POLICY BRIEF

Getting Early Childhood Educators Up and Running

Creating Strong Technology Curators, Facilitators, Guides, and Users

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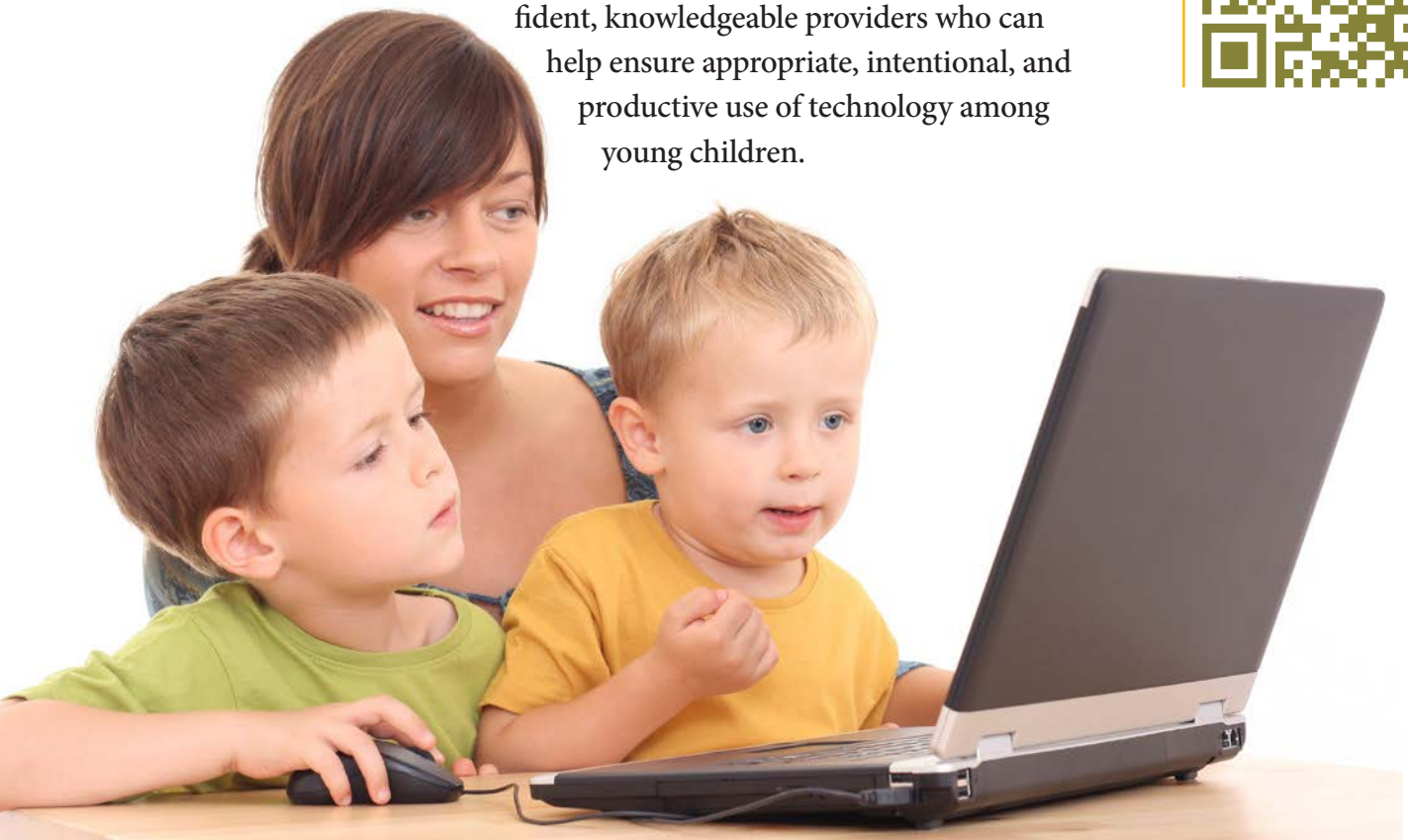
Providers of early childhood education (ECE) are well positioned to help ensure that technology is used effectively in ECE settings. Indeed, the successful integration of technology into ECE depends on providers who have the ability to *curate* the most appropriate devices and content, *facilitate* effective patterns of use, *guide* families and caretakers on developmentally appropriate practice, and *use* technology to support provider needs. But ECE providers face significant obstacles that might limit their ability to successfully incorporate technology into the learning process. In this policy brief, we describe both the barriers providers face and the efforts that might be helpful in creating confident, knowledgeable providers who can help ensure appropriate, intentional, and productive use of technology among young children.



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.

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[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

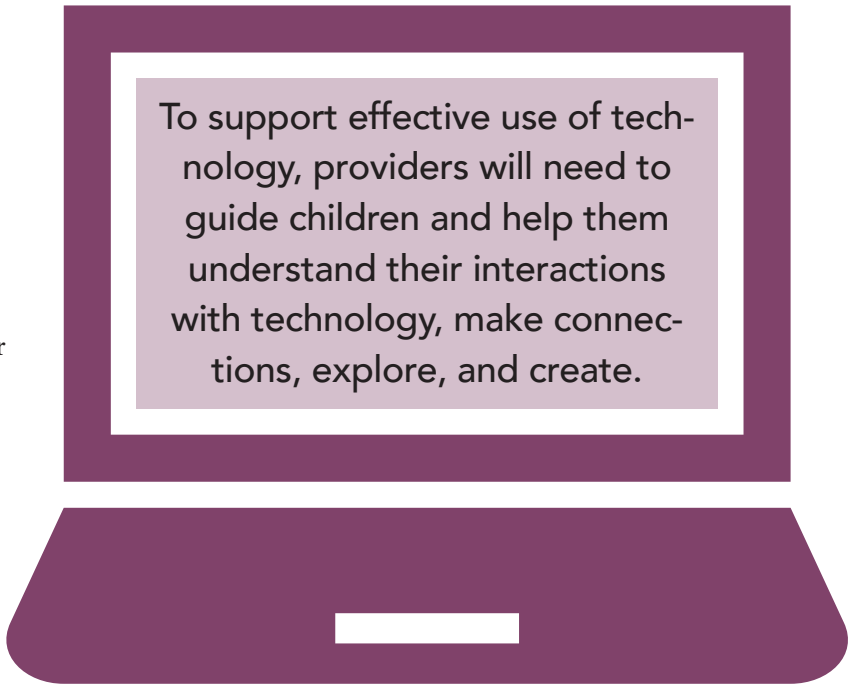
[ii] L. Daugherty, R. Dossani, E. Johnson, and M. Oguz, *Using Early Childhood Education to Bridge the Digital Divide,* Santa Monica, Calif.: RAND Corporation, PE-119-PNC, 2014. As of June 6, 2014: www.rand.org/t/PE119

The Four Key Technology Roles of ECE Providers

ECE providers can play an important role in providing access to technology, and they are well positioned to help ensure that technology is used effectively and appropriately in ECE settings. Providers are responsible for identifying the activities and tools that support learning among young children under their care. Technology is now another tool in the toolbox for ECE providers, and they are responsible for determining when technology-based activities can be integrated purposefully and appropriately to support learning. This means that providers must be aware of the available devices and software, able to select the appropriate tools, and knowledgeable about how and when to integrate technology-based activities into the classroom and other ECE settings. In this sense, ECE providers are **curators** of technology use in ECE settings.

Research suggests that technology use among young children should be interactive (i.e., encouraging of engagement with peers and adults) and purposeful (i.e., integrated thoughtfully to support learning).[1] To support effective use of technology, providers will need to guide children and help them understand their interactions with technology, make connections, explore, and create. In this sense, ECE providers are **facilitators** of technology use. Studies indicate that whether a child benefits from technology use depends largely on the presence of a strong facilitator.[2] Facilitation includes both interacting with the child through technology and overseeing a child's technology use. To ensure that they are successfully serving as curators and facilitators, providers should be able to reflect on their use of technology, evaluate the effectiveness of these efforts, and continuously improve practices.

ECE providers can also be **models** of appropriate technology use among young children, both for families and the children themselves. Many families may need guidance in selecting and using appropriate devices and software, setting guidelines for their child's technology use, and identifying effective ways for families to support effective technology use in the home. As providers gather information on the tools and practices likely to be effective in ECE settings, and as they determine how to effectively facilitate technology use among young children, they can transfer this knowledge to families to support effective technology use in the home. The ECE provider's role as a model for families may be particularly important in the case of low-income households, as children in these households may be less likely to have access to devices and software and to use technology in ways that are developmentally appropriate.[3]



Participants at the RAND–PNC Grow Up Great forum noted that ECE providers themselves are also **users** of technology for the purposes of administration, preparation, and communication in support of ECE. Indeed, one survey indicates that ECE providers "frequently" or "sometimes" go online to search for something related to work (79 percent and 16 percent), to look for activities to use in class (67 percent and 27 percent), and to use email to stay in touch with parents or their team (47 percent and 33 percent).[4]

It is important to note that provider settings, backgrounds, and skill sets vary widely. Although the roles providers play in supporting technology use in ECE may

be similar, the barriers they experience may differ, and the activities or changes needed to overcome these barriers may vary. In addition, teachers are not the only adults who curate, facilitate, model, and use technology in ECE settings. Librarians, center directors, and other adults can also play an important role in determining and guiding appropriate technology use. Although we agree that it is important both to understand variation across provider types and to tailor policies in accordance with provider needs, we intend the contents of this policy brief to apply broadly to all adults who are responsible for providing ECE.

Barriers to Getting Providers Up and Running

Although the use of technology in ECE settings is growing, many providers face significant barriers to fulfilling their four key technology roles. Here, we describe some of the barriers that providers face related to intentional and productive technology use.

Access challenges. As another policy brief in this series relates, ECE providers must have access to an adequate technology infrastructure—an infrastructure that allows them to perform all of the tasks and functions that flow from the goals for technology use in ECE.[5] Currently, however, many providers lack appropriate devices, high-quality software, and adequate Internet connectivity. Without these critical components, ECE providers face significant obstacles to fulfilling their four key technology roles.

Uncertainty about standards. ECE providers receive messages about technology use from a range of different sources, and many are unclear about the associated goals and standards. The January 2012 position statement issued by The National Association for the Education of Young Children (NAEYC) and the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College was developed to provide guidance to ECE providers on the proper use of technology with young children.[6] However, a 2013 study indicates that only 25 percent of ECE providers responding to a survey reported familiarity with the position statement.[7] Fewer than half of the survey respondents reported that their school or center has a technology use policy, and, among the policies that do exist, the types of standards they include appear to vary widely. Another policy brief in this series notes confusion over "developmentally appropriate use" and its relationship to screen time.[8] ECE providers who are uncertain about standards for technology use may be concerned that introducing new or more technology into ECE settings could cause more harm than good.

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Provider attitudes. Provider attitudes about technology use among young children vary widely—and, according to a recent study, personal attitudes are predictive of use of different types of technology in ECE settings.[9] While there are relatively few studies on ECE provider use of technology, and no nationally representative studies, a 2013 survey found that 11 percent of classroom teachers and 9 percent of family child care providers said children should be older than age four before being introduced to screen media technologies in child care or school settings.[10] About one-third of these providers reported that they "never" use computers in the classroom. In addition, provider attitudes vary with age, educational background, and provider type. For example, younger ECE providers express more-positive attitudes about the potential benefits of technology use among young children, and family providers are more likely to believe that technology should be introduced to children before the age of three.[11] To the degree that ECE providers have autonomy in choosing the activities that take place in their classrooms or facilities, negative attitudes or strong concerns about technology use may prove a strong barrier to effective technology use in some ECE settings.

Insufficient time. Introducing new tools to support learning in ECE settings can be challenging, In the case of technology, providers must think carefully about which devices and software are best suited for the children in their care, how to structure activities involving technology, and how to integrate these activities into the larger context of what takes place in their classroom or facility. Forum participants expressed concern about providers finding the time to carefully evaluate devices and software for suitability and integrate them into daily activities. Few ECE providers are given formal planning time to design lessons, align curriculum, or interact with colleagues around curriculum or other issues. Determining how to integrate new technology tools successfully represents yet another demand. Even when providers are eager to integrate technology into ECE settings, they may not do so because they simply cannot find the time they would need to become comfortable with the technology and plan how to integrate it successfully.

Inadequate training. Forum participants indicated that ECE providers might not be receiving the training they need to successfully and appropriately integrate technology into ECE settings. For example, a survey of prekindergarten teachers in one school district revealed that 60 percent reported receiving no preservice training on technology use.[12] Even in K–12 settings where educational technology is much more embedded, more than one-quarter of K–12 schools reported that teachers are not sufficiently trained to successfully integrate technology into the classroom.[13] Schools with high-poverty student populations are more likely to report inadequate training.[14] Forum participants expressed frustration over the lack of models or exemplars of effective, appropriate integration of technology into ECE, which might support providers' learning.

The technology development cycle. New technologies are being introduced and rendered obsolete at a rapid pace. Therefore, identifying potentially appropriate software and devices and then integrating them into daily activities can be a daunting undertaking. Providers accustomed to continuity in curricula and to a fixed number of familiar activities may find it particularly difficult to adjust to the technology development cycle and adopt tools with which they are mostly unfamiliar. In addition to the rapid development cycle, several forum participants noted that software designers often do not have a clear understanding of the needs of ECE providers, and that developers have limited knowledge of the ways in which young children learn.[15] When developers create technology that is not aligned with the needs of the end users, ECE providers may find that the new tools in their toolbox are of limited value.

Strategies for Breaking the Barriers

As other policy briefs in this series make clear, realizing the potential benefits of technology use in ECE will require the participation of a wide range of stakeholders, including ECE providers. Helping these providers become strong technology curators, facilitators, guides, and users requires breaking down barriers that prevent providers from effectively integrating technology into ECE. Here we describe four strategies for removing obstacles and otherwise helping ECE providers fulfill their key technology roles.

Provide guidance and training on effective, appropriate use. The NAEYC and the Fred Rogers Center have stated that facilitator preparation is a priority. They have also cautioned that "educators who lack technology skills and digital literacy are at risk of making inappropriate choices and using technology with young children in ways that can negatively impact learning and development."[16] It is critical that ECE providers receive clear, consistent messages about standards for technology use in ECE settings. Although the NAEYC and Fred Rogers Center position statement is a potentially valuable set of guidelines for technology use with young children, as we noted above, there have been challenges communicating the messages to many ECE providers, with many providers not having any awareness of the position statement. To ensure that developmentally appropriate practices are broadly adopted, expert findings on appropriate use (e.g., the findings described by the position statements released by

the American Academy of Pediatrics and by the NAEYC and the Fred Rogers Center) should be incorporated into formal state and local education standards and into quality rating and improvement systems (QRIS) for ECE providers. Accessible tools, such as the "Exemplary Uses of Technology Checklist," may be particularly useful in providing information to providers on standards for developmentally appropriate use.[17]

Effectively using technology in ECE settings will also require ongoing training. All preservice training for ECE providers must incorporate preparation on the use of technology with young children. In addition, ongoing professional development —which many QRIS standards require—is an important means of supporting ECE providers and could include instruction on selecting effective tools and activities, models of effective practices, and opportunities for providers to informally explore technology and receive guidance and feedback on their practices. Because ECE providers and the young children in their care will have different levels of digital literacy, professional development must be responsive to various needs. For example, older providers and providers who serve children from low-income families may require additional training, as they may face greater barriers to use, or may have to overcome more significant deficits in digital literacy.

Give providers time to explore, experiment, and plan. To be successful curators, facilitators, guides, and users, ECE providers must be comfortable with technology infrastructure, and with devices and software in particular. Exploring different technologies and simulating how children might use them is important to a provider's understanding of how technologies might be used to support learning objectives. Time for exploration might also increase provider confidence and help improve attitudes about technology. As noted earlier, professional development might afford opportunities for informal, unstructured exploration and experimentation with technology. However, it is also important to consider ensuring that provider work schedules include regular structured time for evaluating technology and planning how to integrate it into daily activities. Planning time in ECE settings is scarce, so additional funding to compensate providers might be required, as might changes to daily schedules (e.g., the introduction of technology planning periods during naptime).

Create learning communities. Technology evolves rapidly, and the potential benefits of technology use in ECE are still largely unexplored, so ECE providers face substantial knowledge barriers. Like professional development, learning communities (support structures that operate outside of formal training) can help providers become more knowledgeable about effectively using technology in ECE settings. In learning communities, participants can share best practices and lessons learned, quickly distribute knowledge, and create support groups for providers facing common challenges. Research indicates that receiving support from colleagues and sharing success stories about using technology to enhance learning is essential for ECE providers.[18] Learning communities can be in-person gatherings or can be hosted in online settings. We note that learning communities need not be limited to ECE providers. Including families, advocates, and other key stakeholders might introduce new perspectives that are useful to providers who seek to better understand both the children in their care and effective practices identified in research.

Give providers a voice in technology development and policymaking. When technology developers create devices and software without truly understanding ECE settings and how young children learn, their technology may be of limited utility to ECE providers. However, when devices and software are designed to meet the needs of providers, providers may be more likely to use that technology in the classroom. Explicit opportunities should be provided for ECE providers and child development experts to get involved in the technology development process. In a similar fashion, policymakers should consider bringing ECE providers into policy discussions so that provider insights on barriers and needs are taken into account. This may result in policies and programs that better support providers, children, and families, and create the stakeholder buy-in that can be important to successful implementation.

The Bottom Line

Technology use in ECE settings can benefit children only if it is carefully integrated to support learning by a confident, informed guide. Yet ECE providers operate under substantial time and resource constraints, and adding new

tools to support learning can be challenging. Without support, ECE providers may be overwhelmed by these and other barriers to effectively integrate technology into ECE settings. Unfortunately, providers who serve children from low-income families may face the greatest barriers. To ensure that all young children can effectively use technology as a learning tool—particularly children from low-income families—ECE providers must have the supports they need to become strong technology curators, facilitators, guides, and users. These supports include clear guidance and standards for technology use, training that considers different levels of provider and child digital literacy, planning time to explore technology, and stronger connections to the larger community of stakeholders through learning communities and involvement in technology development and policymaking.

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