"We're Hinged. They're Not. It's in that Space that Creativity Happens:" Adult co-designers' perspectives on designing technology with children

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ABSTRACT

Children have been involved in technology co-design processes for several decades. While previous studies suggest potential benefits to child participants, research has not been conducted regarding the impact of these design methods on the adult designers involved in these processes. We conducted a retrospective online survey with 18 adults who have participated in co-design with children on technologies intended for children. Responses about their experiences, learnings, and recommendations for the process were synthesized. Overall, the participants perceived their experiences of partnering with children and hearing their perspectives to be valuable both personally and professionally as well as for the products' usability for children. Participants also noted some challenges or areas for improvement for the co-design process. Areas for future work may include a more formal study of the impacts of these experiences on adults and on the technologies developed via co-design with children.

CCS CONCEPTS

• **Human-centered computing - Human computer interaction (HCI)**; • **Social and professional topics - User characteristics - Age – Children**;

KEYWORDS

Co-design, Participatory Design

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1 INTRODUCTION

In a co-design process, end users are vital participants throughout the design process [1, 2]. They participate not only in using or testing technology and media once it is created, but also provide vital collaboration and input at all of the stages of the design process, from brainstorming and prototyping through iterating and building.

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Initially when children were involved in design processes, they were often involved as users or testers in the design process [3]. In these roles, children would offer input on technology once it had largely been conceived of and designed. Co-design with children, including children involved as ongoing informants and design partners, has been undertaken and studied over the past 25 years. In a co-design process, end users, in this case children, are more integrally involved in the design process over its entire course.

The current work focuses on work done using the Cooperative Inquiry method of co-design [1, 3, 4] which focuses on involving children as a part of the design process in equal partnership with adults. A Cooperative Inquiry design team tends to maintain relatively stable adult and child membership from year to year. Members strive to break down adult-child power barriers so that all members can have a voice in the design process. Children and adults work together throughout the design process using a variety of techniques including low-tech prototyping, sticky note critiquing, and layered elaboration [1]. The hallmark of Cooperative Inquiry is the long-term and stable participation of members leading to children's voices being integrally important in the design process.

For the purposes of the Interaction Design and Children community, we often think of children as the focal co-designers in our co-design processes. However, it is important to note that not only children are involved in these co-design processes. So too are adults, and these adults have different roles to play throughout the co-design process. Adults could be computer scientists interested in programming a new technology, or designers from a technology startup who are at an impasse on how a game should function. There are adults whose main roles are the administration and running of a co-design team, as well as adults interested in studying the psychology and development of team members during a co-design process.

While research has been done on the impacts that co-design processes have on children involved in them [5, 6], much less research has been done on the impacts that being a part of a co-design process can have on the adults involved. Some studies have investigated impacts on both children and adults [7]. In this work, Bossen et al. found that adult participants had positive experiences, including connecting with a wide network of adults, improving and reflecting on their teaching methods, increasing technology skills including new ways to use technology in their own professional practices, and some career path changes. However, there is not typically research that focuses on the experiences of adults as they move through a co-design process with children.

In the current work, we focused on the adults who have been or are currently involved in design processes and asked: What do

current and former adult co-designers report as their perceptions, learnings, challenges, and benefits of a co-design experience with children? This work in progress endeavors to set forth initial learnings from our exploration of these questions.

2 METHODS

2.1 Participants

Survey participants were adults who have worked with children as part of a co-design process currently or in the past while they were leading the design of a technology intended for children. The protocol for the study was IRB approved. Participants were recruited in collaboration with a network of researchers who are currently working with children using co-design methods, mostly Cooperative Inquiry. We reached out to our networks and to other researchers who were running co-design teams who could distribute the survey to those who met the criteria for participation. We had 18 participants (8 female, 10 male) complete the survey over a two-month period. The participants identified which years they had participated in a co-design process, which ranged from 1999 to the present, and the duration, which ranged from two months to 20 years. Five participants indicated that they are currently involved in co-design.

2.2 Survey Design

The survey was designed to gather thoughts and experiences of the participants with regard to the nature of their participation in co-design, their understandings or learnings from the experience, their thoughts on the value of the experience, how it impacted the ultimate technology design, and any challenges or improvements they would suggest to the co-design process. The survey was designed to take about 20 minutes to complete, and participants were compensated with a $15 gift card for their time. The survey was completed online through a Google Form.

3 RESULTS

Seven of the participants were affiliated with an industry organization – as opposed to an academic institution – when they participated in co-design. Many participants had been introduced to co-design as part of their graduate education. The types of technologies the adults were co-designing or had co-designed included child-facing websites, wearable technology, games, and authentication processes.

Because the majority of questions on the survey were open-ended, a thematic analysis was conducted to analyze the responses and identify common themes or ideas present in the data. Below we describe the type of answers shared and include illustrative quotes from the surveys to add richness and specificity to the descriptions.

3.1 Learnings and Understandings

From across the survey responses, several important findings about adults' perceptions of the co-design process emerged. The majority of participants noted that an important learning from the process was the need for gathering varied perspectives in the design process; this includes children's perspectives if they are the target users of the technology. More broadly, this could also include perspectives from communities outside of academia and industry. About half emphasized that participating in these methods defined or changed the way that they see the design process. Several participants noted that they took away specific co-design skills, including knowing which design techniques to use under what conditions, and how to create engaging co-design experiences. The skills mentioned by the adult design partners included the analytic skills required to quickly draw out common themes from a co-design session and create concrete objectives from the ideas being shared.

"I have grown personally and have learned from children throughout the years. It's hard to list all of the benefits but some include varied perspective, humility, spontaneity, improvisational skills, better abilities to see beyond what is being said and interpret deeper meaning, and more." - *University-affiliated researcher who has participated in and led co-design teams for 20 years*

Other understandings mentioned by participants included skills such as patience, communication, and empathy for children and other users.

3.2 Thoughts on Value

Many participants also commented on the value of the co-design process, which we asked them to define in whatever way they preferred. A majority of participants noted that the value of the co-design with children was that it improved the usability and ability of the product and its features to meet the needs of its intended users. Similarly, several participants noted that the final product would engage children more and get them more excited. Several others commented on the value of engaging children's creativity and their ability to challenge existing ways of making things without being hindered by the same barriers or limits that adults may have, and that this would lead to more unique ideas and end products that are "innovative." One designer noted how working with children helped them get beyond their more fixed conceptions of what kids would like:

"We would have created our own "adult" version of fun without understanding the inherent factors that made something fun for children. We're hinged. They're not. It's in that space that creativity happens." - *Technology designer from a major children's media company who participated in co-design for 3 years*

Several participants pointed out the value of having co-design skills in their "research toolbox" and that it led to career opportunities, including internships and jobs at large tech companies.

"Doing co-design with children helped me to build my skills as a researcher. Due to its flexible nature, it allowed me to play with different techniques and formats for research that have since translated into my wider capabilities as a user experience researcher; using many of these new techniques in non-participatory design studies." - *Technology designer from a major children's media company and university-based teams for 8 years*

A few participants even noted that they created similar programs internal to their organizations after learning the methods. One participant who represented a major children's media company noted the value of the method for "teaching execs how kids think."

3.3 How Co-Design Impacted the Technology

We also asked participants to reflect on how the technology was impacted by the co-design process and if they could share a design feature that might not have been developed otherwise. Generally, participants shared that children appreciate when products have surprises or randomness built in and that working with a group of different children allowed for more nuanced designs that worked for different ages and needs. Participants also shared some specific examples of how the children's perspectives were valuable to the design. For example, adults could better understand children's pain points when working with technology - in one case to create a graphics-based authentication mechanism to help children better remember their passwords. Another designer shared that to best design a privacy application for children you need to have an understanding of their perception of privacy and how to monitor and track it. One designer shared this design idea coming from very young children:

"A recent example was preschool children coming up with the idea of smart homes that synchronize with play (e.g., when it's nighttime during play, the lights dim)" - *University-affiliated researcher who has participated in and led co-design teams for 20 years*

3.4 Feedback on the Co-Design Process

We asked participants to identify any aspects of the co-design process that they would change, remove, or add. Participants shared a number of current challenges and suggestions. A couple of participants noted that they were concerned that the findings or ideas shared could be biased toward the small number of children who participated; similarly, another participant noted the challenge in recruiting a more diverse participation of children and families, sometimes as a result of barriers such as transportation to the session site. Others commented on the cooperative method and the need to help adults to understand that they are supposed to participate with the children, not just observe them. One participant noted that sometimes it can be hard not to get sidetracked by unrealistic ideas, though there may be a "seed of a relevant idea." A few participants commented on the desire for more time to engage in co-design and even the need for support for an "end-to-end design process."

"I needed a little more time to make the game more quality, so I'd have extended the timeline for my own need for perfection." - *School-based designer who participated in co-design for 2 months*

3.5 Recommending the Method to Other Designers

We asked participants if they would recommend a co-design process with children to other designers in the field. On a scale of 1 to 5, the average response was 4.7 with 13 out of 18 participants responding with a 5 and the others responding 4. We examined the responses about why the participants gave the rating they did. For those who gave a 5, responses mirrored the sentiments above around the value of the experience personally and professionally. Those who responded with a 4 provided some different insights including:

Some situations may not afford the bandwidth and/or resources necessary to undertake co-design with children.

Relaying the business value of the investment can be challenging.

Reconciling the entertainment factor with the pedagogical elements required in a learning context can be challenging.

Co-design is one of many design methods and may be best suited when an open-ended exploration is required or when designing creativity support tools for children.

In order to implement effective co-design, it is essential to have adult design partners who know how to work with kids. Otherwise, the result could be a glut of ideas that aren't grounded in actual needs.

4 DISCUSSION

This work represents a first step in understanding the immediate and long-term benefits and challenges of adult technology designers engaging in co-design with children. Overall, adults' responses about their experiences were very positive, pointing to the myriad ways that the co-design process benefitted them and the resulting technology. Adults strongly valued the varied perspectives that co-designing with children offered and felt that the resulting products' usability and ability to meet children's needs was greatly improved.

Adults also noted personal benefits, such as learning more about the technology design process and developing interpersonal skills such as communication, empathy, and patience. Professional benefits included the value of these skills leading to new career opportunities, thus bringing these practices to the larger field. At the same time, adults identified challenges and areas for improvement, such as including more diverse voices on the co-design teams. Some researchers are already working on exploring and addressing these issues [8] though there is more to be done on this front. Others commented on the need for more time or more support throughout the design process, factors which are likely impacted by the overall resources available for this type of work and potential time constraints on the designers to complete prototypes of their products. However, avenues to provide more support generally for child-facing products may be to conduct workshops with designers on how to apply the ideas that came out of the co-design sessions or to create a community where they can continue the discussion together.

While this study provides an overview of adults' experiences, there are some limitations to the work. We had a relatively small sample of participants who were primarily recruited through snowball sampling; reaching outside of the current pool of participants may yield other important insights about the process. We also conducted a primarily retrospective survey (only five participants are presently co-designing) which could impact findings from those who are responding about an experience from years ago.

5 TAKEAWAYS AND NEXT STEPS

This research asked adult participants in co-design to reflect on their experiences and identify the specific impact those experiences had on their learning, their work, and the output of the process on technology. For the IDC community, the positive findings may encourage more designers to consider using these types of methods and including children as more active partners in their work.

In the future, we expect co-design processes to continue to evolve and take into account the needs and experiences of the participants

involved. For example, the co-design field has innovated in different ways including recently when many teams shifted to working online during the COVID pandemic [9]. This work showed that different teams evolved in different ways to navigate the challenge of non-co-located co-design. We imagine similarly that moving forward, teams will each evolve uniquely to meet the specific needs and characteristics of their unique circumstances. The ideas raised from our survey may point to other areas of innovation, for example to make it possible for more designers and children to participate in these experiences.

For future research, this work could be applied to design a more formal study of adults engaged in the design process, including longitudinal work to follow individual designers or interviews to study these topics in more depth and more frequently throughout the design process. Additionally, we do note some similarities in the personal benefits shared by adult design partners and the exploratory findings from research on the benefits to children [5]. Future research could consider if and how these findings map onto each other.

Longitudinal work could also be conducted to determine the impact on technology that was developed and examine how different features or affordances are received when the technology goes to market – even though, as one participant noted, it is difficult to pinpoint the benefits of an individual product without a comparative study. Broadly, it would be useful to increase awareness of the co-design process and its potential positive benefits on technology, including usability for children.

In conclusion, this work provides a strong first step in exploring the experiences of adult participants in co-design and furthering the research beyond the children engaged in these processes. It is our hope that research will continue in this realm on both populations.

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