# Technology and Interactive Media in Early Childhood Programs

What We've Learned from Five Years of Research, Policy, and Practice

Chip Donohue and Roberta Schomburg

In one seemingly simple activity, Kimberly Buenger, early childhood special education teacher at Harmony Early Childhood Center, in the Olathe Unified School District, accomplishes goals related to technology use, language development, social skills, and assessment:

> I serve children ages 3 to 5 in an integrated special education setting, with many demonstrating developmental delays. I use technology to support learning and development in several ways. One of my favorites is through a classroom job called *the journalist*. The journalist is responsible for taking pictures on the tablet during center time to document the activities of the other students in the class, and reporting about one picture during closing circle. The picture is shown through the projector so all the children can easily see it. I facilitate the discussion about the picture, adjusting my level of questioning for each child. This activity provides a natural way to assess a variety of communication skills, such as a student's ability to recall events and answer a variety of *wh* questions. Giving the journalist the freedom to document the activity of his or her choosing makes the activity meaningful, increasing motivation to share in front of the larger group. The simplicity of the activity makes it easy to implement in a variety of settings, using different technology tools, with the only requirement being the ability to take a picture. (Personal communication with Kimberly Buenger, 2017.)
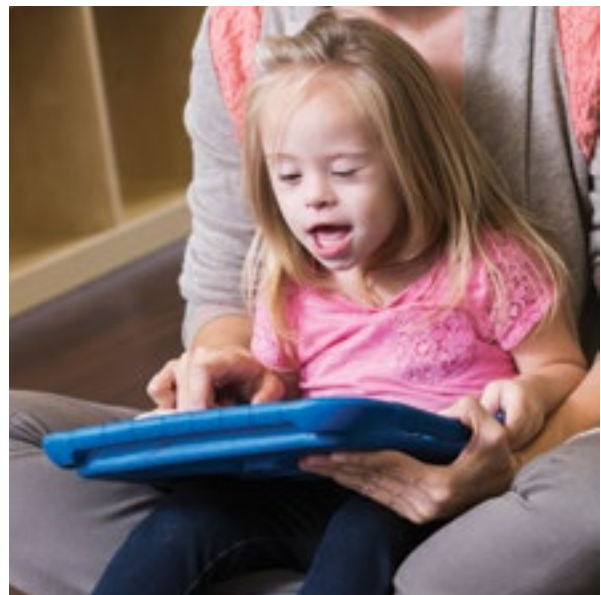
Kimberly's budding journalists are a model for intentional, supportive use of technology in early childhood education.

Kimberly's learning environment is far richer than anything we could have imagined just 10 years ago, when the Fred Rogers Center for Early Learning and Children's Media convened a group of experts (including us) at a preconference symposium during the 2007 NAEYC professional development institute. Participants discussed the role of technology in early childhood professional development and in the lives of young children, especially in early childhood programs.

Realizing that few educators were as technologically savvy as Kimberly (even given the more limited technology options of the time), conference participants recommended that NAEYC and the Fred Rogers Center draft a joint position statement to help early childhood professionals integrate technology in developmentally appropriate ways. As Jerlean Daniel, then-executive director of NAEYC, recalls, the field was embroiled in serious debates:

> Prior to the development of the current position statement on technology and young children, NAEYC had three statements—all in need of revision—on technology, television, and violence in the media. These were reflective of the grave concerns in the field about the exposure children had to violent themes delivered into their homes by television and the potentially inappropriate use of computers in early childhood education programs. As the quantity and diverse types of screens multiplied quickly, the field was quite divided about the developmental appropriateness of *any* technology for young children.
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> The question of equity loomed large as well. Many children whose home language was not English used television as a tool to learn English. For Black children from low-income families living in underresourced communities, television was often a heavily used source of entertainment. White children from middle-income families were more likely to have a variety of screens at home, while rural children typically had spotty access to the Internet.
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> Such charged controversy has always signaled the need for an NAEYC position statement. But we needed a highly respected partner, one with a proven track record for developmentally appropriate use of technology. No entity came close to the stellar reputation of the Fred Rogers Center for Early Learning and Children's Media, a unique combination of child development and media knowledge. The transparent back-and-forth of consensus building was not easy, but all parties knew their concerns had been given serious consideration. The various factions saw their issues acknowledged in the final position statement. (Personal communication with Jerlean Daniel, 2017.)

Building consensus was neither fast nor easy, but in 2012, NAEYC and the Fred Rogers Center issued a joint position statement titled "Technology and Interactive Media as Tools in Early Childhood Programs Serving Children from Birth through Age 8." (For the full position statement and a two-page summary with the key messages, visit www.naeyc.org/content/technology-and-young-children.)

Key messages

Grounded in developmentally appropriate practice (Copple & Bredekamp 2009), the statement provided a clear framework for effective, appropriate, and intentional use of technology and media with young children in the digital age of smartphones, multitouch screens, and apps. The following key messages were intended to guide educators in early childhood settings on the selection, use, integration, and evaluation of technology tools for learning:

> When used intentionally and appropriately, technology and interactive media are effective tools to support learning and development.

> Intentional use requires early childhood teachers and administrators to have information and resources regarding the nature of these tools and the implications of their use with children.

> Limitations on the use of technology and media are important.

> Special considerations must be given to the use of technology with infants and toddlers.

> Attention to digital citizenship and equitable access is essential.

> Ongoing research and professional development are needed.

Our long-term vision was to develop "digitally literate educators who . . . have the knowledge, skills, and experience to select and use technology tools and interactive media that suit the ages and developmental levels of the children in their care, and . . . know when and how to integrate technology into the program effectively" (NAEYC & Fred Rogers Center 2012, 4).

Now that the position statement is five years old, we are seeing more and more digitally literate educators. Take Sydney E. Spann, for example. A kindergarten teacher

and innovation coach at Rodriguez Elementary, in Austin, Texas, Spann carefully selects technology to help children build knowledge:

> Early last October, my kindergartners were working hard to learn all about fall, though it was still too early to see many of the indicators of the season change here in central Texas. One marker of the season that my students were able to observe was butterfly migration. Swarms of butterflies were migrating through Texas, and we were lucky enough to walk under a cloud of monarchs on our way inside from recess.
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> We immediately looked at pictures online of the area in Michoacán, Mexico, where many of these butterflies would end their journey. Then I showed my students the Butterflies of Austin iPad app. All the introduction they needed was a quick demonstration of how to change the pictures, and they were ready to explore and record! They spent days looking through the photos of butterflies, caterpillars, and pupae and recording the images in their science notebooks. My students' use of this simple app showed me that the way children interact with technology is not that different from the way they interact with any other learning tool. It's not flashy features and bright colors that engage them, but simply the fact that there is new knowledge that can be gained. (Personal communication with Sydney E. Spann, 2017.)

The NAEYC/Fred Rogers Center's joint statement has served as one of my important resources about technology and its effect on young children. As stated on the technology section of our website, at the Pike School "we believe that a successful technology program is measured not so much by which technologies you use or by your frequency of using them but rather by what you choose to do with technology and how you use it."

—Jennifer J. Zacharis, Technology Integrationist/Coach, Pike School, Andover, Maryland

Essential Guidelines and Reports 2014–2017

The following resources summarize recent research, which reinforces central tenets of the NAEYC and Fred Rogers Center position statement (available at www.NAEYC.org/content/technology-and-young-children).

- "Screen Sense: Setting the Record Straight—Research-Based Guidelines for Screen Use for Children under 3 Years Old." 2014. ZERO TO THREE. (www.zerotothree.org/resources/series/screen-sense-setting-the-record-straight)
- "Using Early Childhood Education to Bridge the Digital Divide." 2014. Santa Monica, CA: RAND Corporation. (www.rand.org/pubs/perspectives/PE119.html)
- "Using Technology Appropriately in the Preschool Classroom." 2015. *HighScope Extensions* 28 (1): 1–12. (http://membership.highscope.org/app/issues/162.pdf)
- "Early Learning and Educational Technology Policy Brief." 2016. US Department of Education and Department of Health and Human Services. (https://tech.ed.gov/files/2016/10/Early-Learning-Tech-Policy-Brief.pdf)
- "Media and Young Minds." 2016. Policy statement. American Academy of Pediatrics, Council on Communications and Media. (http://pediatrics.aappublications.org/content/pediatrics/early/2016/10/19/peds.2016-2591.full.pdf)
- "Technology and Interactive Media for Young Children: A Whole Child Approach Connecting the Vision of Fred Rogers with Research and Practice." 2017. Fred Rogers Center (www.fredrogerscenter.org/frctecreport) and the Technology in Early Childhood (TEC) Center at Erikson Institute (http://teccenter.erikson.edu/tec/tecfrcreport/).

Alignment with recent statements, guidelines, and reports

The NAEYC and Fred Rogers Center joint position statement was the first in a series of guidelines and research-based recommendations about technology and young children published by organizations focused on child development and early childhood education (Donohue 2016, 2017). For other useful resources, see "Essential Guidelines and Reports, 2014–2017."

Two of the three most recent policy statements were released by the American Academy of Pediatrics (AAP) and the US Departments of Education and Health and Human Services (ED/DHHS) on the same day in October 2016.

The AAP statement on "Media and Young Minds" includes recommendations for parents about technology and media use in the home with children from birth through age 8.

According to the AAP, parents need to be mindful about the risks of displacing or replacing essential developmental experiences in the early years due to overuse of technology. Limits on media use for children birth to 18 months, 18 to 24 months, and 2 to 5 years can provide adequate time for young children to play and be physically active, to spend time indoors and outdoors, to have social time with friends, to enjoy one-to-one time with siblings and parents, and for family time without screen disruptions. Parents are encouraged to create a family media plan that includes tech-free zones and times, including no media use during meals and one hour before bedtime. The AAP emphasis on joint engagement, relationships with family and friends, preserving essential early childhood experiences, and careful selection of appropriate, high-quality content are closely aligned with the principles and guidelines in the NAEYC and Fred Rogers Center joint position statement.

The ED/DHHS report "Early Learning and Educational Technology Policy Brief" includes four guiding principles:

> Technology, when used properly, can be a tool for learning

> Technology should be used to increase access to learning opportunities for all children

> Technology can be used to strengthen relationships among parents, families, early educators, and young children

> Technology is more effective for learning when adults and peers interact or coview with young children

In regard to screen time, ED/DHHS ask that families and early educators consider far more than time when evaluating technology. The report points to content quality, context, and the extent to which technology could be used to enhance relationships as key factors. These guiding principles from AAP and ED/DHHS build on and deepen the key messages from the NAEYC and Fred Rogers joint position statement, adding to our understanding of emerging research-based practices.

As the NAEYC and Fred Rogers Center joint position statement said, "When used wisely, technology and media can support learning and relationships. Enjoyable and engaging shared experiences that

In this era of uncertainty around the role of technology with all of us, especially young children, I am deeply appreciative of the position statement for offering a thorough examination of the strengths and possibilities of technology as well as the possible misuses. Through this research, we have seen educators willing to try new things and open doors to new worlds for themselves and children.

—Alex Cruickshank, Community Outreach Specialist, Boulder Journey School, Boulder, Colorado

optimize the potential for children's learning and development can support children's relationships both with adults and their peers" (2012, 1).

The new report by the Fred Rogers Center and the Technology in Early Childhood Center at Erikson Institute, "Technology and Interactive Media for Young Children: A Whole Child Approach Connecting the Vision of Fred Rogers with Research and Practice," aims to say the same. It synthesized recent research to identify what has been learned about technology and young children since the joint position statement was released in 2012, with a focus on the intersection of technology, interactive and screen-based media, and children's social and emotional development. It's clear that we still have much to learn about the impact of technology on whole child development. Fortunately, one of the key findings in the report is that the majority of children's use of technology or media includes imagining, playing, wondering, creating, and reflecting. This bolsters the notion that technology and media—when appropriately used—can improve children's readiness for school and enhance their social and emotional development.

In many ways, this finding simply codifies what digitally literate educators have already demonstrated. Used well—as one of many tools to enhance exploration and learning—technology brings wonder and excitement to everyday learning environments. As Claudia Haines, a youth services librarian at the Homer Public Library, in Homer, Alaska, explains, those savvy educators and those rich environments are not found only in schools:

> Several mornings a week, preschoolers and toddlers scamper through the front door of the Homer Public Library with grown-ups—moms, dads, grandparents, neighbors, or nannies—in tow. Year-round, the centerpiece of these weekly visits for many families is Storytime, a free program that uses high-tech and low-tech media to foster lifelong learning and early literacy skills. The public library connects families from all walks of life with information and resources, as well as each other. At Storytime, we read, talk, play, sing, explore, and create together.
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> For families who cannot afford preschool and for those supplementing it, the library's Storytime offers supported access to thoughtfully reviewed traditional and new media. And just as important, in the Storytime setting grown-ups also learn how to use media of all kinds in positive ways to support their young children's learning and development. Every book, song, app, art supply, and STEM activity we share is chosen with intention because it is high quality and supports research-based early literacy practices. (Personal communication with Claudia Haines, 2017.)

Consensus emerges

A synthesis of the position statements, reports, research reviews, guidelines, and recommendations released between 2012 and 2017 identifies strong agreement on a set of foundational elements necessary for successful technology integration with young children (Donohue 2015, 2016, 2017; Donohue & Schomburg 2015). For early childhood educators and the field, the takeaways about what matters most include:

> The fact that these two organizations are working together serves as an inspiration and reminder to others (teachers, parents, home visitors, therapists, children's media producers, etc.) to work together and support each other as we learn to navigate the digital age.
>
> —Stacey Landberg, Speech-Language Pathologist, American Speech–Language–Hearing Association

› **Relationships**—A child's use of media and technology should invite and enhance interactions and strengthen relationships with peers, siblings, and parents.

› **Coviewing and active parent engagement**—Using media together improves learning. Talking about what the child is seeing and doing, and connecting what is on the screen with real-life experiences, builds language skills and vocabulary, encourages interactions, and strengthens relationships.

› **Social and emotional learning**—Technology should be used in ways that support positive social interactions, mindfulness, creativity, and a sense of initiative.

› **Early childhood essentials**—Technology use should not displace or replace imaginative play, outdoor play and nature, creativity, curiosity and wonder, solitary and shared experiences, or using tools for inquiry, problem solving, and exploring the world.

› **Content, context, and quality**—The quality of what children watch on screens is more important than how much they watch.

› **Media creation**—Young children are moving from being media consumers to media creators. New digital tools provide the opportunity for making and creating at their fingertips.

> **Family engagement**—In the digital age, technology tools can improve communication between home and school, making it easier to exchange information and share resources. Engaging families improves outcomes for children.

> **Adult habits**—As the primary role models for technology and media use, adults should be aware of and set limits on their own technology and media use when children are present and focus on children having well-rounded experiences, including moderate, healthy media use.

> **Teacher preparation**—Preservice teacher education and in-service professional development are needed to provide educators with the media literacy and technology skills to select, use, integrate, and evaluate technology tools for young children.

> **Media mentors**—Young children need trusted adults who are active media mentors to guide them safely in the digital age.

Perhaps not surprisingly, these takeaways elaborate on a key point in the joint position statement: "Early childhood educators always should use their knowledge of child development and effective practices to carefully and intentionally select and use technology and media if and when it serves healthy development, learning, creativity, interactions with others, and relationships" (NAEYC & Fred Rogers Center 2012, 5).

Where to from here?

Although the consensus takeaways show that much progress has been made since the debates of a decade ago, there is still much to learn. We invite you to join us in building on our growing understanding of what matters most and of evidence-based practices. We believe that blending interactive technology and personal interactions with others offers the most promise for using technology as a tool for whole child development in the digital age.

Fred Rogers demonstrated how to use the technology of his day to support early learning with an emphasis on relationships, communication, and social and emotional development. He was a child development expert who always kept the child first and integrated technology in the service of positive self-esteem and healthy relationships. As Fred Rogers said, "No matter how helpful they are as tools (and, of course, they can be very helpful tools), computers don't begin to compare in significance to the teacher–child relationship, which

The Fred Rogers Center saw progress as we implemented the position statement across professional development workshops, reaching thousands of early childhood educators. Our perspective has not changed on the role of technology: we view it as an additional tool for young children, early childhood educators, and parents. The biggest challenge moving forward is providing practical guidance to families.

Early in his career, Fred Rogers listed six necessities for children to learn. As the Fred Rogers Center moves forward, we plan to apply those same necessities to technology use with young children. Following Fred's lead, we ask:

Does it ...

1. Create a sense of worth?

2. Create a sense of trust?

3. Spark curiosity?

4. Have the capacity to foster you to look and listen carefully?

5. Encourage the capacity to play?

6. Allow for moments of solitude?

As we develop initiatives around this concept, we look forward to continuing to champion the principles and guidelines from the position statement and working with our partners to implement a strategy that is based on positive and supportive messaging.

—Rick Fernandes, Executive Director, Fred Rogers Center

Resources

To read more stories and testimonials and view photos of the NAEYC/Fred Rogers Center joint position statement in practice, visit the Technology in Early Childhood (TEC) Center at Erikson Institute:
http://teccenter.erikson.edu/tec/positionstatement5/

To learn more about the joint position statement, key messages, and examples of effective practice and technology that support early learning, visit:

NAEYC on Technology and Young Children
www.NAEYC.org/content/technology-and-young-children

Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College
www.fredrogerscenter.org

Technology in Early Childhood (TEC) Center at Erikson Institute:
www.teccenter.erikson.edu/

is human and mutual. A computer can help you to learn to spell H-U-G, but it can never know the risk or the joy of actually giving or receiving one" (Rogers 1994, 89). Fred was a media mentor to countless children, parents, families, and caregivers—and his approach will continue to guide our work.

Five years ago, NAEYC and the Fred Rogers Center took a bold step in laying out a vision for the critical role technology can play in early learning programs. While the position statement was clearly about technology, it wasn't about which apps to use or how to unlock digital coding. It was directed at early childhood educators and what they, as classroom and program leaders, must know and be able to do in order to effectively use technology.

Five years later, that is still the most important aspect of our work with technology. Neuroscience and behavioral science point to unparalleled cognitive, physical, and social and emotional growth in young children. These sciences have also shown us that our lifelong approaches to learning—things like initiative, curiosity, motivation, engagement, problem solving, and self-regulation—are at their height of development in the early years.

Early childhood educators must redouble their efforts to identify and deploy the most effective uses of technology in order to maximize the learning and development of young children. Think about the acquisition of oral language, the developmental progression of mathematics, the growth of self-regulation and inhibitory control, the mechanics of working memory, and the facilitation of relationships with children and their families—early childhood educators must master a great deal of knowledge and skill in each of these areas. There are many ways effective uses of technology and digital media can support early childhood educators in preparing young children for success in school and in life.

—Rhian Evans Allvin,
Chief Executive Officer, NAEYC

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About the authors

Chip Donohue, PhD, is dean of distance learning and continuing education and director of the TEC Center at Erikson Institute and Senior Fellow and advisor of the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College, in Latrobe, Pennsylvania. Donohue and Roberta Schomburg cochaired the working group that revised the 2012 NAEYC & Fred Rogers Center Joint Position Statement on *Technology and Interactive Media as Tools in Early Childhood Programs Serving Children from Birth through Age 8*.

Roberta Schomburg, PhD, is Professor Emerita at Carlow University in Pittsburgh, Pennsylvania; Senior Fellow at the Fred Rogers Center for Early Learning and Children's Media, and a consultant to the Fred Rogers Company and Daniel Tiger's Neighborhood. She was an NAEYC Governing Board member from 2010–2014.