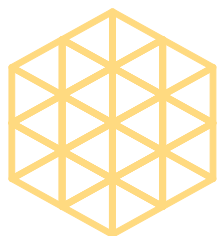




Young Learners and Technology

Can digital tools support a child's development?

The wise use of technology and media can help fuel young children's early learning and healthy growth. Yet even the best designed tools and programs can never replace human interaction or good teaching. Children need caring and knowledgeable adults to help them navigate the world, including guiding them in constructively exploring the ever-changing landscape of new tools and games.



A bright and beeping array of technology surrounds children: smart phones and computers at home; tablets in classrooms; TV monitors in doctor and dentist offices, malls, even at the gas station. Much like snack food, some of the content in this technology provides children with little nourishment.

Yet EDC has found that digital resources, such as interactive mobile apps, online games with built-in assessments, and videos that tell compelling stories with a rich set of characters, can play productive roles in early teaching, learning, and health promotion. Content-rich

technology and media has an especially key role in helping close opportunity gaps for children from under-resourced communities.

For example, with support from the Bill & Melinda Gates Foundation, EDC is identifying and testing high-quality digital resources that have the potential to support early childhood teachers serving young dual language learners in the United States. In Rwanda, all Grade 1 to 4 classrooms used EDC's **Interactive Audio Instruction** lessons in Kinyarwanda and English, with resulting dramatic gains in mother tongue and English literacy.



How can digital tools help adults help children?

Digital tools can give families and teachers fast access to research-based strategies that guide them in enhancing young children's learning, health, and safety.

For decades, EDC has led R&D focused on the use of technology to improve learning, health, and economic opportunity. From our preschool to Grade 3 work, we have come to recognize one central tenet: adults need and benefit from ongoing support as they nurture and inspire young children. Digital tools can help meet this need by providing effective, low-cost, "just-in-time" learning for adults.

From our research and work with teachers and families, we have found that digital tools support adults when they:

- Present clear, accurate, and culturally and linguistically relevant content.
- Provide models of real engagement for educators, parents, and children.
- Connect educators and families to a community of fellow learners.
- Provide ready access to resources and adaptable activities for children.
- Offer tailored learning that reflects adults' prior knowledge and experience.
- Blend new uses of technology with tried and true hands-on learning.

The **Health Moments** app that EDC developed for the Office of Head Start helps home visitors support families in high-need communities in preventing illness and promoting good health. Grounded in research from the Centers for Disease Control and Prevention, the app and related materials guide home visitors in raising important health-related topics and sharing best practices in a respectful way.

Digital tools also can show adults how to engage children in rich conversations. Research shows that children gain literacy and STEM skills, and build the background knowledge they need for school success, by talking to adults deeply and often each day.

Adults need guidance in how to use productive talk—asking questions, restating ideas, sharing theories and observations, replying to questions—to scaffold young children's learning. In **Bringing Science Home with PEEP**, EDC is advancing knowledge of strategies to support families, and especially families in high-need communities, in weaving early science learning and productive talk into home life. With media specialists and home visiting organizations, we are developing and testing a Family Engagement Toolkit that features digital and hands-on science learning resources—and materials to help home visitors use the toolkit with families—to build families' capacity to foster their children's early science learning and school readiness.

In partnership with WGBH, EDC is providing new insights into how technology can help teachers support young children's acquisition of computational literacy, an important precursor to computer science. Working directly with families, as well as educators who teach in under-served urban and rural preschools, we are helping identify the building blocks of computational thinking. **Monkeying Around** encourages children and caregivers to experiment with hands-on activities and digital tablet apps, and will soon have a complementary broadcast series on PBS. Productive talk in circle time and story time is part of the intervention.



If relationships with caring adults are what children need most, why bother with digital tools?

When thoughtfully used, digital tools can help create a dynamic learning environment that has direct benefits for young children.

Digital tools can provide access to information that is otherwise invisible: how seeds sprout roots and grow into plants; how shadows shift as the sun passes above; or how a bird constructs a nest. They can bring key science and math concepts to life for children, helping to close opportunity and achievement gaps.

For over 10 years, EDC has advanced knowledge of the role that “transmedia” resources—video, online games, tablet-based apps, and print activities—can play in enhancing school readiness and success. Findings from our study of the Emmy award-winning series PEG + CAT highlight the importance of making quality transmedia resources available to children and adults, especially those in low-income households.

We found that children who used content from PEG + CAT showed stronger improvement in critical math areas involving ordinal numbers, spatial relationships, and 3-D shapes. Their families showed greater comfort and confidence in supporting children with math concepts and problem-solving strategies, more parent-child technology use, and more conversation connecting media and daily

life. From other research—such as our National Science Foundation-funded **Next Generation Preschool Math** and **Next Generation Preschool Science** studies and **Finding Our Way Around**, which is funded by Heising-Simons Foundation—we have found digital tools support children’s learning when they:

- Expose children and adults to phenomena they might not be able to access, and offer opportunities to record and review data.
- Give children opportunities to build, and practice applying, skills and knowledge.
- Engage children in tasks that invite sharing, collaborating, and discussing, such as paired playing of digital games.
- Promote social interactions and joint engagement between children and with adults.





Can media producers be on the frontlines of children's learning?

Yes, some already are, and their strength often is in their capacity to join a larger network of care. If we are to address persistent learning challenges in the U.S. and across the globe, we need to reframe the conversation about “screen time” to focus on providing all children with equal opportunities to engage with high-quality educational resources.

Media producers are crucial allies in ensuring all children reach their full potential. Their abundant creativity and technical prowess ideally positions them to expand access to high-quality educational resources. As a research partner to many media producers, EDC has had the benefit of collaborating with PBS and companies making free, interactive resources for children around the world. We have witnessed firsthand the vital role that media producers can play in helping families and teachers improve child outcomes. We also have gained insights into how important it is for educators, learning scientists, and media producers to work together to achieve the highest quality content.

For example, through the U.S. Department of Education's **Ready to Learn** initiative, EDC is helping the U.S. public media system create better services for millions of families, especially those living in communities with high concentrations of poverty. We are



studying Sesame Workshop's **Dream, Save, Do**, a seven-country multimedia financial literacy program that is expanding economic opportunity and financial empowerment for families with children ages 3 to 6. In Zambia, EDC recently led the development of **Vernacular**, a USAID-funded literacy intervention that makes use of an interactive, tablet-based program. Zambian students who used Vernacular in a four-month pilot consistently outperformed students who used a workbook literacy intervention.

EDC also has collaborated with thousands of schools, community organizations, health providers, home visiting programs, museums, libraries, and others who serve children. We have seen many exciting advances, but there is much farther to go before all children's and families' needs are met. Joining together with multi-sector partners, we continue to pioneer new ways to harness the power of digital tools to ensure all children and families thrive.