Playing together: The importance of joint engagement in the design of technology for children

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Abstract
In the design of technology for children, many products focus on providing content that is both engaging

and appropriate for children at a given age and developmental stage. However, less attention is paid to the *context* in which children tend to engage with digital products. When focusing on children age 13 and younger, context often includes social interaction with parents, caregivers, and friends, which provides many opportunities to design digital experiences that support co-play and joint media engagement (JME).

In this workshop, we will be discussing real world case studies, as well as theoretical approaches used by researchers, designers, and academics to design technology for children that includes and fosters co-play and JME experiences. Our discussion will be centered not only on understanding *what* are co-engagement experiences, but also *how* these are produced and *why* these are important for the child end user. The expected outcome of the workshop will be a set of principles, examples, and guidelines for digital media developers to consider when designing rich digital experiences that take into consideration not only the child, but the context for engagement as well.

Author Keywords
Joint media engagement; co-engagement; children; interaction design

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction
Consider the following (fictional) scenarios:

Scenario 1:
Noah heard about the new Pokemon GO game from his friends at school and immediately downloaded it. As an 8-year-old, he uses his dad's old phone to play games after school or during the weekends. His aunt is visiting, and he asked her to download the game on her own phone so he could teach her how to use it, and catch Pokemons together while they are out spending time together.

Scenario 2:
Tomas used to play long hours of Super Mario Bros games on the Nintendo 64 when he was a kid. It's still his favorite game ever, and he was very excited to download the new mobile version as soon as it came out. This was also an opportunity to play with his 9-year-old son, and share an experience together. Tomas and his son each acquired the game on a separate device and spent afternoons sitting side by side completing each level and discussing strategies.

Scenario 3:
Ana's 11-year-old daughter loves to play Candy Crush Saga and is constantly talking about it with her friends. Ana decided to download the game on her phone and start playing as an opportunity to bond and

connect with her daughter. She sometimes asks her daughter for help, even if she doesn't really need it.

Scenario 4:
Sara often lets her 6-year-old son and 3-year-old daughter play games and watch videos on her old tablet while she cooks dinner. Her kids have to share the tablet so they take turns and often fight over who gets to play first or what to watch. A family friend told Sara about the game Sago Mini Doodlecast. When Sara's kids tried the app, they worked together on the drawings and enjoyed recording their voices. They were also excited to share what they made together with Sara.

Technology use by children comes in many different facets, which are often not by design. The scenarios above are examples of case studies we have come across during our own research and practice, and represent different ways in which parents and kids are using mobile games to enrich both their digital and real-life experiences. Suddenly, mobile games are not only a way for isolated users to spend free time, but become instruments for social bonding and keeping abreast of each other's interests [8]. In fact, recent research shows that playing digital games together is growing in popularity, particularly among families with children age 4-10 [14]. When games are shared with someone the child cares about, the experience of the game itself becomes much more enriching and memorable [9].

When developing media for children, these unexpected usage patterns and emerging relationships tend to

be a novelty for the product makers, as these are generally not taken into account when developing the technology itself [12]. However, the topics of co-play, JME, and taking into account the context in which children use technology, are all recently emerging as vital considerations for the field (e.g., [3, 9-10, 12, 13-16]). This workshop aims to take an introspective look at these topics as it relates to the design of technology for children between the ages of 2 and 13 years.

In her book Screen Time, Lisa Guernsey, writes about the importance of considering the three *C*s -- the individual *child, content, and context* -- when selecting, using, and developing digital media with and for young children [6]. In 2012, the Fred Rogers Center used Guernsey's three Cs to inform their Framework for Quality, which is meant to provide guidance for parents, educators, and media creators on the quality of digital media [5]. According to their framework, quality in digital media for young children should take into account the following:

> ***Child:*** *The distinct cognitive abilities, physical abilities, social-emotional needs, aptitudes, and interest of individual children, at different developmental stages should be considered.*
> ***Content:*** *The intent of the content should be clear -- to educate, introduce new information, develop particular skills, and/or entertain.*
> ***Context:*** *Especially for children age 5 and younger, the media product should encourage joint engagement. For older children, interactivity and engagement with the media product, including the engagement of children as creators of content should be a priority [5, pp. 1-2].*

Although the three Cs are the same in terms of their level of importance, *context* tends to be a more nebulous concept to grasp and to design for. What are some ways in which we can define *context* when designing for children of different ages, and why is this important? While this is one of the questions we wish to discuss further in the workshop, what we do know from decades of research on television and young children, as well as emerging research on children's use of digital media, is that context matters because:

> ***Relationships Matter****: ...young children learn best in the context of interactions and relationships with tuned-in, responsive, and caring adults.*
>
> ***Joint Engagement Matters****: ...adult/child interactions are key to language learning, and this is also true when using media with children. Reading a book or playing with an app leads to more learning when adults and children share the experience* [4, p. 27].

Using media together supports learning, so technology should be used to support and strengthen adult/child relationships and promote joint engagement [3-4, 12, 16].

When purposefully including context as a design parameter for the design of technology for children, product developers can aspire to not only create engaging games, toys, books, etc., but *meaningful experiences and connections* [12]. These experiences are joint media experiences, defined by Guersney and Levine as “when any two or more people -- parents and child, siblings, or peers -- are looking at the

same media at the same time, are involved in the content together, and are prompted by what they are seeing to interact with each other and bring more meaning to what they are watching or doing" [7, pg. 171].

Over the last 5 years, field leaders from organizations such as The Joan Ganz Cooney Center, The Fred Rogers Center, and the TEC Center at Erikson Institute have produced a number of publications that provide insight into the context of conjoint technology usage and suggests various design strategies for encouraging co-engagement, including [1-17]:

- Think of experiences that parents and children can play or use together, or foster family teamwork.
- Support co-play by providing suggestions for parents on how to play together.
- Create content that appeals and challenges both kids and parents.
- Connect in-app learning to the real world
- Extend play beyond the screen.
- Appeal to multiple generations.
- Provide opportunities for users to develop or grow through participation (e.g., leveling up).
- Offer related real-world activities.
- Have content that revolves around children's existing interests, not prescribed topics.
- Consider the types of gameplay kids and adults enjoy the most
- Provide users with ways to assist and expand on the educational benefits of media.
- Enable co-creation.

- Allow for varying degrees of parental involvement.
- Encourage communication with family members, caregivers, or friends.
- Connect to real-life experiences.
- Ensure UI is simple enough that is does not distract users from interacting with each other or content.

These insights, as well as topics outlined in this paper will provide the starting point for a much more in-depth discussion regarding how to design for JME. During the workshop, we wish to expand on a) the meaning of JME, b) what constitutes successful implementations of these experiences on the design of technology for children, c) why are these important for children as end users, and d) best practices on how to implement them.

Topics of Discussion

The goal of this workshop is to bring together researchers, designers, academics, and media developers, who envision, design, create and study technologies for children. We would like to build a community to expand possible guidelines and design principles to foster co-engagement experiences on the design of technology for children.

- How should we design digital products for children that foster co-engagement experiences?
- How should we cater for the needs of multiple types of possible users?
- How do co-engagement experiences manifest within different ages and developmental stages?

- What are examples of successful co-engagement experiences and why?
- How do co-engagement experiences bring more meaning to technology products for children? Why are they important?

Workshop Outcomes

The outcome of the workshop will be a whitepaper and potentially a journal publication with a set of principles, best practices and case studies that should be considered when designing technology for children that foster co-engagement experiences.

Structure Of Workshop

This half day workshop will include activities centered on addressing the issues mentioned above. Select workshop attendees will present their research, design work, and/or selection of examples focusing on the topic of the workshop and the questions of interest. This will be followed by breakout sessions for attendees to discuss the open questions in small groups and share the learning with the entire group. After the breakout sessions, attendees will come together to discuss design principles and best practices for designing technologies for children that foster co-engagement experiences.

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