Introduction
Today’s children are growing up in the digital age—a time when so many aspects of life, from social interaction and communication, to working, playing, and learning, may be exclusively conducted through, or assisted by, technology. What does this mean for children, whose early direct experiences with the physical world are critical to their cognitive, physical, linguistic and social-emotional development? This paper seeks to explore what is currently known about the impact of technology on children’s lives and to establish a clear position on the use of technology in our museum space.

Defining Technology
The position we will define in this paper specifically addresses technology as it intersects with the direct visitor experience—not technology that is used to support museum administrative processes or communication and engagement beyond the walls of the museum, such as social media and digital marketing. We hold it as a given that effective technology can and should be used as a tool to support these latter-mentioned functions. Additionally, technology addressed in this paper is specifically digital technology and interactive media—which includes software programs, apps, screen-based programming, the Internet and other forms of interactive and online content.

Since technology of this kind evolves so quickly, we do not seek to define particular “types” of technology that we will or will not utilize in our experiences. Instead, this paper will identify a set of
criteria that will help the museum make informed decisions over time about available technology and its appropriateness for our practice.

Furthermore, this paper does not seek to make broad recommendations regarding the use of technology in children’s lives beyond our walls. As a museum, our position is concerned with the unique condition of our setting: we serve over 400,000 visitors per year, and often do not know individual visitor’s backgrounds, prior knowledge, needs, abilities, or experiences with technology. What might be a very appropriate use of technology with children in a day-to-day classroom or home setting where they have personalized guidance from a familiar adult might simply not be possible or appropriate in CCM’s space.

Impact of Technology
While over 40 years of research on technology and children (particularly the impact of television) exists, research on the impact of interactive digital media is only now emerging. Several organizations dedicated to the health, education, and well-being of children, including NAEYC, the Fred Rogers Center, \(^1\) and the American Academy of Pediatrics\(^2\) have made recommendations stating there should be no passive use of technology (i.e. watching screens) for 0-2 year olds, with the exception of live video-chatting with a responsive adult, and that passive use of technology for 2-5 year olds should be limited. Taken together, this age bracket makes up more than half of CCM’s visiting child audience.

Despite lingering questions about the impact of technology on children’s healthy development, their access to and time spent using technology seems to be ever-increasing. A study conducted by the Kaiser Foundation in 2010 found that children between the ages of eight and 18 spend more than 10.5 hours a day with digital technologies, when the use of more than one digital device at a time is taken into account. The youngest children in that study, those between the ages of 8 and 10 (and falling within CCM’s typical visiting audience), spent an average of 7 hours 51 minutes a day using technology.\(^3\)

Taken together, these sources suggest that passive use of technology 1) is developmentally inappropriate for over half of our visiting child audience (0-5 yrs), and 2) already plays a dominant role in the daily experience of many children in the older segment of our child audience (8-10 yrs).

Still, we must take a more nuanced view of the issues than a mere disapproval of passive technology. As previously stated, we recognize that technology is wide-ranging in its forms and functions. We acknowledge that effective use of technology can provide opportunities for meaningful interactions. As such,

---

\(^1\) Fred Rogers Center
\(^2\) American Academy of Pediatrics
\(^3\) Kaiser Foundation
we must consider both the potentials of technology to engage children and families, as well as the challenges and obstacles it presents.

CCM staff members’ own observations of technology usage both within CCM, as well as in other public spaces and learning environments (other museums, libraries, schools, learning centers), includes a range of perceived impacts. Note: Observations include technology furnished by the institution as well as technology brought by visitors.

Observed positive qualities include:

- enabling visitors to document and reflect on their experience (become media creators)
- inspiring face to face communication; prompting conversation; encouraging joint attention or social engagement
- illuminating a process or providing information that enhances an experience
- enabling experiences and explorations that are possible only through technology
- adding unique sensory elements to an experience
- supporting formation of memories about hands-on experiences
- extending an experience beyond the exhibit (and/or beyond the museum)
- providing a positive and accessible experience for people with a variety of abilities and learning styles.

Observed negative qualities include:

- disrupting or impeding a potential learning experience
- isolating people and detracting from social engagement
- causing frustration when it malfunctions
- causing frustration when it is developmentally inappropriate or inaccessible
- inadvertently dominating an experience
- leading to sedentary behaviors
- requiring significant resources (for maintenance, repairs, updates, etc.).
Our Position on Technology

Taking into consideration our deep commitment to developmentally-appropriate practice, our knowledge of current research, our understanding of why and how children and families play and learn at CCM, and our observations of technology usage in our space and others’, we set forth the following position statements in regards to the role of technology within our visitor experience:

- CCM’s primary visitor experience goal is to give children opportunities to interact with the physical world. We believe this is a key differentiator of the CCM experience in a world that is becoming increasingly reliant on digital experiences for both children and adults, and we will continue to prioritize this as the essential characteristic of our visitor experience.
  
  – Direct experiences with the physical world—experiences that actively engage the hands, whole body, and all the senses—enable essential growth in all developmental domains.

  – Technology should only be used when it is the best way to meet an experience goal (i.e. it allows the child to have a meaningful experience that only technology can offer), or when it adds a valuable layer to the learning experience.

  – Technology should never interfere with a child’s capacity to reflect on their experience. If used, technology should support reflection and enable deeper understanding of a physical experience.

- CCM focuses on helping children make face-to-face interpersonal connections and engage in social interactions to build relationships in our space. This has direct correlations to social emotional growth and language development. Technology, if used, should support, not interrupt, this goal.

- CCM’s educators understand the importance of growing and maintaining their own digital literacy. Staff must remain up-to-date with new research findings related to technology and children. This will ensure that they are able to think critically when selecting technology and media for young children as the museum moves forward.

- CCM will consider opportunities for incorporating appropriate technology into its space on a case-by-case basis and through a thoughtful, intentional and collaborative process. Decision-making shall be guided by the approved set of criteria defined below:

> “The language environment of the child from birth to three...affects the core of who [they] are. And it depends on more than words; it depends on how the words are spoken...and the warm, human receptiveness of the parent or caretaker. It will take a lot of digital inventiveness to replicate that.”

Dana Suskind, M.D., Thirty Million Words: Building a Child’s Brain
Criteria to use when considering any particular technology for use at CCM

Technology may be appropriate for use in our visitor experience when it:

1. Supports our play and learning values and goals, and is the best possible way to reach those goals.

2. Is not at odds with any of CCM’s other positions.

3. Provides access to an experience that our audience would likely not encounter elsewhere; and/or provides connections to prior experiences.

4. Creates connections between people rather than interrupting connections or isolating an individual. Creates an opportunity for joint attention and language-rich interactions.

5. Is active, hands-on and empowering: grounded in the fundamentals of what is developmentally appropriate for our 0-10 age group; is a real tool that enables creativity, exploration, learning and play.

6. Enriches, enhances, or supports an experience, but is not the whole of an experience. In other words, if the technology breaks down, there is still an experience available.

7. Helps visitors connect further and more deeply with the place-based experiences of CCM. Examples:
   - Technology that supports reflection, documentation, and conversation about the museum experience.
   - Technology that makes the museum an inclusive experience, such as providing a tool that supports the experience for people with varying abilities and learning styles.

8. Is able to be accessed quickly and easily, and has multiple entry points to make it as accessible as possible.

9. Is durable, long-living, functional, affordable, and practical. The appropriate infrastructure and resources are available to ensure the tech experience will ultimately be successful and sustainable.

10. Respects visitors’ safety, security, and privacy, and is in accordance with all laws governing technology usage. (COPPA, etc.)
Addenda: Technology

Addendum 1: Reviewers

- Jennifer Asimow, Associate Professor, Child Development, Harold Washington College
- Blakely Bundy, Co-Director, Defending the Early Years
- Mike Davis, Department Chair, Natural Science, St. Petersburg College
- Chip Donohue, Director, Erikson TEC Center
- Angela Fowler, Co-Founder and Executive Director, Cultivating the Early Years
- Mike Horn, Director, TIDAL Lab; Assoc. Professor of Learning Sciences and Computer Science, Northwestern University
- Jordan Sadler, Speech-Language Pathologist, Northwestern University
- Sherry Turkle, Founder and Director, MIT Initiative on Technology and Self; Abby Rockefeller Mauzé Professor on the Social Studies of Science and Technology, MIT
- Jane Werner, Executive Director, Pittsburgh Children’s Museum
- Beth Wilson, Director, Hobson School

Addendum 2: Resources

NAEYC, National Association for the Education of Young Children
naeyc.org

NAEYC/Fred Rogers Center Joint Position Statement (2012)
naeyc.org/content/technology-and-young-children

Fred Rogers Center: Digital Media and Learning Resources
fredrogerscenter.org/initiatives/digital-media-learning/resources/

AAP, American Academy of Pediatrics
aap.org/en-us/Pages/Default.aspx

Children and Media: Tips for Parents
Growing Up Digital Media Research Symposium

Campaign for a Commercial Free Childhood
commercialfreechildhood.org

Erikson Institute – Center for Technology in Early Childhood
teccenter.erikson.edu

Zero to Three
zerotothree.org

Thirty Million Words Initiative – The University of Chicago Medicine
thirtymillionwords.org