



Moving Beyond Screen Time

Redefining Developmentally Appropriate Technology Use in Early Childhood Education

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Conversations about what constitutes “developmentally appropriate” use of technology in early childhood education (ECE) have, to date, focused largely on a single, blunt measure—screen time—that fails to capture important nuances, such as what type of media a child is accessing and whether technology use is taking place solo or with peers. Using screen time as the primary measure of developmentally appropriate use has become increasingly inappropriate, as new technologies are ever more rapidly introduced and integrated into all aspects of life. In this policy brief, we challenge the traditional emphasis on screen time and discuss how to move toward a more comprehensive definition of developmentally appropriate technology use for young children.

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Why Focus on Technology and Early Childhood Education?

Digital literacy—the knowledge and skills needed to use technology “to analyze, learn, and explore”ⁱ—plays an important role in a child’s ability to succeed in school and beyond. Yet, despite rapid growth in society’s use of information and communication technology, many children in low-income families in the United States are unable to access technology—including devices, software, and connectivity—in the same ways as their more-advantaged peers. And even when children from low-income families are able to access technology, they often learn to use it in different ways. The result? Fewer opportunities to learn, explore, and communicate digitally, and fewer chances to develop technology skills that might be needed for success in school and the workplace.

Technology use in formal early childhood education (ECE) settings, such as preschools and child-care centers, may help shrink the digital divide in terms of both access and use for children in low-income families. Both in and beyond formal ECE settings, technology use may also play a valuable role in ensuring that all children enter kindergarten with early digital literacy skills—and in helping them build skills in such areas as literacy, math, and motor development by providing additional opportunities for exploration, interaction, communication, and creativity. With adequate resources and support, ECE providers and family members may also benefit from technology use in ECE as they lead and encourage the education of young children.

Among children ages 3–5, technology use is not without potential pitfalls. Some physicians, policymakers, educators, and parents are concerned that technology use in ECE may have a negative effect on the development of social and gross motor skills, contribute to obesity, and diminish skill development in areas beyond digital literacy. So, as we seek to realize the potential benefits of technology use in ECE, we must also ensure that we address potential harms.

Charting the road ahead requires careful thought and planning. A broad group of stakeholders must be invited to the discussion, and their unique perspectives—and, occasionally, competing priorities—must be understood and addressed. We propose that achieving a better understanding of how to integrate technology into ECE requires answering five key questions:

1. What are the goals for technology use in ECE?
2. How do we define developmentally appropriate technology use in ECE?
3. Once defined, how do we support developmentally appropriate technology use through devices, software, connectivity, and other components of technology infrastructure?
4. How do we ensure that ECE providers are prepared to integrate technology appropriately, intentionally, and productively into ECE settings?
5. How can parents and other family members play a role in the use of technology in ECE?

Our Approach

The study of modern technology use in ECE is, by definition, a relatively nascent field, and research has largely examined only isolated aspects of the topic (with a heavy emphasis on the effects of watching television). Therefore, considerable debate, disagreement, and uncertainty remain, although consensus appears to be forming around the need to integrate technology into ECE in an intentional and productive way. In February 2014, the RAND Corporation published a framing paper, *Using Early Childhood Education to Bridge the Digital Divide*, that summarized and assessed the existing literature and outlined the five key questions introduced above.ⁱⁱ The paper also described the need to involve a wide range of stakeholders in discussions, planning, and implementation.

In May 2014, RAND and PNC Grow Up Great hosted a one-day forum that brought these stakeholders—advocates, educators, researchers, policymakers, funders, and parents—together to discuss issues, needs, evidence, and ideas related to technology use in ECE. Through plenary sessions and smaller breakout groups, the 45 forum participants shared their perspectives on each of the five key questions.

This policy brief integrates findings from our literature review with the perspectives of forum participants. Therefore, its contents cannot be considered comprehensive or definitive. Rather, we offer suggestions in the spirit of advancing knowledge and encouraging continued conversation as stakeholders move ahead with policies and programs that support technology use in ECE.

ⁱ International Society for Technology in Education, “Digital Age Learning,” web page, copyright 2014. As of August 28, 2014: <http://www.iste.org/standards/standards-for-students>

ⁱⁱ L. Daugherty, R. Dossani, E. Johnson, and M. Oguz, *Using Early Childhood Education to Bridge the Digital Divide*, Santa Monica, Calif.: RAND Corporation, PE-119-PNC, 2014. As of June 6, 2014: www.rand.org/t/PE119

The Ascendance of Screen Time

For many years, “appropriate” technology use by young children has been defined largely by the amount of time a child spends using technology, a measure called *screen time*. In 1999, the American Academy of Pediatrics (AAP) recommended that screen time be limited to two hours a day for children over age two, and that no screen time be allowed for children younger than that.¹ Screen time guidelines were established when television was the only form of technology that most young children consumed, and the guidelines were intended to limit the passive, sedentary patterns of use that typically accompany television viewing. The AAP and the White House Task Force on Childhood Obesity continue to promote these guidelines, and studies have provided some evidence that raises concerns about the potentially negative effects of technology use on young children’s behavior, attention, focus, academic performance, weight, social development, and language development.²

These physician- and government-approved guidelines have encouraged many schools and families to use screen time as the primary means of guiding and monitoring technology use among young children. For example, time limits on technology use have been built into rating systems for ECE providers, with educators typically instructed to allow each child no more than 20–30 minutes of screen time each day.³ Parents, too, appear to be using these guidelines when making decisions about their children’s technology use: According to a March 2014 poll, 53 percent of parents reported adhering to AAP recommendations for screen time, and 88 percent said that two hours or less of screen time is “reasonable” for children ages 2–5.⁴

Despite this strong emphasis on screen time as the measure of developmentally appropriate use, attempts to limit the amount of technology use among young children have been unsuccessful. On average, screen time is on the rise, and preschool-age children spend far more than two hours using technology each day. For example, studies from 2009 indicate that children ages 2–5 watch more than 3.5 hours of television each day, with nearly 2.5 hours of television

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exposure occurring in child-care settings.⁵ And those figures account only for television exposure—not computer, tablet, and smartphone use. In recent years, the number of technologies available to young children has increased rapidly, offering new possibilities for technology use that is interactive and mobile and that can help support learning in new and engaging ways.⁶

Forum participants agreed that the narrow focus on screen time should give way to a more comprehensive definition of developmentally appropriate technology use by young children. The definition should consider *what* technology and content are used, *how* they are used, and *why* they are used—all in addition to *how often* they are used.

Moving Toward a Comprehensive Definition of Developmentally Appropriate Use

Some ECE experts contend that the task of defining developmentally appropriate technology use is no different from the task of defining developmentally appropriate use for any other learning tool, such as a book or a set of blocks. They counsel ECE providers to ask, as they would for any tool, “Is the content and form of the tool developmentally appropriate for young children? How will using the tool help support children’s learning?”

The literature and forum participants suggest six factors that should be considered in defining developmentally appropriate technology use:

1. **Whether use is purposefully integrated to support learning.** Developmentally appropriate teaching practice suggests that, like any tool, technology should be used thoughtfully and intentionally to support learning and build specific skill sets. Research shows that, used appropriately and purposefully, technology can improve reading, mathematics, science, and motor skills.⁷ Technology-based activities must be built into a larger curriculum, and it is important to evaluate both when these activities are likely to be most appropriate and when traditional activities are likely to be more effective. Given the wide range of nontechnology tools and activities that are important in ECE, time spent on technology should be balanced with other activities.⁸ The degree to which online and offline activities are integrated is also important. In some cases, evidence suggests that it can be difficult for young children to move from technology-based activities to activities that do not involve technology.⁹
2. **Whether use is solitary or taking place with others.** Children learn and build social skills partly through interaction with peers and adult facilitators.

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Collaborative, interactive use of technology appears to have positive effects on social skills, whereas excessive solitary use may be harmful.¹⁰

3. **Whether use is sedentary or mobile.** Active play is an important part of ECE, and technology use should support this goal. Sedentary technology use is associated with increased rates of obesity, but incorporating technology into active play (e.g., exploring outdoor environments while using a tablet to identify wildlife, exercise-based games on such devices as the Wii gaming system) can reduce the likelihood of negative health effects associated with technology use among young children.¹¹
4. **The content and features of media.** Not all software, applications, and other media content are created equal. Content with violent or adult themes should, of course, never be used by young children. Software and other media must be designed to be developmentally appropriate for the age of the child who uses it, and it should be engaging, interactive, and educational.¹²
5. **Device features.** In general, certain devices may be more appropriate for young children than others. For example, young children need devices that are sturdy and easily manipulated. The appropriateness of a device may also depend on how it is being used. For example, devices used in active play may need to be easily transportable, whereas desktops may be suitable for more-sedentary activities, such as reading or writing. The features of different devices may also help build different skills. For example, tablets may help children develop certain fine motor skills and with reading and emerging literacy, whereas devices with keyboards may be better for developing writing skills.¹³

6. **Total screen time.** Excessive sedentary and passive screen time is associated with negative consequences for a young child’s development, so setting limits on some types of screen time still makes sense. However, the two-hour guideline established in 1999 may need to be revisited to specify the type of technology use that should be limited.¹⁴ As noted earlier, technology use must be also balanced with other activities, so guidelines on the allocation of time may be useful.

As this section demonstrates, technology use is not monolithic, and the definition of developmentally appropriate use should reflect and accommodate the wide variation in possibilities that technology offers. Limits on screen time may remain important in restricting use that is passive, sedentary, or noneducational, and they may also prove useful in ensuring that children engage in a balanced combination of activities. However, a more-comprehensive definition of developmentally appropriate technology use will empower ECE providers and families to make better decisions about the ways in which young children use technology—and help maximize the benefits young children receive from this use.

Supporting Providers and Families in Their Quest for Developmentally Appropriate Use

Expanding the factors included in a definition of developmentally appropriate technology use makes the jobs of ECE providers and families more difficult: They must conduct more-complex assessments and engage in more-demanding decisionmaking than would be required to simply enforce limits on total screen time. To ensure that providers and families are supported, messages about developmentally appropriate use must be communicated consistently and accessibly through standards, funding, and informational efforts. Forum participants discussed a

wide range of potential approaches to spreading the word about developmentally appropriate technology use. We describe several here.

Changes in Policy and Funding. Changing policy mandates and funding at the local, state, and national levels, though typically a slow process, will be critical to redefining developmentally appropriate technology use in classrooms. Standards, assessment, and funding play an important role in communicating information to ECE providers and shaping behavior in ECE settings. In the area of standards, the Common Core is helping to drive increased integration of technology into the classroom. In addition to specific standards for digital literacy, the Common Core builds technology-based requirements into standards for core subjects and requires increased use of technology for assessment purposes. As we note in another policy brief, the rapid integration of technology into K–12 settings suggests that digital literacy is likely to become an important component of school readiness.¹⁵

For ECE providers, however, standards provide mixed guidance on technology use. A position statement released by the National Association for the Education of Young Children and the Fred Rogers Center for Early Learning and Children’s Media at Saint Vincent College provides a relatively comprehensive definition of developmentally appropriate technology use. However, according both to forum participants and a 2013 survey of ECE providers, relatively few providers are aware of this resource.¹⁶ Quality Rating and Improvement Systems (QRIS)—which help states assess, improve, and communicate about quality in ECE settings—typically describe few benefits to technology use and suggest that “appropriate use” is determined primarily by limits on time and content. States often use observational assessments, such as the Revised Early Childhood Environment Rating Scale (ECERS-R) and the Classroom Assessment Scoring System (CLASS) to assess the quality of ECE providers under the QRIS. However, these assessment tools place little emphasis on technology use, and technology-related standards differ dramatically from those associated with other nontechnology activities.¹⁷ For example, the CLASS rubric, which has been broadly adopted across Head Start providers, does not provide specific guidance on the use of technology in the classroom.¹⁸ ECERS-R standards for

block play, music, and art highlight benefits and encourage expanding opportunities, setting aside sufficient time, and ensuring openness to student creativity, but its standards for technology emphasize harmful effects, suggest limitations to use, and recommend that children not be required to participate. State and national standards concerning technology could be modified to provide both a more balanced view of technology's potential benefits and more information on how technology use can be effectively integrated into ECE settings to support learning.¹⁹

A number of other policy efforts could help support developmentally appropriate technology among young children. Funding can play an important role in supporting access to and use of technology. For example, the E-Rate program, a federal effort to provide technology infrastructure to K–12 and some ECE settings, supports sufficient *access* to technology among ECE providers.²⁰ Funding initiatives to support effective *use* of technology could include state and national support for research on effective technology practices with young children,²¹ and better funding for the training of ECE providers could help communicate standards and best practices that will support informed decisionmaking in the classroom.

Simple, Clear Guidance. Simple, clear guidance in the form of a short fact sheet that summarizes the six factors described earlier could immediately begin to influence ECE providers' and families' understanding of appropriate technology use. Related checklists or easy-to-use decision trees could further help providers and families make informed decisions about which devices and software to use and how to use the technology in developmentally appropriate ways. Larger public-service campaigns could also help ensure that ECE providers and families have the information they need to support developmentally appropriate technology use with young children.

Demonstrations of Appropriate Use. Early childhood educators attending the forum expressed frustration about the lack of models or exemplars of effective, appropriate integration of technology into ECE. Teachers, child-care providers, and families could benefit from seeing both appropriate and inappropriate practices in action. These demonstrations can be delivered live, via DVD, or over the Internet.²² In addition, traditional professional

development activities could be modified and expanded to include training on technology use.

Ratings of the Appropriateness of Software. Early childhood educators attending the forum reported having little or no time to evaluate software, websites, and other media prior to using them in the classroom. Families may face similar time constraints when monitoring and guiding children's technology use in the home. Providers and families alike may also lack the skills necessary to determine whether specific technology content is developmentally appropriate. Software ratings that identify the appropriate ages for use and provide an assessment of educational content can help busy or uncertain providers and families. Providers and families must be made aware of existing rating systems, such as those provided by Common Sense Media and the Entertainment Software Rating Board, and these systems must be continuously updated.²³

The Bottom Line

When screen time is emphasized as the primary means of identifying appropriate technology use among young children, and when it is applied equally to all screen use, it conveys the message that all technology is equal, that its benefits are limited, and that it should be used sparingly. However, rapid evolutions in both technology and our understanding of its potential benefits and harms suggest that a new, more expansive definition of appropriate use is necessary to guide and support the effective integration of technology into ECE settings. Technology use in ECE settings will be most effective when it is carefully integrated into a curriculum, when it is interactive and mobile, and when it involves developmentally appropriate devices and content. These aspects of technology use must be considered alongside screen time as important components of what constitutes developmentally appropriate use. A more comprehensive and nuanced definition of developmentally appropriate technology use will help providers and families understand how technology can be used to support learning and skill development, and it will provide them with the guidance they need to make better decisions for children in their care.



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