able to find what they were looking for after searching through the document and the TOC, noting that: “At that point I’m going to say, ‘It was helpful up to this point and I don’t think I’m going to go back to this again’” (P3). While they later commented about how the toolkit was useful once they understood how it worked, this first impression of the toolkit reveals that the confusion it presents during early interactions could prevent individuals from exploring the toolkit further or potentially from using it at all.

To alleviate some of this confusion and frustration earlier on, a set of recommendation comes directly from participants. First would be to restructure the “Worksheet” into “one or two pages” (P1) or into a “cheat sheet” (P3). The intention of this shortened document would be to give librarians all the information they need for planning at a glance. It wasn’t fully clear how the “Worksheet” could be transformed into this type of document, but the sentiment was clear that something short, concise and easy to read was of interest to participants. I will explore this idea further in the Content section below, as a restructuring of the “Worksheet” could also require a re-writing of its content.

In order to make more definitive recommendations for the specific restructuring of Toolkit v.1, I suggest further exploration and usability assessments, targeting specific sections of text. These assessments should focus on identifying areas of Toolkit v.2 that can be redesigned to reduce the user’s “extraneous cognitive load” (Sweller, 1994), as the toolkit requires a significant level of interactivity in order to learn and utilize its contents. Researchers posit that a reduction in “extraneous cognitive load” can assist in learning and the utilization of “schemas effectively increase the amount of information that can be held in working memory by chunking individual elements into a single element” (Sweller, 1994, p. 299). I anticipate that implementing the earlier suggestions of a refined TOC in addition to chunking relevant information together into schemas may help with this extraneous cognitive load and alleviate some of the findability issues. I anticipate these types of assessments will offer further guidance on restructuring Toolkit v.1.

## Content

While the usability assessment did not attempt to assess Toolkit v.1's content in detail, there were some notable discoveries that are important to consider when creating Toolkit v.2. Continuing the "Worksheet" discussion from the above section, I begin with recommendations around revising the "Worksheet's" contents.

### Transforming the "Worksheet"

The creation of the "Worksheet" was in response to the thematic analysis conducted in Stage 1 and Stage 2. It has four distinct sections spanning four pages. While its contents and structure attempt to address the needs discovered in all four themes, the majority of the design decisions were made with two themes in mind:

Theme 2: Providing resources to help with advanced planning and preparation

Theme 3: Ability to tailor the KidsTeam program to youth patron's and librarian's needs and goals, taking into consideration the limitations for both

Refer to Chapter 4 for more detailed discussion on how the "Worksheet" addresses these themes. In the usability assessment, I created specific tasks with the intention of seeing how and in what way participants would engage with the "Worksheet" and its contents. I also asked specific questions at the end of usability assessment about the "Worksheet" in order to add more nuance to my usability findings. From these results, I discovered that Toolkit v.1's design didn't adequately reflect the distinction between the two documents and in some cases the design contrasted with the users' current mental model of a worksheet.

Therefore, one recommendation for Toolkit v.2 is to reduce the length of the "Worksheet" to signal that it is separate from the Toolkit v.1 as a whole and is meant to be used in tandem when planning KidsTeam programs. P1 offered great insight into the expectations that the word "worksheet" elicits: "My expectation is, 'Here is the worksheet, this is what you are going to use practically and later in the document you will see sections that explain this part of it'" (P1). They go on to further explain:

I think the worksheet should be...just one to two pages. Something that would be maximum front and back of one physical piece of paper with...something in the front..., “Don’t worry. All of these terms and processes will be explained afterwards. This is just your printable.” So, you don’t need to explain it if you’re going to explain it later in more detail. (P1)

This expectation echoes industry standards. P2 and P3 offered similar sentiments regarding the length of the worksheet. P2 didn’t explicitly comment that the “Worksheet” contained repetitive information, but they seemed to warn against it when asked if the “Worksheet” and toolkit complement one another:

I don’t think they could complement each other more just because you don’t want the worksheet to be overly clunky. I think if you added any more in there where you were pulling from the actual toolkit, I think it would add too much information and at some point, people just stop reading. (P2)

While P3 stated, “...it would [be] nice to have...a quick check sheet. A cheat sheet so that when you’re in the midst of chaos you can still remember where you’re going” (P3). I asked if the “KidsTeam Program Session Template” could fill that need, as it was designed for week-of planning. They said yes, but remarked how they didn’t recognize it as such during the usability assessment. This again brings up a common theme of participants not being able to find the information that would presumably be useful to them.

From these findings, I recommend two content and structure transformations with the intention of assessing them through further research. The first recommendation would be to eliminate “Worksheet” all together and create two separate action documents that are each 1-2 pages. The first would focus on “advance program planning,” while the second would provide space and direction for the weekly planning required due to the fact that each individual KidsTeam design session is based off of the design artifacts gleaned from the session before it. This second sheet would include the “KidsTeam Program Session Template” which is pulled directly from Walsh’s KidsTeam Project

Repository (Walsh, 2018/2020), as all participants commented on its usefulness. The second recommendation would be to keep the “Worksheet” as is but significantly trim down its contents to include only actionable items. To avoid watering down its contents, I’d recommend incorporating symbols or other signifiers that cue a user to access the associated toolkit for more information or context.

### **Providing a Clear – and easy to find – Sample KidsTeam Program**

As mentioned above, Stage 3 uncovered that participants weren’t always able to find the information they were looking for. Interestingly, in the follow up interview they made suggestions for content that was already included in Toolkit v.1, but that had proved difficult to access or find. I found this was in part due to my misinterpretation of how to translate the needs of participants into design elements. A prime example of this was participants desire for a sample KidsTeam program. I recognized this as a need from my analysis of Stage 1’s results, specifically in Theme 4: *Clarity through program specificity and desired outcomes and goals* and tangentially through Theme 2: *Providing resources to help with advanced planning and preparation*. Out of these themes, I incorporated past examples of KidsTeam work throughout several sections of Toolkit v.1. “Specifics of the 5 Phases of an Individual Design Program Session,” cited from Walsh’s KidsTeam Project Repository, incorporates examples from past KidsTeam design sessions for each of the 5 Phases. I also included links to previous research offering more detailed KidsTeam examples in the “Additional Resources” section. Part of the reason for incorporating these examples as external links was that I wanted to be mindful of Toolkit v.1’s length. I believed that providing a link would enable those who are interested in seeking out further information to do so.

However, by providing that information in an external link, requiring the user to leave the document to access the information, the link runs the risk of not being used. In reference to the additional resources Toolkit v.1 provides on activities and design techniques, P3 notes, “I wonder if people are going to go back to that and look at this. If they want examples, are they going to look at these papers?” (P3). During the usability

assessment, P2 said that they did in fact look at the links when reading through the “Activity Ideas....” But during the follow-up interview, they remarked how for someone who has never done a KidsTeam program before, “a concrete example would be useful of...the filled-out ‘Goals’ and something that’s filled out like a worksheet, so that they understand an example of the full process” (P2). While I didn’t ask if the external links could provide this type of example, their explicit suggestion of incorporating an example of the full process leads me to believe that they felt this addition was necessary. P1 also made an explicit call for a “concrete example” of a KidsTeam program. When looking at the “Specifics of the 5 Phases of an Individual Design Program Session” they said, “something that felt missing for a few of these steps would be...a sample program” (P1). They went on further to say they “would have like[d] to have seen more of that woven throughout” (P1). And while this section provides some examples from past KidsTeam work, I interpreted their statement as wanting more specific information in this section. They offered that the sample program could both be a separate document and or embedded into the section on the 5 Phases. They did not expand upon what exactly it would look like in either case.

From these findings, and taking into consideration P1’s suggestions, I make two suggested adaptations for Toolkit v.2, with the intention of assessment through further research. First would be to incorporate a designated section that outlines a past KidsTeam program in full. By having this as its own section rather than embedded into a section(s), librarians can scan the TOC and see this is offered and refer to it if or when they need to. The second option would be to re-write the “Specifics of the 5 Phases of an Individual Design Program Session” section so that the current embedded examples are more easily identifiable. This could come from leveraging certain stylistic elements like bolding, icons, etc. to signify their purpose. Some of this information could come from Walsh’s article “Anatomy of a Design Session,” which details a KidsTeam program in full (Walsh, 2013). As mentioned earlier, this article is currently situated in the “Tips” section

below the “Specifics of the 5 Phases of a Design Program Session,” but none of the participants mentioned seeing it.

### **Style**

Expanding upon the above recommendations, this section explores additional recommendations focused on the stylistic elements of Toolkit v.1. As mentioned in Chapter 3, Toolkit v.1 was designed as a mixed-fidelity paper-based interactive prototype hosted online, in which most elements were low-fidelity with a few high-fidelity aspects (i.e. graphics on the 3 Design Stages and 5 Phases, refer back to Figures 2 and 3). See Chapter 4 for more discussion of these choices. The usability assessment of Stage 3 was developed in part to explore the usage of these stylistic elements in finding and understanding Toolkit v.1’s information. The results of the usability assessment revealed that participants utilized the headers and sub headers to navigate and find information throughout Toolkit v.1. P1 expressed how they liked “...having the black bars across the separate sections...It felt very distinct, each section” (P1). I also saw P2 and P3 using the headers frequently throughout the usability assessment. I recommend keeping the headers and sub headers in their current style of high contrast utilizing both color and form (the boxes around the headers). If Toolkit v.2 is to use color as a signifier, I’d refer to “A Web for Everyone. Designing Accessible Experiences” (Horton & Queensbery, 2013) for guidelines regarding the use of color as a wayfinding mechanism.

A stylistic element that also impacts the content of Toolkit v.2 would be the incorporation of more charts and visuals, as all participants alluded to wanting these in some capacity. During the usability assessment, P3 mentioned how their method of findings information in Toolkit v.1 is, “skimming through, looking for graphic organizers...visual stuff. Not reading all of the things” (P3). P2 remarked how the visuals assisted in highlighting the information in Toolkit v.1, stating: “I think [Toolkit v.1] expressed what it wanted to express, and you did it in a pretty visual way. I think the core concepts or design ideas and the process itself, that was pretty well highlighted” (P2). They are referring to the two graphics which visually explain the 3 Design Stages and the

5 Phases (refer back to Figures 1 and 2). I thus recommend keeping the visuals as they are and before adding any more charts, I would suggest conducting further research regarding how librarians use Toolkit v.2 in the context of a KidsTeam session. This additional research may reveal if and how these visual elements are used in the pursuit of planning, implementing and facilitating a program and will indicate whether any additions are necessary.

Another set of visuals to consider are the picture placeholders of Toolkit v.1. Only P2 expressed curiosity about the pictures, eager to see what they were going to be. For Toolkit v.2 I plan to move forward with including pictures in the following sections: “Goals of KidsTeam,” “Setting Up Your Design Space,” “Supplies List,” and “Activity Ideas for Phase 3: Design Time.” Based on earlier recommendations about adding in a section that details a KidsTeam program example, there is an opportunity to include pictures there, but this will depend largely on the content of the section.

As the toolkit continues to be stylized and moves from a mixed-fidelity prototype to a finalized version for public consumption, I urge that the choices be guided by an accessibility-first mindset. One suggestion would be to first conduct accessibility and plain language audits on Toolkit v.1. This can offer guidance for which sections of Toolkit v.2 may need adjustment.

### **Distribution Format**

The final recommendation focuses on the distribution format of the toolkit. As my results showed in Chapter 4, each participant had a different personal preference for how they'd like to receive and engage with the toolkit. This reinforced my analysis from Stages 1 and 2 indicating that flexibility of format is crucial. Data from Stage 3 revealed that the main debate is between keeping the “Worksheet” separate from the other Toolkit v.1 documents or keeping it as one document. One compromise would be to include the “Worksheet” in the larger Toolkit v.1 as an “addendum” as P3 had suggested. P1 offered support for this choice as they preferred Toolkit v.1 to be “one large file” (P1). However, P2 felt that having them as separate documents was best. To account for this, a separate

document could be made that is just the “Worksheet” portion. How simple or difficult this is to create depends on where the toolkit is to be stored online. If it is stored as a downloadable PDF, a zip file could be created to host all the documents if there are multiple. If the choice is to transfer the content into a GitHub repository like Walsh’s current KidsTeam Project Repository, I suggest additional user testing, specifically card sorting, be conducted to inform the information architecture.

Forming my recommendations for distribution methods has me pondering not only in what format the toolkit is best received but also if the format of an online-based PDF toolkit is the most effective for librarians when planning, implementing and facilitating KidsTeam programs. I bring this up given the comments made by P2 and P3 during Stage 1 of research in which there was mention of hosting a training for librarians (P2) and then creating space for reflection post-KidsTeam work (P3).

The answer to the question of alternate formats is outside of the scope of my research design, but it is one that I urge researchers to consider when conducting further research on this topic. There are limitations that a toolkit of this design – paper-based online interactive prototype – has in offering the interactivity of a training and/or reflection. It behooves us to explore this context further and to determine if and what other resource formats may assist librarians in learning the KidsTeam program and implementing it into their library branches.

## Chapter 6: Conclusion

### Summary of Research

The goal of this research was to explore and design a draft of a standalone Toolkit for public librarians to use when conducting KidsTeam programs in their library branches without academic researchers. Throughout this research, I was guided by one of KidsTeam research's main principles: to better our "efforts to co-design technologies that are more relevant to children's interests and needs" (*KidsTeam*, n.d.). In conjunction with recent discussions in PD around equitable design, in which community members not only facilitate, but lead and dictate design for and with their communities, my goal is that my research findings will add to the current body of work.

I posited that a KidsTeam toolkit of this nature designed for public librarians to use directly with their youth patrons could benefit both public librarians and CCI academic researchers and practitioners. For the former, the toolkit acts as a resource they could use to lead the use of co-design techniques with the children in their communities as well as guide further libraries' initiatives to incorporate design thinking into their field (Figueroa, 2018). For CCI academic researchers and practitioners, the toolkit design artifact is the continuation of work with intergenerational design teams, specifically Walsh's KidsTeam Project Repository (Walsh, 2018/2020), and the toolkit aims to expand upon co-design research done in and with public library communities as well as act as a springboard for continual RtD research in this field. To help facilitate additional research, I've put Toolkit v.1 under the Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA). The full toolkit is available in Appendix C.

Based on my research, I outline some of the limitations of this study. It is out of these limitations in conjunction with my research findings, specifically my recommendations for Toolkit v.2, that I present my plan for future research as well as offer an invitation to other applied researchers in the field of CCI to expand upon this work.

### **Limitations**

In attempts to situate my research findings and design recommendations into the current body of research, it is necessary to outline some limitations of my research. While each of the participants had first-hand experience co-facilitating KidsTeam design sessions in their libraries, it is important to note the limitations of such a small sample size. Only three librarians were interviewed, all from a single library system. This is a very small sample size, and thus the results cannot be generalized to the larger population of public librarians. Additionally, these three librarians all had experience co-facilitating, and thus the findings cannot be assumed to reflect the experience and/or needs of librarians who have not facilitated KidsTeam design sessions before. This study serves as pilot and a jumping off point for other researchers in the field of CCI.

Another limitation of note is the bias that I bring into this research study. I myself am a librarian in the same geographic region as my participants, but for a different library system. I bring my own inherent biases to the interpretation of the data given my past experience working with children as a youth librarian. This is why it was essential to bring in a second coder in order to reach agreement when refining codes that would then generate the themes. However, it is important to note that the second coder was using a codebook I created based off of my interpretation of the data and the second coder was not a part of the study in any other capacity. I acknowledge that some of my biases may still be evident in my interpretation of the results.

Additionally, I also bring in bias as an academic researcher who has had first-hand experience co-facilitating Walsh's adapted KidsTeam programs with public librarians. While I did not work with any of the participants in this study in my past research, it is important to note that I came into this study with that experience as a frame of reference. While this experience may add to my credibility as a researcher in CCI, I acknowledge that my past experience could have clouded my ability to experience the data with "fresh eyes." I was also the only researcher present during the interviews. So, while I took handwritten notes and compared them with the recorded interviews, it is

possible that I misinterpreted some of the information. This again was why it was crucial to have a second coder review and code the data from Stage 1.

### **Plans for Future Research**

Given the limitations of this study, I encourage there to be continual research on Toolkit v.2 in the pursuit of creating a standalone Toolkit for public librarians to use when conducting KidsTeam research in their branches with their youth patrons. Based on my findings and recommendations, I outline the ways I hope to continue this research. First, I plan to continue to refine and edit Toolkit v.1 to create a working draft of Toolkit v.2, with the immediate next step of conducting accessibility and plain language audits on Toolkit v.1. From there, I hope to collaborate with Walsh and add my results to his KidsTeam Project Repository to reflect the results of this data. There will be further discussion around the platform to house this information, so that it is both accessible and easily downloadable. It is intended that this draft will be available online for both academic researchers to access for research and industry purposes and for librarians that are looking to use the toolkit to host their own KidsTeam sessions.

A crucial next research step would be to assess the effectiveness of Toolkit v.2 in the context of librarians planning, implementing and facilitating an actual KidsTeam program in their library. I posit this type of research design would allow for researchers to more critically assess both the findability and applicability of the toolkit's content in the proposed context of use. I invite other applied researchers to utilize Toolkit v.1 and the future Toolkit v.2, as well as my findings from this study, to conduct this further research.

## References

*About.* (n.d.). Creative Reaction Lab. Retrieved July 22, 2020, from

<https://www.creativereactionlab.com/about>

*About—Design Thinking for Libraries.* (n.d.). Design Thinking for Libraries. Retrieved

July 28, 2020, from <http://designthinkingforlibraries.com/about>

*ALSC National Research Agenda for Library Service to Children (Ages 0-14).* (2019).

<http://www.ala.org/alsc/publications-resources/research-agenda>

Anderson, M., & Kumar, M. (2019, May 7). Digital divide persists even as lower-income

Americans make gains in tech adoption. *Pew Research Center.*

<https://www.pewresearch.org/fact-tank/2019/05/07/digital-divide-persists-even-as-lower-income-americans-make-gains-in-tech-adoption/>

Bardzell, J., Bardzell, S., Dalsgaard, P., Gross, S., & Halskov, K. (2016). Documenting the Research Through Design Process. *Proceedings of the 2016 ACM Conference on Designing Interactive Systems - DIS '16*, 96–107.

<https://doi.org/10.1145/2901790.2901859>

Bech-Petersen, S. (2020). Design Thinking as a Framework for Innovation in Libraries.

*Bibliothek Forschung Und Praxis*, 44(1), 7–11. <https://doi.org/10.1515/bfp-2020-0009>

Bell, S. J. (2018). *Design Thinking + User Experience = Better-Designed Libraries*. 3.

Brenner, W., Uebernicket, F., & Abrell, T. (2016). Design Thinking as Mindset, Process, and Toolbox. In W. Brenner & F. Uebernicket (Eds.), *Design Thinking for*

*Innovation* (pp. 3–21). Springer International Publishing.

[https://doi.org/10.1007/978-3-319-26100-3\\_1](https://doi.org/10.1007/978-3-319-26100-3_1)

Brown, T., & Wyatt, J. (2010, Winter). Design Thinking for Social Innovation (SSIR).

*Stanford Social Innovation Review*.

[https://ssir.org/articles/entry/design\\_thinking\\_for\\_social\\_innovation](https://ssir.org/articles/entry/design_thinking_for_social_innovation)

Bødker, S., Grønbaek, K., & Kyng, M. (1995). Cooperative Design: Techniques and

Experiences From the Scandinavian Scene. In *Readings in Human–Computer*

*Interaction* (pp. 215–224). Elsevier. [https://doi.org/10.1016/B978-0-08-051574-](https://doi.org/10.1016/B978-0-08-051574-8.50025-X)

[8.50025-X](https://doi.org/10.1016/B978-0-08-051574-8.50025-X)

Charmaz, K. (2008). Grounded Theory as an Emergent Method. In *Handbook of*

*Emergent Methods* (pp. 155–170). Guilford Press.

<https://books.google.com/books?hl=en&lr=&id=vbyxBkkjFeYC&oi=fnd&pg=PA>

[155&dq=emergent+coding+grounded+theory&ots=cP-](https://books.google.com/books?hl=en&lr=&id=vbyxBkkjFeYC&oi=fnd&pg=PA)

[l0Nzodd&sig=sy\\_\\_fFsZ5ohMJURMVcZ1ir53QwI#v=onepage&q=emergent%20](https://books.google.com/books?hl=en&lr=&id=vbyxBkkjFeYC&oi=fnd&pg=PA)

[coding%20grounded%20theory&f=false](https://books.google.com/books?hl=en&lr=&id=vbyxBkkjFeYC&oi=fnd&pg=PA)

Chase, S. (2017). Design Thinking in Action: Changing the Public Service Model. *OLA*

*Quarterly*, 22(3).

[http://journals3.library.oregonstate.edu/olaq/article/view/vol22\\_iss3\\_6](http://journals3.library.oregonstate.edu/olaq/article/view/vol22_iss3_6)

Chen, X. (Sue), Nayak, M., Wong, T. C., Kawas, S., & Kientz, J. A. (2020). Interaction

design & children toolkit. *Proceedings of the 2020 ACM Interaction Design and*

*Children Conference: Extended Abstracts*, 256–259.

<https://doi.org/10.1145/3397617.3402031>

Creative Reaction Lab. (2019, September 23). Redesigners for Justice: The leaders we need for an equitable future. *Medium*. <https://medium.com/equal-space/redesigners-for-justice-the-leaders-we-need-for-an-equitable-future-d3a73459ba60>

Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). SAGE Publications.

Dam, R. F., & Siang, T. Y. (n.d.). *5 Stages in the Design Thinking Process*. The Interaction Design Foundation. Retrieved July 28, 2020, from <https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process>

*Design Process*. (n.d.). [http://www.cs.umd.edu/hcil/kiddesign/design\\_process.shtml](http://www.cs.umd.edu/hcil/kiddesign/design_process.shtml)

*Design Thinking for Libraries Toolkit*. (2015).

<https://drive.google.com/drive/folders/18FN76ofJLHvRMpwqZQ1nMuV-AeGPvsZK>

Druin, A. (2002). The Role of Children in the Design of New Technology. *Behaviour and Information Technology*, 38.

Druin, A. (2005). What Children Can Teach Us: Developing Digital Libraries for Children with Children. *Library Quarterly - LIBR QUART*, 75.

<https://doi.org/10.1086/428691>

Druin, A. (1999). *Cooperative inquiry: Developing new technologies for children with children*. 592–599.

Eccles, J. S. (1999). The Development of Children Ages 6 to 14. *The Future of Children*, 9(2), 30. <https://doi.org/10.2307/1602703>

Ellis, C. A., Gibbs, S. J., & Rein, G. (1991). *Groupware: Some issues and experiences*. Association for Computing Machinery. <https://doi.org/10.1145/99977.99987>

Figuroa, M. (2014, July 31). *Center for the Future of Libraries* [Text]. Tools, Publications & Resources. <http://www.ala.org/tools/future>

Figuroa, M. (2018, May 4). *Design Thinking* [Text]. Tools, Publications & Resources. <http://www.ala.org/tools/future/trends/designthinking>

Garrett, J. J. (2010). *The Elements of User Experience: User-Centered Design for the Web and Beyond*. Pearson Education.

Gibbons, S. (2016, July 31). *Design Thinking 101*. Nielsen Norman Group. <https://www.nngroup.com/articles/design-thinking/>

Goldschmidt, G. (2016). Linkographic Evidence for Concurrent Divergent and Convergent Thinking in Creative Design. *Creativity Research Journal*, 28(2), 115–122. <https://doi.org/10.1080/10400419.2016.1162497>

Greeno, J. G. (1998). The situativity of knowing, learning, and research. *American Psychologist*, 53(1), 5–26. <https://doi.org/10.1037/0003-066X.53.1.5>

Grudin, J. (1994). Computer-Supported Cooperative Work: History and Focus. *Computer*, 27(5), 19–26.

Guha, M. L., Druin, A., Chipman, G., Fails, J. A., Simms, S., & Farber, A. (2005).

Working with Young Children as TECHNOLOGY DESIGN PARTNERS.

*Communications of the ACM*, 48(1), 39–42.

<https://doi.org/10.1145/1039539.1039567>

Guha, M. L., Druin, A., & Fails, J. A. (2013). *Cooperative Inquiry Revisited: Reflections of the Past and Guidelines for the Future of Intergenerational Co-design*.

Harrington, C. N. (2020, June). The Forgotten Margins: What is Community-Based Participatory Health Design Telling Us? *Association for Computing Machinery*, 27(3), 24–29.

Harrington, C., Erete, S., & Piper, A. M. (2019). Deconstructing Community-Based Collaborative Design: Towards More Equitable Participatory Design Engagements. *Proceedings of the ACM on Human-Computer Interaction*, 3(CSCW), 1–25. <https://doi.org/10.1145/3359318>

*History*. (n.d.). IDEO | Design Thinking. Retrieved July 18, 2020, from <https://designthinking.ideo.com/history>

Holtzblatt, K., & Beyer, H. (2017). *Contextual Design: Design for Life* (2nd ed.). Morgan Kaufmann.

Horton, S., & Queensbery, W. (2013). *A Web for Everyone*. Louis Rosenfeld.

Hourcade, J. P. (2015). *Child-Computer Interaction*. Juan Pablo Hourcade.

*IDEO Design Thinking*. (n.d.). IDEO | Design Thinking. Retrieved July 22, 2020, from <https://designthinking.ideo.com/>

*IFLA -- About IFLA.* (n.d.). Retrieved December 17, 2020, from

<https://www.ifla.org/about>

*IFLA -- IFLA/UNESCO Public Library Manifesto 1994.* (n.d.). Retrieved December 17,

2020, from [https://www.ifla.org/publications/iflaunesco-public-library-manifesto-](https://www.ifla.org/publications/iflaunesco-public-library-manifesto-1994)

1994

Iskander, N. (2018, September 5). Design Thinking Is Fundamentally Conservative and

Preserves the Status Quo. *Harvard Business Review.*

[https://hbr.org/2018/09/design-thinking-is-fundamentally-conservative-and-](https://hbr.org/2018/09/design-thinking-is-fundamentally-conservative-and-preserves-the-status-quo)

[preserves-the-status-quo](https://hbr.org/2018/09/design-thinking-is-fundamentally-conservative-and-preserves-the-status-quo)

Iversen, O. S., & Brodersen, C. (2008). Building a BRIDGE between children and users:

A socio-cultural approach to child–computer interaction. *Cognition, Technology*

*& Work, 10*(2), 83–93. <https://doi.org/10.1007/s10111-007-0064-1>

Iversen, O. S., & Dindler, C. (2013). A Utopian agenda in child–computer interaction.

*International Journal of Child-Computer Interaction, 1*(1), 24–29.

<https://doi.org/10.1016/j.ijcci.2012.08.002>

Iversen, O. S., Smith, R. C., & Dindler, C. (2017). Child as Protagonist: Expanding the

Role of Children in Participatory Design. *Proceedings of the 2017 Conference on*

*Interaction Design and Children, 27–37.*

<https://doi.org/10.1145/3078072.3079725>

*Jerry Alan Fails—Boise State University, Human-Computer Interaction Lab.* (n.d.).

Retrieved May 13, 2020, from

<http://cs.boisestate.edu/~jfails/kidsteam/index.shtml>

*KidsTeam: Children & Adults Working as Design Partners – HCIL.* (n.d.). Retrieved

May 13, 2020, from <https://hcil.umd.edu/children-as-design-partners/>

*KidsTeam Libraries.* (n.d.). KidsTeam Libraries. Retrieved May 13, 2020, from

<https://www.kidsteam.ischool.uw.edu>

*Kidsteam UB.* (n.d.). Kidsteam UB. Retrieved May 13, 2020, from

<https://home.ubalt.edu/gwalsh/kidsteam.html>

*KidsTeam UW.* (n.d.). KidsTeam UW. Retrieved May 13, 2020, from

<https://www.kidsteam.ischool.uw.edu>

Knudtzon, K., Druin, A., Kaplan, N., Summers, K., Chisik, Y., Kulkarni, R., Moulthrop,

S., Weeks, H., & Bederson, B. (2003). Starting an intergenerational technology

design team: A case study. *Proceedings of the 2003 Conference on Interaction*

*Design and Children*, 51–58. <https://doi.org/10.1145/953536.953545>

Kyng, M. (1991). Designing for cooperation: Cooperating in design. *Communications of*

*the ACM*, 34(12), 65–73. <https://doi.org/10.1145/125319.125323>

Lahey, J. (2017, January 4). *How Design Thinking Became a Buzzword at School.* The

Atlantic. [https://www.theatlantic.com/education/archive/2017/01/how-design-](https://www.theatlantic.com/education/archive/2017/01/how-design-thinking-became-a-buzzword-at-school/512150/)

[thinking-became-a-buzzword-at-school/512150/](https://www.theatlantic.com/education/archive/2017/01/how-design-thinking-became-a-buzzword-at-school/512150/)

- Landay, J. A., & Myers, B. A. (2001). Sketching interfaces: Toward more human interface design. *Computer*, 34(3), 56–64. <https://doi.org/10.1109/2.910894>
- Lee, S.-H. (2018, February 23). *The Future Learning Experience of Public Area—Redesign Shanghai Library Innovation Space* [Video]. <http://designthinkingforlibraries.com/examples>
- Logo Computer Systems Inc. (1999). *Logo philosophy and implementation*. Logo Computer Systems.
- Markopoulos, P., Read, J. C., MacFarlane, S., & Hoysniemi, J. (2008). *Evaluating Children's Interactive Products: Principles and Practices for Interaction Designers*. Elsevier.
- McCurdy, M., Connors, C., Pyrzak, G., Kanefsky, B., & Vera, A. (2006). Breaking the fidelity barrier: An examination of our current characterization of prototypes and an example of a mixed-fidelity success. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems - CHI '06*, 1233. <https://doi.org/10.1145/1124772.1124959>
- Meier, J. J., & Miller, R. K. (2016). *Turning the revolution into an evolution: The case for design thinking and rapid prototyping in libraries* | Meier | *College & Research Libraries News*. 77(6). <https://doi.org/10.5860/crln.77.6.9506>
- Muller, M. J., Blomberg, J. L., Carter, K. A., Dykstra, E. A., Madsen, K. H., & Greenbaum, J. (1991). Participatory design in Britain and North America: Responses to the “Scandinavian Challenge.” *Proceedings of the SIGCHI*

*Conference on Human Factors in Computing Systems*, 389–392.

<https://doi.org/10.1145/108844.108962>

*Our Approach*. (n.d.). Creative Reaction Lab. Retrieved July 22, 2020, from

<https://www.creativereactionlab.com/our-approach>

Papert, S., & Harel, I. (2002). *Situating Constructionism*. 17.

Read, J. C., & Bekker, M. M. (2011). The nature of child computer interaction.

*Proceedings of the 25th BCS Conference on Human-Computer Interaction*, 163–170.

Read, J., Gregory, P., MacFarlane, S., McManus, B., Gray, P., & Patel, R. (2002). *An Investigation of Participatory Design with Children – Informant, Balanced and Facilitated Design*. 9.

Resnick, M. (1996). Distributed constructionism. *Proceedings of the 1996 International Conference on Learning Sciences*, 280–284.

Rubin, J., & Chisnell, D. (2008). *Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests* (Second). Wiley Publishing, Inc.

Saldana, J. (2015). *The Coding Manual for Qualitative Researchers*. SAGE.

Sweller, J. (1994). Cognitive load theory, learning difficulty, and instructional design.

*Learning and Instruction*, 4(4), 295–312. [https://doi.org/10.1016/0959-4752\(94\)90003-5](https://doi.org/10.1016/0959-4752(94)90003-5)

The Editors of Encyclopaedia Britannica. (2019). *Ethnography*. Encyclopedia Britannica.

<https://www.britannica.com/science/ethnography>

- van Doorn, F. a. P. (2016). *Children as co-researchers in design: Enabling users to gather, share and enrich contextual data*. <https://doi.org/10.4233/uuid:f16db80d-9f1a-4064-91be-decf8c805898>
- Van Mechelen, M. (2016). *Designing technologies for and with children: Theoretical reflections and a practical inquiry towards a co-design toolkit*. <https://lirias.kuleuven.be/1674366>
- Walsh, G. (2011, March). Kidsteam: Co-designing Children's Technologies with Children User Experience Magazine. *User Experience Magazine*, 10(1). <http://uxpamagazine.org/kidsteam/>
- Walsh, G. (2013). *Anatomy of a design session | ACM Interactions*. <https://interactions.acm.org/archive/view/november-december-2013/anatomy-of-a-design-session>
- Walsh, G. (2020, April 13). *KidsTeam Project Repository*. <https://github.com/gxwalsh/kidsteam> (Original work published 2018)
- Walsh, G. (2018). Towards equity and equality in American co-design: A case study. *Proceedings of the 17th ACM Conference on Interaction Design and Children*, 434–440. <https://doi.org/10.1145/3202185.3202768>
- Walsh, G., Brewer, R., Joshi, A., Brown, R., Druin, A., Guha, M. L., Bonsignore, E., Foss, E., Yip, J. C., Golub, E., Clegg, T., & Brown, Q. (2012). DisCo: A co-design online tool for asynchronous distributed child and adult design partners.

*Proceedings of the 11th International Conference on Interaction Design and Children - IDC '12*, 11. <https://doi.org/10.1145/2307096.2307099>

Walsh, G., Foss, E., Yip, J., & Druin, A. (2013). FACIT PD: A framework for analysis and creation of intergenerational techniques for participatory design. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 2893–2902. <https://doi.org/10.1145/2470654.2481400>

*What is Design Thinking?* (n.d.). The Interaction Design Foundation. Retrieved July 31, 2020, from <https://www.interaction-design.org/literature/topics/design-thinking>

*What is the framework for innovation? Design Council's evolved Double Diamond.* (2015, March 17). Design Council. <https://www.designcouncil.org.uk/news-opinion/what-framework-innovation-design-councils-evolved-double-diamond>

Yip, J. C., Sobel, K., Pitt, C., Lee, K. J., Chen, S., Nasu, K., & Pina, L. R. (2017). Examining Adult-Child Interactions in Intergenerational Participatory Design. *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, 5742–5754. <https://doi.org/10.1145/3025453.3025787>

Zimmerman, J., Forlizzi, J., & Evenson, S. (2007). Research through design as a method for interaction design research in HCI. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 493–502. <https://doi.org/10.1145/1240624.1240704>

## Appendix A: Stage 1: Interview Questions

Below are the general questions asked during the interview. Some participants provided answers to multiple questions at a time thus, the order and explicit asking of questions varied from participant to participant.

### 1) **Background/Professional Library Experience**

1. Tell me a little bit about your career path to becoming a Librarian.
2. What motivated you to become a Librarian and work with children specifically?

### 2) **KidsTeam Experience**

#### a) Pre-KidsTeam

1. Before your experience with KidsTeam, generally speaking, how did you and your staff create youth-centered programming and services at your branch?
2. What was that experience like? Benefits? Drawbacks?
3. What are your goals as a Librarian when it comes to youth-centered programming and services? Does your current process help you achieve those goals?

#### b) Specific KidsTeam Work

1. How did you hear about KidsTeam? What made you want to get involved?
2. Are you aware of any other library branches or departments using a similar research model when creating programs/services for children?
3. How did this process differ from how you and your staff traditionally created services and programs?
4. What surprised you about this process (i.e. children's response, what was created, the content of each session, etc.)?

#### c) Feedback

##### i) Role

1. Describe your role as a co-facilitator during your co-design sessions.

2. How helpful were the documents sent prior to the design sessions? Did you use them throughout the design sessions?
3. What role did other adults/children play?
4. Were the expectations of your role and the role of children clearly outlined in the beginning and throughout the sessions?
  1. If not, what would have made this clearer?

ii) Process

(1) Implementation

1. How receptive was your library to utilizing the KidsTeam program? What are some things to consider when implementing and utilizing this model in the future?
2. How did attendance compare to other programs at your library branch?
3. Is there anything you feel would empower more Librarians to use this model? What are some barriers to implementing this design process in your branch?

(2) Design Sessions

(a) Weekly preparation

1. What are some challenges/benefits to this format of weekly design sessions over the course of a month?
2. How did you prepare for each weekly session?
3. What materials did you use in preparation?

(b) Designing with children

1. Did you feel confident co-facilitating the weekly sessions?
2. What surprised you about the flow of each session?
3. Were there any situations that you did not feel prepared to handle? What would have helped you feel confident in handling that situation?

(c) Format

1. How was easy/difficult was it to follow the weekly session format?

**3) Toolkit Specifics**

1. Imagine you are leading one of these co-design sessions on your own, what do you feel you would need to be prepared each week?
2. What excites you most about facilitating these sessions on your own? What is worrisome?
3. How helpful would a toolkit be when leading co-design sessions with your staff and youth patrons?

**4) Wrap Up**

1. Is there anything else you think I should know when designing a toolkit for Librarians?

[Co-Design with Children: A KidsTeam Toolkit for Librarians: Appendices]

111

Appendix B: Access to Greg Walsh's KidsTeam Project Repository

Walsh's online-based KidsTeam Project Repository can be accessed in full at  
<https://github.com/gxwalsh/kidsteam>.

### Appendix C: Toolkit v.1 Design Artifact

The following pages are the Toolkit v.1 design artifact in its entirety. The version for the interview had a different footer reading “Please Note: This toolkit is not for use outside of the research interview.” The included Toolkit v.1 has the finalized footer expressing the Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

<b>Toolkit Table of Contents</b>
----------------------------------

<b>Welcome</b> .....	<b>2</b>
<b>Toolkit Purpose</b> .....	<b>2</b>
<b>Worksheet Purpose</b> .....	<b>2</b>
<b>Worksheet: Create Your Own KidsTeam Program</b> .....	<b>3</b>
<b>Planning Your Program Timeline</b> .....	<b>3</b>
Desired Date(s) and Time(s) of KidsTeam Program(s):.....	3
Programming Planning Chart.....	3
<b>Preparing the Design Specific Activities</b> .....	<b>4</b>
Goals for My KidsTeam Program.....	4
Defining Your Design Challenge.....	4
<b>Specifics of the KidsTeam Design Process</b> .....	<b>4</b>
Selecting Your Activities and Questions of the Day.....	4
<b>Outlining the Specifics for Each Individual Program Session</b> .....	<b>5</b>
<b>KidsTeam Goals &amp; Background</b> .....	<b>7</b>
Goals of KidsTeam.....	7
KidsTeam Background: Children and adults designing together.....	7
KidsTeam in Public Libraries: Adapting the process for libraries.....	7
<b>KidsTeam Format: The specifics of the design process</b> .....	<b>8</b>
Overview of the KidsTeam Design Process.....	8
Specifics of the KidsTeam Design Process.....	9
Overview of the 5 Phases of an Individual Design Program Session.....	10
Specifics of the 5 Phases of an Individual Design Program Session.....	10
<b>Planning Your KidsTeam Process: Best practices</b> .....	<b>13</b>
Scheduling a Time for Your Program Sessions.....	13
Planning for Varied Participation.....	14
Recommended Program Session Length.....	14
Preparation for Each Individual Design Program Session.....	14
Setting up Your Design Space.....	14
Supplies List.....	15
Activity Ideas for Phase 3: Design Time.....	15
<b>Additional Resources</b> .....	<b>16</b>
Background on KidsTeam and Designing Technology with and for Children.....	16
KidsTeam Examples.....	16
Activity Ideas and Design Techniques.....	17
<b>Bibliography</b> .....	<b>17</b>

## Welcome

Welcome to the KidsTeam Toolkit for public library Librarians! This resource toolkit draft is designed for you to use when leading KidsTeam design programs in your library with your youth library patrons. The contents are based on Zoe Skinner's master's thesis research, rooted in the previous works of Dr. Allison Druin and Dr. Greg Walsh, specifically Dr. Walsh's KidsTeam manual for librarians (Walsh, 2018/2020). Additionally, none of this work would be possible without the children, adults and librarians who participated in KidsTeam work over the years. Thank you for your insatiable curiosity and inspiration.

## Toolkit Purpose

KidsTeam is a human-centered design process. It positions children and adults as design partners in the creation of technology, products and services designed for children.

As a librarian, you yourself are already a human-centered designer! You often design and tailor programs based on the goals, wants and needs of your youth patrons.

The toolkit's overall purpose is:

**Provide tools for you to use when creating, planning and leading KidsTeam programs**

Below are some additional goals of this toolkit:

1. Provide a worksheet so you can tailor the KidsTeam program to your needs and goals
2. Visualize and explain the KidsTeam Process and 5 Phases
3. Link supplemental resources for further exploration

## Worksheet Purpose

The KidsTeam program is going to look different depending on the needs, goals and wants of your library branch and patrons. The goal of the Create Your Own KidsTeam Program Worksheet is to assist you in your planning process by providing the following templates:

1. Planning Your Program Timeline
2. Defining Your Design Challenge
3. Selecting Activities and the Question of the Day
4. Outlining the Specifics for Each Individual Program Session

All content in this Toolkit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

2

## [Co-Design with Children: A KidsTeam Toolkit for Librarians: Appendices]

**Worksheet: Create Your Own KidsTeam Program**

Welcome to the KidsTeam Program Worksheet! We are excited that you are considering bringing KidsTeam to your community. We hope that it will offer an opportunity for adults and children in your community to collaboratively design technologies and experiences that reflect the goals and needs of children (KidsTeam, n.d.).

For best results, fill out this worksheet alongside the KidsTeam Toolkit. The full Toolkit offers a more in depth look at the process and procedures of KidsTeam. The information is based on previous research working with KidsTeams in both the academic university and public library settings. Any references to the Toolkit will be under the headers and look like this: **Additional Resources**

**Planning Your Program Timeline**

When planning your program(s), you'll need to decide how many individual program sessions you will have and how much time in between each program. Past KidsTeam work in libraries have done a weekly format with 4-5 individual program sessions total.

**Desired Date(s) and Time(s) of KidsTeam Program(s):**

	Date	Time	Location
<b>Program Session</b>	<i>Consider how much time will be in between programs</i>	<i>Select a time when there will be a consistent group</i>	<i>Note if you'll have to use various locations in the library</i>
1			
2			
3			
4			

**Programming Planning Chart**

Time Before 1st Program	My Timeline	Example Timeline
3-4 Months		<i>Determine Design Challenge; Talk with customers about their interests and timing for programs</i>
2-3 Months		<i>Seek approval and put in formal request for the program</i>
1 Month		<i>Research design activities that could be used in program sessions</i>
2 Weeks		<i>Ensure space and supplies are secure</i>
Week Before		<i>Advertise the program and talk to children about participating; Gather snacks</i>

All content in this Toolkit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

### Preparing the Design Specific Activities

*Specifics of the KidsTeam Design Process*  
*Activity Examples*

### Goals for My KidsTeam Program

To help with planning the overall Design Challenge and individual design program sessions, think about what goals you want to achieve through KidsTeam. List them below:

Goal 1:

Goal 2:

Goal 3:

### Defining Your Design Challenge

*Specifics of the KidsTeam Design Process*

? ?  
? ? What is the design problem your group wants to solve together?

Our Design Challenge is:

### Selecting Your Activities and Questions of the Day

Next, it may be helpful to brainstorm potential Design Time Activities and Questions of the Day that you can use in your individual design program sessions. Each of the Design Time Activities should reflect the Design Stage they are associated with.

Below are the three Design Stages:

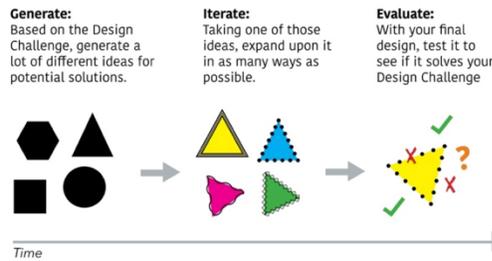


Figure 1: 3 Stages of the KidsTeam Design Process

All content in this Toolkit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

[Co-Design with Children: A KidsTeam Toolkit for Librarians: Appendices]

Refer to the Toolkit’s section on **Activity Ideas**, brainstorm some ideas for activities and a question you can ask the group that’s similar to the design topic:

Design Stage	Design Challenge Activity	Question of the Day
 Generate		
 Iterate		
 Evaluate		

**TIP:** It may help to think of past library program activities you’ve led that were engaging. Do any of them fit into the 3 Design Stages?

**Outlining the Specifics for Each Individual Program Session**

*Specifics of the 5 Phases of an Individual Design Program Session*

*Supplies List*

*Activity Ideas for Phase 3: Design Time*

Now that you’ve defined your Design Challenge and brainstormed some Activities and Questions of the Day, it’s time to outline the specifics of each individual program session and how they will flow together. Keep in mind as you create your outline, each individual program follows these 5 phases:



Figure 2: 5 Phases of each individual KidsTeam Program

All content in this Toolkit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

**KidsTeam Program Session Template**

This template is meant to be used for each of the individual program sessions. Since one session builds off the other, it will be helpful to fill out this template *after* you complete a program session in preparation for the next one. *Please note: The below is directly from Walsh's original KidsTeam manual (Walsh, 2018/2020).*

**Topic**

What is the overall design challenge you are trying to solve?  
What is the focus of this design session?

**Space & Time**

How much time is available for KidsTeam?  
Do you have a table for snacks?  
Do you have a place for circle time?  
Do you have a place for design time?  
Do you have a place and equipment for Big Ideas?

**Snack Time**

Are there any known dietary restrictions? Yes No  
Write the snacks you are planning to have at the KidsTeam session.

**Circle Time**

Think about the design session's focus. What will be your question of the day?

**Design Time**

Do you want this design session to be generative (new ideas), iterative (add to ideas), or evaluative (review prototyped ideas)?  
What activity or technique will you use?  
What supplies do you need?

**Big Ideas**

Where will you collect the Big Ideas (whiteboard, flip board, poster paper)?

**Tip:** It may help to make multiple copies of this sheet based on the number of program sessions you plan to host.

All content in this Toolkit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

6

## [Co-Design with Children: A KidsTeam Toolkit for Librarians: Appendices]

## KidsTeam Goals & Background

### Goals of KidsTeam

Every KidsTeam program has their own set of goals but, they follow the same principal of collaboratively designing technologies for and with children. Below are the general goals of conducting KidsTeam programs:

1. Exploring where children fit into the design process, specifically as an opportunity for children and adults to be design partners (Druin, 1999)
2. "Co-design technologies that are more relevant to children's interest and needs" (KidsTeam, n.d.)

TBD: Pictures of past KidsTeam creations

*And specifically for conducting KidsTeam in public libraries*

TBD: Pictures of past KidsTeam creations

3. Include more diverse voices in the design process (Walsh, 2018)

### KidsTeam Background: Children and adults designing together

KidsTeam is a design process created by Dr. Allison Druin over 20 years ago in which children ages 7-11 and adults collaboratively design new technologies for and with children. She created the *cooperative inquiry* design approach which explored the different roles children can have in the design process, specifically as "research partners" (Druin, 1999). Her work in conjunction with the University of Maryland's Human Computer Interaction Lab (HCIL) resulted in an intergenerational design team where children and adults are *design and research partners* (KidsTeam, n.d.). They've worked with a variety of partners from Nickelodeon to the National Parks Service (KidsTeam, n.d.). Check out the **Additional Resources** section for more background on their work and other KidsTeam initiatives around the USA.

### KidsTeam in Public Libraries: Adapting the process for libraries

Recognizing an opportunity to conduct the KidsTeam design process in the community, Dr. Greg Walsh of University of Baltimore brought KidsTeam to public libraries in Baltimore City. However, he adapted the process format, specifically reducing the length of the design process from months to weeks in hopes of including more diverse voices in the design process (Walsh, 2018). This toolkit is an adaptation of his original manual he created for public library librarians to use if they wanted to conduct KidsTeam design programs on their own.

All content in this Toolkit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

[Co-Design with Children: A KidsTeam Toolkit for Librarians: Appendices]

**KidsTeam Format: The specifics of the design process**

**Overview of the KidsTeam Design Process**

KidsTeam is a design process for children ages ~7-11 years old and adults to creatively solve problems together. It's been used for creating and developing technologies, services, etc. with and for children. The adapted process designed for libraries (Walsh, 2018) has the following features:

- Shortened multi-program format that builds from one program to the next (4-5 program sessions total)
- 3 Design Stages: Generate, Iterate and Evaluate
- 5 Phases within each Design Stage

Below is an overview of the KidsTeam process structured as a multi-week program:

**KidsTeam Process for Multi-Week Programs**

Collaborative creative problem solving with children and adults

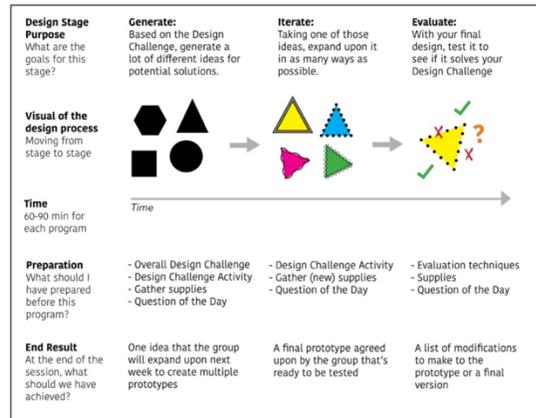


Figure 3: Overview of the multi-week KidsTeam process

**Tip:** Think of the steps above as a framework for how you can create an engaging program for your youth patrons. They'll use their skills, experiences and unique talents to collaboratively create something with their peers and library staff. Parents are welcome too!

## [Co-Design with Children: A KidsTeam Toolkit for Librarians: Appendices]

121

<b>Specifics of the KidsTeam Design Process</b>
---

As you see above, there are 3 Design Stages in KidsTeam that help transform research into ideas and those ideas into solutions:

- Generate – create ideas
- Iterate – expand on those ideas
- Evaluate – test and modify ideas

In order to prepare for these 3 stages, you'll first need to come up with a Design Challenge. This is the design problem your group wants to solve through these stages.

**Preparation: Define your Design Challenge**

**Goal:** Define what problem the group will solve

**Preparation:** Research; Think about the interests of your patrons, yourself and your library's programming themes

**End Result:** A clearly defined design problem the group wants to solve

Once the Design Challenge is decided, the next three program sessions will follow this general order:

**Stage 1: Generation**

**Goal:** Creating lots of different ideas

**Preparation:** Design Activity, Supplies & Question of the Day

**End Result:** One idea that the group can expand upon next session to create multiple low-tech prototypes

**Stage 2: Iteration**

**Goal:** Expanding on one of those ideas in multiple ways

**Preparation:** Design Activity, Supplies & Question of the Day

**End Result:** A final prototype agreed upon by the group that's ready to be tested

**Stage 3: Evaluation**

**Goal:** Testing the idea to see if it is the right solution for the original design problem

**Preparation:** Design Activity, Supplies & Question of the Day

**End Result:** A final version of the prototype or list of modifications

All content in this Toolkit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

9

**Tip:** You may find that you need to repeat some of these stages or go back and do more research as a group before moving onto the next stage. This is why you may have 4 or 5 program sessions.

#### Overview of the 5 Phases of an Individual Design Program Session

Within each of these 3 Design Stages, there are 5 Phases that each individual KidsTeam program session goes through. These phases build off each other to address one aspect of a design problem per program session (Walsh, 2018/2020). No matter how many program sessions you host, every session should follow these 5 phases in order.



Figure 4: 5 phases of an individual KidsTeam program session

#### Specifics of the 5 Phases of an Individual Design Program Session

As a reminder, these 5 phases work together to help answer a specific design problem that you and the group have identified. Below are the specifics of each phase including suggested phase length and key components.

*Please note: The below descriptions of each phase are directly from Walsh's original KidsTeam manual (Walsh, 2018/2020). Anything in bold or italics has been added by this author for emphasis. Please also use "design session" and "design program session" interchangeably.*

#### 0 Arrival

30 min – 1 hour before program session

##### Set Up; Advertising

"Depending on your program, arrival can be treated as an event by itself, or can just be taken for granted if the participants are already at the location. For example, your program may be a once a week program that draws children who are not normally at the library after school. If this is the case, you need to create clear instructions of where parents can drop children off for these programs. You may want to create a sign-in station for children and caregivers to register when they attend. You should need to give clear instructions on where to park, or how to arrive at your location via public transit." (Walsh, 2018/2020).

## 1 Snack Time

15 min

### Snacks

"Snack time is the first phase of the KidsTeam design process. During this time, the entire design team **(children and adults) participate by eating the snacks**. When choosing snacks, it's important to understand the cultural dietary restrictions for your area as well as any special needs indicated by participants before the design sessions began. Popcorn is an excellent snack because it contains no dairy, is vegan, and has no sugar beyond those naturally occurring in the food. We've had good luck with applesauce, goldfish crackers, Saltines, and granola bars. The easiest drink to serve is water. We've found that children that participate in these design sessions are aware of the environmental damage that plastic plays, so, we suggest you use paper cups and large containers of water or perhaps filtered water from a pitcher.

**Before your design team arrives, it is important to set up for snack time.** It has been shown that children and adults perform better when they are not hungry. This is one of two reasons we have snack time as part of KidsTeam. Besides feeding the design team, Snack time works as a way to level the power dynamic that both the children and adults are accustomed to especially if the design session is held after school." (Walsh, 2018/2020).

## 2 Circle Time

15 min

### Question of the Day; Introductions

"After about 15 minutes of snack time, it is time for circle time to begin. Much like snack time having two uses, circle time also performs two tasks: **continuing to break down power structures**, and **focusing the discussion on the design problem at hand**.

Ask all of the participants including the adults to sit in a circle on the floor. It's best to break up any groups of friends or siblings. Try to have adults spread out through the circle so that it doesn't seem like they're all sitting together.

Once everybody is seated, you can announce the question of the day. The **question of the day is an open-ended question** that is easily answerable by the participants but that has something to do with the focus of the day's design session. For example, if your design session is focused on a new children's space in your library, the question of the day might be "where is your favorite place to read?"

Now that everybody knows the question of the day you can begin doing **introductions**. The familiarity your KidsTeam has with the process and each other can determine how you want to handle the introductions. Traditionally, each participant says their name their age how many times or how long they've been a participant in KidsTeam and answers the question of the day. It is imperative that the **adults use their first names** and announced varied as well. Using first names and been open about age is one of the ways in which children come to see the design group as being mortal equal then in school where they use proper titles and the age of adults is rarely mentioned." (Walsh, 2018/2020).

All content in this Toolkit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

11

### 3 Design Time

30 min

**Low-tech Prototyping; "Bags of Stuff"; Design Activities**

"Design time is the phase which new ideas are created and prototypes are evaluated. There are an array of multiple techniques that can be utilized in this phase. The techniques used should be kid friendly and enable creative expression but are also accessible by adults. In most cases, the idea of building and prototyping isn't to create a high-fidelity version of something, instead the idea is to create something that can be explained and iterated upon by other members of the group. You can think of the design phase techniques as a range on a spectrum where one side is generative and on the other side is evaluative.

In our experience, one of the most popular forms of **low-tech prototyping** is called "**bags of stuff**". This technique relies on art supplies as well as household objects for intergenerational design groups to build prototypes with. This technique is powerful because it enables children to design new things with materials that they're familiar with from school and at home. In this technique, there's not much training required for the designers because of this familiarity.

Another form of low-tech prototyping popular with both adults and children is **drawing**. Some adults are self-conscious about drawing and instead will try and write words on paper. It's important to reassure the designers that the quality of the drawing isn't important but instead the story that they're trying to tell. Instead of drawing, groups could use old magazines or advertisements and cut out people and things to use in their designs. Drawing can also be made more engaging by using different types of materials such as large poster boards or rolls of butcher's paper.

As prototypes move along in the design process it is important to continue to iterate upon those prototypes and the best technique for this is one called "**likes, dislikes, and design ideas**". In this technique a prototype is presented to the group the larger design team splits into smaller teams, and using sticky notes, writes either a like, a dislike, or design idea onto a sticky note. Each sticky can only contain one thing and the adult members of the group should help the child members in writing.

There are almost an infinite number of techniques that can be used during the design time phase." (Walsh, 2018/2020). Refer to the **Activity Ideas** and **Additional Resources** sections for more information around specific activities and techniques.

### 4 Big Ideas

15 – 30 min

**Presenting Ideas; Key Concepts; Common Themes; Analysis and Synthesis**

"Once the design session is done, it is time to gather the ideas in the big ideas phase. The best way to do this is to have either a white board or a flip chart in one area of the design space. Invite the design teams over to the area by this board and ask for a volunteer to **talk about their prototype**. Have the group described their prototype and, as they are describing it, a researcher or librarian writes key

concepts on the board as they're being described. Each group presents their ideas and it is helpful if each of you each of the groups is represented in a different color.

After all of the groups present their ideas, as a group to discuss what are some of the **common ideas** between the groups and what are some of the very **unique ideas** generated by the groups. Sometimes it is helpful if you put symbols next to the ideas and underlined or circle unique ideas.

Once the design session is over and all the child participants have left, it's time for the design group or design researchers to look at the ideas generated in the big ideas phase and collect what's been synthesized on the board. This **analysis and synthesis** becomes the most important artifact from this design session. In other words, this is the main output for the session." (Walsh, 2018/2020).

## 5 Clean Up

5 – 10 min

### Cleaning and Organizing

"This is not an important phase when it comes to the design session, but it is very important when it comes to keeping the space clean. It is helpful to have all of the designers help clean up the space including the art supplies, sticky notes, large pieces of paper, crayons or markers. Space at this time is also extremely helpful to cleanup food or drinks snack time and make sure the space is clean for the next users of that room" (Walsh, 2018/2020).

### Tips:

1. To see an example of how the whole process works in action, take a look at Dr. Greg Walsh's article describing the anatomy of a KidsTeam design session:  
<https://mdsoar.org/bitstream/handle/11603/7853/Anatomy%20of%20a%20Design.pdf?sequence=1&isAllowed=y>
2. After each program session, it may be helpful to spend time reflecting on both the concepts discussed and the process. Ask yourself: What went well? What needs adjusting? Is there something the group really enjoyed?

## Planning Your KidsTeam Process: Best practices

Here are some additional things to consider when creating a KidsTeam Program for your library.

### Scheduling a Time for Your Program Sessions

"An intergenerational design group should meet at a convenient time for both children and adults in the neighborhood. Depending on the focus of your inter-generational design group, you may want to have design sessions weekdays after school during the school year, or on weekends. Design sessions

All content in this Toolkit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

13

## [Co-Design with Children: A KidsTeam Toolkit for Librarians: Appendices]

can also occur in the summertime as part of a larger, long-form camp experience at a library" (Walsh, 2018/2020).

#### Planning for Varied Participation

"[KidsTeam] allow[s] children to come and go during the activity much like the library programs we've observed over time" (Walsh, 2018/2020). It is not uncommon for new children to attend only one KidsTeam program session or participate in one of the later sessions. We recommend giving an overview of the whole process and the Design Challenge at the beginning of each individual program session.

#### Recommended Program Session Length

**60 - 90 minutes.** *This doesn't include preparation time or clean up.*

"Design sessions should be no longer the 90 minutes. We have found that anywhere from one hour to 1 1/2 hours is ideal because it allows for enough time to go through all the phases of the design process as well as let the participants really get into the activity. Anything shorter can seem rushed and anything longer runs the risk of all participants losing attention" (Walsh, 2018/2020).

#### Preparation for Each Individual Design Program Session

**Define the Design Challenge:** As mentioned earlier, there is one Design Challenge your group is trying to solve over the course of multiple program sessions. Either you can come up with the Design Challenge and present it to the group or you can use the first session to collectively brainstorm a Design Challenge. The challenge will guide the group activity for *Phase 3: Design Time*. See the **Activity Examples** at the end of this section for some examples.

**Question of the Day:** This should be a general question that relates to the Design Challenge with the purpose of getting the group to start thinking about the general topic of the challenge. This is meant to be discussed during *Phase 2: Circle Time*.

**Gather Supplies:** Since each program session builds off the next one, you may need to adjust your supplies each week. See the **Supplies List** at the end of this section for more details on the types of supplies used in previous KidsTeam programs.

#### Setting up Your Design Space

"The most important parts of determining the space to use is to make sure that it large enough to accommodate the participants in the design sessions. The space should contain a large table that everyone can sit around. It should also contain a large enough floor space that the designers can work in groups on the floor in their activities.

All content in this Toolkit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

## [Co-Design with Children: A KidsTeam Toolkit for Librarians: Appendices]

The space should be safe. This means the space should be highly visible from the outside, it should have safety exits in case of emergencies, and access to restrooms. The space should be inviting to children and adults but it shouldn't look like a cliché version of what adults think children would like.

TBD: Example of the ideal space layout for a KidsTeam program

The space should not be a location the children are familiar with in which a power dynamic usually exists. This means that rooms that remind participants of school should be avoided" (Walsh, 2018/2020).

### Supplies List

Referring to the above section on Setting Up the Design Space, you will need the following:

- A room or space that is visible and large enough to spread out but, won't infringe upon the regular happenings of the library
- Large Tables (1 – 2)
- Snacks and water – noting for allergies and dietary restrictions
- White board, large pieces of paper or another place to record the "Big Ideas" from your program session

During Design Time, KidsTeam often uses low-tech prototyping to help illuminate and test design concepts. This means that the final product the group creates may not exhibit its full functionality but, provides the general structure and interactive elements. This allows for "designers to explore different design options for user interaction and application tasks" (Brown et al., 2010).

To support low-tech prototyping, KidsTeam uses supplies inspired by the "Bags of Stuff" technique mentioned earlier. These bags consist of "arts and craft supplies such as yarn, Styrofoam shapes, glue, paper, markers, scissors, and cardboard rolls" (Walsh et al., 2013).

TBD: Image of "Bags of Stuff"

**Tip:** Think about the supplies you might have in your library that may be left over from other programs or items that you've been looking to put to use.

### Activity Ideas for Phase 3: Design Time

The supplies you choose may vary slightly depending on the design activity that you select for each program session. There are endless activities you can choose from and will likely depend on what your design challenge is and what stage of the design process you are in.

Below are just some examples KidsTeams and researchers designing with children have used in the past. They are examples taken from Co-designing a Digital Library (Druin et al., 2009) and the

All content in this Toolkit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

## [Co-Design with Children: A KidsTeam Toolkit for Librarians: Appendices]

128

Octoract paper on intergenerational participatory design techniques (Walsh et al., 2013). I've organized them by the Design Stage they can be applied to:

**Generate**

- Observe and conduct interviews
- ComicBoarding
- Big Paper
- Sketching/drawing
- Mixing Ideas (for younger groups, aged 5 - 6)

TBD: Images of select activities

**Iterate**

- Stickies – Likes, Dislikes and Design Ideas
- Storyboarding

TBD: Images of select activities

**Evaluate**

- Full group discussion session
- Conduct interviews

**Tip:** No matter what activity you choose, it is important to remember a key tenet of children and adults designing together: *idea elaboration*. "This is when one team member (adult or child) shares an idea with the team and it is extended by others... What matters is that both adults and children share in the process together" (Druin et al., 2009).

Refer to the **Additional Resources** section below for activity specifics, techniques and more examples.

### Additional Resources

Here is a shortlist of additional resources, broken down by category, to help supplement the information in this Toolkit.

### Background on KidsTeam and Designing Technology with and for Children

Cooperative Inquiry: Developing new technologies for children with children:

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.78.7430&rep=rep1&type=pdf>

KidsTeam: Co-Designing Children's Technologies with Children: <http://uxpamagazine.org/kidsteam/>

Child-Computer Interaction Book: <http://homepage.cs.uiowa.edu/~hourcade/book/child-computer-interaction-first-edition.pdf>

### KidsTeam Examples

Here are some examples of other Universities and KidsTeam initiatives around the USA:

All content in this Toolkit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

16

## [Co-Design with Children: A KidsTeam Toolkit for Librarians: Appendices]

129

Boise State University: <http://cs.boisestate.edu/~jfails/kidsteam/index.shtml>

University of Maryland, HCL: <https://hcl.umd.edu/children-as-design-partners/>  
 Video Example of University of Maryland iSchool Partnership with Pratt Institute of Industrial Design:  
<https://ischool.umd.edu/partners/kidsteam-youth-tech-design>

University of Washington: <https://www.kidsteam.ischool.uw.edu/kidsteam-projects>  
 University of Washington, Seattle Public Library and rural libraries partnership:  
<https://www.kidsteam.ischool.uw.edu/kidsteamuw-libraries>

### Activity Ideas and Design Techniques

Clear Panels: A Technique to Design Mobile Application Interactivity:  
<https://mdsoar.org/bitstream/handle/11603/7265/clear%20panels.pdf?sequence=1>

From Mongolia to New Zealand: Co-Designing and Deploying a Digital Library for the World's Children:  
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.645.6984&rep=rep1&type=pdf>

Layered Elaboration: A new technique for co-design with children: <http://www.cs.umd.edu/hcil/trs/2009-29/2009-29.pdf>

Octoract: An Eight-Dimensional Framework for Intergenerational Participatory Design Techniques (Also titled as: "FACIT PD")  
<https://mdsoar.org/bitstream/handle/11603/5464/FACIT%20PD%20Tech%20report.pdf?sequence=1>

Saga Walk: A big and active way to enable co-design: <https://medium.com/digital-whimsy-lab/saga-walk-a-new-way-to-enable-co-design-3d494b24b01e>

### Bibliography

Brown, Q., Bonsignore, E., Hatley, L., Druin, A., Walsh, G., Foss, E., Brewer, R., Hammer, J., & Golub, E. (2010).

Clear Panels: A technique to design mobile application interactivity. *Proceedings of the 8th ACM*

*Conference on Designing Interactive Systems*, 360–363. <https://doi.org/10.1145/1858171.1858237>

Druin, A. (1999). *Cooperative inquiry: Developing new technologies for children with children*. 592–599.

All content in this Toolkit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA).

17

## [Co-Design with Children: A KidsTeam Toolkit for Librarians: Appendices]

130

- Druin, Bederson, B. B., Rose, A., & Weeks, A. (2009). From New Zealand to Mongolia: Co-designing and deploying a digital library for the world's children. *Special Issue of Children, Youth and Environments: Children in Technological Environments: Interaction, Development, and Design*.
- KidsTeam: Children & Adults Working as Design Partners – HCIL*. (n.d.). Retrieved May 13, 2020, from <https://hcil.umd.edu/children-as-design-partners/>
- Walsh, G. (2020, April 13). *KidsTeam Manual*. <https://github.com/gxwalsh/kidsteam> (Original work published 2018)
- Walsh, G. (2018). Towards equity and equality in American co-design: A case study. *Proceedings of the 17th ACM Conference on Interaction Design and Children*, 434–440. <https://doi.org/10.1145/3202185.3202768>
- Walsh, G., Foss, E., Yip, J., & Druin, A. (2013). FACIT PD: A framework for analysis and creation of intergenerational techniques for participatory design. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 2893–2902. <https://doi.org/10.1145/2470654.2481400>

### Appendix D: Stage 3: Usability Assessment Questions

**Scenario 1:** You are interested in hosting a KidsTeam program with your youth library patrons at your library. Your library staff wants to design a new virtual STEAM program geared towards 7-11 year old's. It is 3 months before your desired program date. You open the toolkit to prepare.

#### **Task 1**

With 3 months before the program, you want to start planning out your timeline for the design sessions. Can you show me where you would look to find that information to start planning your timeline?

#### **Task 2A**

Next, you're trying to decide how many individual program sessions you want to have. Where would you find information on the different Design Stages?

#### **Task 2B**

You're looking to learn more about the Design Stage that focuses on "creating a lot of different ideas." Where can you find more details about this stage?

#### **Task 2C**

In order to create your own program based on the 3 Design Stages, there is a key preparation step. Where can you find more information about this step?

#### **Task 3A**

Great! You decide to host 4 individual program sessions in order to answer your Design Challenge. Next, you want a reminder about the phases of each individual KidsTeam program session. Can you tell me where you'd find information on each phase?

#### **Task 3B**

Can you navigate to where you would find information about the Phase where you ask the “Question of the Day”?

**Task 3C**

If you’re looking for what the goal of Phase 4: Big Ideas is, where would you find that information?

**Task 4**

Next you want to get an idea of the supplies you may need for your sessions. Where would you go to find a suggested supplies list?

**Scenario 2:** Now imagine it’s a week before your first program session, you want to plan out exactly what you need to have prepared.

**Task 5**

You think referring to past examples of KidsTeam work or examples of how a program session runs in full may be helpful. What section(s) of the toolkit/worksheet would you use to find this information?

**Task 6**

You’re now starting to explore activity ideas for the first program. Where would you look to find activity examples and inspiration for your Design Time?

**Task 7** (*open-ended question*)

Finally, you just completed your third program session! The children came up with some great prototypes. Now you’re preparing for your last program session in which the group will evaluate their creations together. How would you use the toolkit to plan for your final program session?

### Appendix E: Stage 3: Post-Assessment Interview Questions

Below are the general questions asked during the interview. Some participants provided answers to multiple questions at a time thus, the order and explicit asking of questions varied from participant to participant. I organized the questions into four categories.

#### **First Impressions & Overall Content Toolkit v.1**

1. What are your first impressions of the toolkit?
2. Were there any sections you feel are missing from the toolkit?
3. Were there terms or concepts that were difficult to understand?
4. Based on the information and tools provided, how confident do you feel in using this toolkit to facilitate a KidsTeam program? 1 being not confident - 5 being very confident
5. What would make you feel more confident?

#### **Structure and Organization**

1. How was the overall flow of toolkit?
2. Were the headings and subheadings helpful in finding the information you were looking for? If not, what would have made it clearer?
3. Were you expecting specific information to be highlighted that wasn't?

#### **Worksheet & Session Template**

2. How do you see yourself using the worksheet?
  - a. What elements seem the most helpful? The least?
3. Do think that you would use the KidsTeam Program Session Template in the worksheet in preparation for each individual program session?
  - a. Do you think this format will be helpful?

[Co-Design with Children: A KidsTeam Toolkit for Librarians: Appendices]

134

- b. If not, what information do you think would be helpful to have from program session to program session to help with planning?
4. Do you think the worksheet and toolkit complement each other?
  - a. If not, why?

**Distribution**

1. What format is best for utilizing this toolkit? One large file or separate files?
2. Should the Worksheet be separate from the Toolkit?