

Contextual inquiry into children's reading working with children as research partners

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ABSTRACT

Too often, children's technology is designed without adequate user research. We suggest that research into children's use of technology can be dramatically improved not only by contextual inquiry, but by contextual inquiry that involves children themselves as research partners—as members of the research team. This presentation will discuss the methods and challenges involved in doing contextual inquiry into children's recreational and homework-based reading while working with children as research and design partners. Our focus will be on how others can use or adapt our methods.

INTRODUCTION

The HCI field includes numerous methodologies that bring technology users into the development process. In user-centered design, users may take the following roles: active partners (Bjerknes et al, eds., 1987; Greenbaum & Kyng, eds., 1991; Schuler & Namioka, eds., 1993), inspectors or testers (Nielsen, 1995; Nielsen & Mack, 1994), or research participants to be observed and/or interviewed (Beyer & Holtzblatt, 1998; Erickson & Stull, 1998; Holtzblatt & Jones, 1995). However, despite the growing value placed on user-centered design methodologies, users that are children are less commonly involved than adults (Druin, 1996; Druin et al, 1999). If children are involved at all, they are likely to be involved only for brief periods, often as technology testers in workshops or school settings (e.g., Loh et al, 1998; Oosterholt et al, 1996). However, such short periods of involvement appear to shortchange children's potential contribution to the design process (Druin et al., 1999; Scaife & Rogers, 1999).

Over the past seven years, Allison Druin at the Human Computer Interaction Lab (HCIL) at the University of Maryland College Park has refined a methodology for working with children as design partners in intergenerational, multidisciplinary teams (Druin et al., 1997, 1999, 1999b, 2001).

Druin calls this approach to creating new technologies for children, with children, cooperative inquiry. Cooperative inquiry includes three aspects of HCI practice: (1) a multidisciplinary partnership with children; (2) field research that emphasizes understanding context, activities, and artifacts; (3) iterative low-tech and high-tech prototyping.

As part of a three-year NSF research grant shared by the University of Baltimore and the HCIL, the University of Baltimore has developed its own research and design team composed of six children between the ages of 10-13 and six adults (two graduate students and three faculty from the University of Baltimore, and one graduate student from the University of Maryland). The Baltimore KidsTeam has been conducting contextual interviews with children ages 8-14, as a foundation for prototyping a new interface and new functionality for HCIL's International Children's Digital Library (www.icdlbooks.org; Hourcade et al., 2002) that would be appropriate for children ages 10-14.

Project Goals:

- Adapt Allison Druin's cooperative design methods to older children, ages 10-13
- Adapt the International Children's Digital Library (originally designed with and for children ages 6-11) to older children, in collaboration with children design partners
- Learn how to work with children as research partners through contextual inquiry

One of our first priorities was to gain a richer understanding of the needs and goals of older children. We quickly realized that the searching and browsing strategies and reading habits of older children were dramatically different from those of younger children. Older children also needed the library to support a new range of homework-related tasks. Thus, our first priority was to gain a solid contextual understanding of recreational and homework-based reading for children ages 9-14.

Because the KidsTeam includes both “short” and “tall” members, children become co-researchers and co-designers in planning and designing the form the digital library should take. This paper talks about how the inclusion of children on the research team changes the process and efficacy of contextual inquiry into children as technology users.

METHODS:

Our KidsTeam has made three visits to public libraries and eight visits to homes to interview and observe children browsing, choosing, and reading books. We had two research goals: (1) to observe goals, tasks, environments, tools, and artifacts, triggers, and coordination strategies that affect children’s strategies for browsing, choosing, reading, and otherwise using books, in support of our redesign of the digital library; (2) to better understand how the inclusion of children on the research team changes the contextual inquiry process.

Following Druin’s lead at the University of Maryland HCIL, the SIAT KidsTeam created an on-going partnership with a selected group of children rather than work with many different children over short periods of time. The goal is for children to become research and design partners whom adult researchers come to know and respect rather than for children to be used as objects of research or testing. Together, children and adults gather field data, initiate ideas, test, and develop new prototypes.

The University of Baltimore’s KidsTeam consists of six children between the ages of 10-13 and six adults (two graduate students and three faculty from the University of Baltimore, and one graduate student from the University of Maryland).

The team met for three hours on most Saturdays between 9/21/02 and 5/10/03, except when school was not in session. We use two rooms at the University of Baltimore, one small room with six computers and a larger room with tables and a whiteboard for team activities. The team brainstormed design requirements and ideas, performed contextual interviews, built low-fidelity prototypes using art materials, and created electronic proofs-of-concept using Flash. We found that using rapid low-fidelity prototyping and small design activities such as Flash movies and personal Web sites help child design partners develop a sense of ownership and excitement about their design ideas.

To prepare for the contextual interviews, child researchers helped to develop the field guides, practiced interviewing, talked about the theory of contextual inquiry, and learned how to use the video cameras. After the interviews, both child and adult researchers reflected about what they saw,



what was surprising, what was confusing, and what was expected. Based on sticky-note sessions, the SIAT KidsTeam revised their field guides and planned additional contextual interviews. Through this research, the team worked to identify design opportunities and challenges for prototyping a new interface and new functionality for the digital library.

The team performed 29 contextual interviews between Oct 2002 and April 2003.

We experimented with a range of strategies for performing the interviews:

- Children asking all the questions
- One child and one adult asking questions (the child asked the main questions, the adult asked follow-up questions as desired)
- Adults asking questions and children running the videocamera, making sketches, and chiming in as desired
- Adults only (some with prior KidsTeam experience, some with no prior experience working with children as partners)



Everyone in the interview, children and adults, took notes. Children sometimes sketched their observations rather than taking text notes. After the interviews, both children and adults reflected on what they saw, wrote down observations, grouped observations in sticky note sessions, and generated design ideas for the digital library prototype. (Prototypes were then brainstormed using art materials and paper sketches, drafted in Flash by the child design partners with adults as technical advisors, then coded by adults.)

Summary of interviews and participants

Library interviews (at the Enoch Pratt Free Library in Baltimore, Maryland)

- 13 interviews with 1-2 kids and 1-3 adults per team (8 interviews on 26 Oct 02, 5 interviews on 23 Nov 02)
 - 5 female participants, ages 14-15
 - 7 male participants, ages 8-15
- 7 interviews with adult researchers only (27 Mar 03)
 - 4 female participants, ages 10-12
 - 3 male participants, age 10

Home interviews

- 10 interviews with 1-2 kids and 1-3 adults per team (16 Nov 02, 7 Mar 02, 26 Apr 03)
 - 7 female participants, ages 8-14
 - 8 male participants, age 14

How participants were recruited:

Recruiting child participants for contextual interviews involves issues of trust and availability, as discussed in the section on challenges.

Visits to the library were arranged with the library in advance. On two separate library visits, we relied on casual visitors to the library, and asked accompanying parents for permission to interview and videotape. On a third occasion, arrangements were made to meet a 5th grade teacher and her class at the library to ask class members about their current research project; no audio or video recording was made of these interviews.

Our participants for home visits were recruited through friends and colleagues. One participant was recruited through a referral from a librarian, but we were not given permission to videotape that interview.

Challenges

- Both children and adults need to learn new roles and interaction patterns in order to work together as design and research partners. Adults tend to want to be in charge. Children tend to go into “school” mode. Learning to set aside old hierarchies and old patterns requires time and effort. Both adults and children must practice in order to listen carefully, share ideas, and build shared research and design goals.
- Child research partners (and adults) need time to develop note-taking and observational skills. We prepared for our visits with a practice activity, in which teams of adults and children observed the making of a peanut-butter and jelly sandwich by several different people, then discussed their observations and translated these into design implications. However, the experience of trying to design actual prototypes for the digital library based on our first round of contextual interviews dramatically increased the tendency to ask good follow-up questions in subsequent interviews (for adults as well as for children). Iteration of the research and design cycle seemed key to success.
- Topics as basic as trust, consent forms, and paying an honorarium have their own particular challenges when doing contextual interviews with children. For example, children cannot read long printed consent forms and cannot legally sign consent forms—parents must do so. However, children need to understand the terms of the consent forms through discussion and verbal agreement. Children are typically willing to participate in interviews without payment, but may enjoy receiving a book or food. Gifts have to be cleared with parents in advance. (KidsTeam members receive a “technology gift” at the end of a year’s participation on the team.)
- Taping video and audio during usability sessions with child participants is clearly problematic. Interviews in public spaces such as schools and libraries should not be recorded or photographed unless parents are present. Interviews in homes can be taped with parental consent. However, parents may have extra concerns about confidentiality and use of research results. If children are videotaped, their comfort level can be increased by providing them with an opportunity to use the camera themselves for a few minutes. A child researcher should show them how the camera works. Then make sure the camera doesn’t become a distraction by having the camera operator stay well in the background.



- Interviews with children must absolutely be on site in order to stay concrete and productive. Children are not usually reflective. In a library or at the child's home, the research team can ask concrete questions such as "Can you show me a book that you like? How did you find this book? What do you like about it?"
- Creating tasks and questionnaire instruments for children presents new challenges. For example, child users typically need to have all questions read aloud. But in our case, these questions might be read out loud by either adult researchers or child researchers. Thus, the field guide needs to be written both for and to children.
- During the contextual interview, the research team must work hard to gain the trust of the child users, and to build rapport so that the child feels free to talk. Rushing too quickly into the interview itself is counterproductive. Child researchers in particular may be so excited to do the research that they begin too quickly, before the participant feels comfortable.
- Recruiting child users can be much more difficult and time-consuming than user researchers are accustomed to. Friends and family, church or community organizations, or business colleagues are a good first source of participants. Libraries and schools are justifiably protective of their child constituencies, so it can take time to gain access to children at these public spaces. In our recruiting, we found it helpful to invite parents to look at our team's website (iat.ubalt.edu/kidsteam) and at the ICDL (www.icdlbooks.org). We always shared a detailed overview of what would happen. In some cases, we invited parents to visit the KidsTeam (none of them did), or invited children to visit the KidsTeam (several did).

- Just as in more traditional contextual interviews, it is very important to monitor the child participant's level of comfort during the interview. Both children and adult researchers need to be sensitive to cues that their participant is



uncomfortable or fatigued. Often moving on to a new area of inquiry or a new location will restore the participant's interest, but also be prepared to end the interview early.

Benefits



- If given the opportunity, the child researchers can share mutual excitement about the research topic with the child users, dramatically increasing the amount of information and the realism of the observed behaviors. These moments of connection between the child researchers and child users can also be a useful signal to adults to pay more attention to observations that may not have seemed significant.

- Child participants in the contextual interviews loved being the focus of attention, felt an increased connection to technology, and clamored for continued involvement on or with the KidsTeam. For example, Diana (14 yrs) sent several follow-up emails to Kathryn adding additional details and examples about her reading and research assignments.
- Child researchers on the KidsTeam became increasingly engaged and effective researchers as well as more productive designers. They developed a sense of ownership of the technology, and according to parents also felt an increasing sense of empowerment, confidence, and articulateness in other environments (school, home) as well as during KidsTeam. Making the transition to the roles of designers/researchers was challenging, but the interplay between research and design was clearly productive. After trying to design based on research results, child researchers made a natural transition to asking better questions and more follow-up questions during contextual visits. They became hungry for the answers.
- Adult researchers who worked with children as co-designers and co-researchers found a pathway into the child's world and developed a much clearer sense of what matters to children about their process and what their goals are. During the KidsTeam interviews, adults had help from their "short" partners in identifying which details mattered most. By comparison, we did one set of interviews with adults only, some of whom were members of KidsTeam and some who were not. Adults who had not previously worked with "short" partners were markedly less effective when doing contextual interviews with 10-yr-olds than those who had worked with child research partners.

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