To Tech or Not to Tech?

The Debate about Technology, Young Children, and the Library

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The authors' panel, entitled "To Tech or Not to Tech: The Debate and the Research around Technology, Young Children, and the Library," took place at the 2018 ALA Annual Conference in New Orleans. This article is based on that presentation.

Recent discussions on the ALSC electronic discussion list signaled a need for a better understanding of the research around young children and technology. The controversy and debate around using technology with young children has been going on for several years. While research is emerging in this area for libraries, there is still not a huge body of research out there and data do not yet exist at this point that answer some of our most basic questions of how technology use will affect children long term. However, new research in this area is emerging regularly so it is important to have opportunities to explore the findings that do exist. Ultimately, we see that a majority of families are already using technology with young children so libraries can play an important role by providing guidance on what to use and how to use it effectively with their young child. We wanted to share the content of our panel presentation with readers to further disseminate the research as well as some recommendations for effective practices that can impact and enhance practice, especially when working with families.

Our goals for the panel were (1) to share some of the research that has explored technology use by young children and their caregivers; and (2) provide some practical guidance in the form of scenarios to help attendees understand some ways that technology use with young children and their caregivers might come up in the workplace, and how best to approach it when it does.

The panel was structured in three main sections:

1. We provided a quick overview of some of the research that exists, which comes directly from the bibliography that can be found on our website: https://sites.google.com/view/ycnml18/home.

2. We offered several scenarios that may occur in daily work around technology with young children. For each scenario, we identified information needs and introduced options





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for how to address them and how the research can inform those options.

3. We provided some effective practices and concluded the session with news about upcoming projects in the area of technology, libraries, and young children. Visit https://sites.google.com/view/ycnml18 to learn more about this.

Research Overview

What is the research saying with regards to technology and young children and their caregivers?

According to a 2017 report by Common Sense Media:[1]

- Children ages zero to eight are spending more than two hours with screen media per day (we don't know if this is passive versus active screen time; and this is based on parents reporting);
- 42 percent of parents report that the TV is on all or most of the time at home;
- 98 percent of homes own a mobile device; and
- 35 percent of screen media exposure is on mobile devices.

We can see from this report that children and their caregivers have media readily available to them, they are using and consuming media, and media is a prevalent part of their daily lives.

A 2016 survey from the Technology in Early Childhood Center (TEC) at the Erikson Institute[2] shows that 85 percent of parents let their children use technology at home, and 86 percent of parents said they are happy with the ways in which their young children access and use technology, believing there are benefits to this use, such as positive child development, literacy learning, and school readiness and success. However, parents also worry about some of the disadvantages present in the use of technology among young children, such as excessive screen time, inappropriate content, less time for outdoor play, and thus less active play.

Also in 2016, the American Academy of Pediatrics (AAP)[3] revised their guidelines to recommend:

- unplugged, creative play for infants and toddlers except video chat;
- high-quality educational media for children ages two to five years that is watched with a parent or caregiver for mindful media use and is limited to one hour a day; and
- that for children six and older, media should still be watched with a parent or caregiver, for mindful media use, and should be balanced with other activities for a healthy media diet.

We can see, from statistics like the ones found by the TEC Center at Erikson and Common Sense, that parents are using technology with their children, and pediatricians want to help encourage a balanced, healthy media diet for families and young children.

A big theme we see in the research is that technology is *one* of many learning tools for young children—not the only tool available to them. I-LABS (Institute for Learning and Brain Sciences) at the University of Washington emphasizes the importance of knowing why a child is using technology, whether it is for entertainment or education. If it's for education, it's important to think about what children are able to learn at what age and how that developmental progression affects their ability to learn from screens. I-LABS research has studied language learning among infants and has shown that live human interaction works best for infants to learn language.[4]

For toddlers, they are able to learn to a certain extent from screens with lots of live human interaction that scaffolds the interaction. However, even if they show some learning from screens, they're going to show more meaningful learning from a live human.[5] This is partly because children younger than two-and-a-half to three years of age cannot distinguish 2D from 3D on screens.[6] They see a screen image as the same as a real object, which hinders their ability to understand that what is taking place on the screen is not real.

Furthermore, Lisa Guernsey, a researcher with New America, talks about the three Cs: child, context, and content,[7] with respect to technology use. We need to think about the individual *child*—not every child learns the same way or interacts with technology in the same way. Parents know their children best and we can help them to make good decisions about media. We also need to think about the *context* of the media use—is it intended for entertainment or education? If it's meant to be educational, how does it map onto what children are learning at various ages? Finally, we need to think about *content*. Is the content of the media interactive, social, positive, and appropriate in terms of age and cognitive development? How can we help by recommending high-quality media to families for their young children?

Another thing to think about is how media and technology are being used by families with children with special needs or by families with low socioeconomic status. Several reports from the Joan Ganz Cooney Center mention the importance of considering all kinds of families' needs when using and recommending media.[8] Technology has been used extensively for children with communication disorders for years. The platforms have changed with tablet technology so the devices are now mainstream. This means children who use communication devices might now use an iPad instead of a dedicated Augmentative and Alternative Communication (AAC) device.[9] These might be children with autism spectrum disorder or children with other conditions that affect communication. However, research is also suggesting that tablets are helpful

with the overall academic learning for kids with disabilities because the tablets themselves are engaging, children enjoy them, the tablets offer another form of print motivation, and children will stick with the tasks on the iPad because they like them. For kids who struggle academically and have to work harder to learn how to read, for instance, keeping them engaged while learning is key.

So what does this research looks like on the ground in libraries with young children and their caregivers? Following are five different scenarios to give you an idea of what it looks like to use and share media with young children and their caregivers.

Scenario One

An aunt is looking for resources to help her nephew with autism interpret others' emotions through facial expressions. She explains that he likes to look at picture books with her, but she wants to use something more portable as they take public transportation to some of his therapy appointments and she'd like to do something "useful" during that time.

Here are some ways to address this scenario using media mentorship:

- If the child is not present, ask her to tell you a bit more about his age and abilities and what he likes and what motivates him. (Is he verbal or nonverbal? Does he use an AAC device?)
- If the child is present, talk directly to the child, and get feedback/responses from the aunt as necessary—don't assume he can't or won't respond to you, given enough time. If he uses a communication device, give him time to use it without prompting help from his aunt until you are sure he needs help answering you.
- Since she wants something more portable than print books, look through your library's offerings of e-books (i.e., Tumblebooks) to see if any address emotions/feelings and have stories that they can read or listen to.
- Suggest apps for this specific purpose—if you are stuck and can't think of any, offer to send her weblinks to either the Apple iOS or the Android versions via email or text later so she can decide if she wants to download them onto her own device.
- Ask if he attends any library programs and make sure to invite/encourage the child and caregiver to attend, especially inclusive ones that use sensory materials and are open to all children so he can interact with peer models with and without autism.

Research-Based Discussion of This Scenario

In this scenario, we can see that the caregiver is demonstrating both usage of technology and a desire for quality media, as well as a way to help her nephew through challenging moments in life using technology. She is viewing technology as a tool that can play a role in supporting a variety of different learning needs. Librarians can help caregivers understand how to effectively use technology as a tool and what kinds of devices to use. Building on the research about which apps are truly educational[10] and understanding how children are actually learning using apps,[11] we can start to recommend media and work with the caregiver to help her find what she needs for her nephew. This is a perfect media mentorship moment—meeting an information need with resources and tools.

Scenario Two

A father has a child with motor delays due to a developmental disability. The father is looking to help his child learn how to make letter shapes more clearly. Although interested in letters and able to recognize most of the alphabet, the child is having trouble holding a pencil and making letter shapes at the same time. This is causing frustration in school where all the child's friends are learning to print nice neat letters.

Here are some ways to address this scenario using media mentorship:

- Recommend some letter apps and show the child and caregiver how to use the apps. Emphasize that making the shapes with his fingers will help his brain remember their basic shapes and build up the muscles in his fingers so that he can better hold a pencil.
- If his school isn't already providing them, look up some pencil grip options (even wrapping elastic bands around the pencil can help) or egg-shaped crayons and markers that are easier to hold.
- See if the child likes making marks on an iPad screen that he can easily erase if he thinks he's made a mistake. He can start by using his finger and then move on to a stylus.
- Suggest playing with play-dough. Find a good recipe to try at home and explain that those muscles are getting a workout with every roll and squeeze, plus he can make letters out of the dough to help him learn their shapes.

Research-Based Discussion of This Scenario

This is an example of how technology can be a tool, whose use is mediated by a grownup, as well as opportunities for joint media engagement for father and child. We can also see that the father is concerned about how the technology is being used, more than the fact that the technology is being

used. This is in line with many studies finding that parents are less concerned than previously thought about technology use by children;[12] instead they want information about how to offer quality media for children. Several studies demonstrate ways in which devices such as tablets can be useful for helping young children learn important skills.[13] Using the Diverse and Inclusive Growth Checklist, created by KIDMAP[14] (www.joinkidmap.org), a librarian can also look for diverse representation in the media they recommend to the father for added representation.

Scenario Three

A mother comes to the library with her preschool-age child and asks if she can work on a Microsoft Word document on one of the public computer stations. She tries to keep her child under control, but her task drags on. The child is getting antsy and the mom is getting frustrated.

Here are some ways to address this scenario using media mentorship:

- Approach and gently distract or refocus the child for a few minutes to defuse mom's frustration; just chat with them for a few minutes.
- Bring stamps, stickers, crayons, and paper and encourage the child to make something (e.g., a card, a bookmark).
- Bring a few puppets, dolls, blocks, etc., and encourage some dramatic play.
- Ask mom if there is anything you can do to help her with her task. It is clearly stressing her out, so see if there is something you can do to alleviate that; she might need something simple like a dictionary.
- Ask mom if it's okay to share book/play apps with the child on the library's tablet, which is preloaded with preschool apps or on the public computer next to her (with Tumblebooks, etc.). If it turns out that the child will have to be there for a bit longer, offer to bring the tablet to them to see if the child will watch a few book apps while mom works. If staff changes over, let the new staff member know to pay some attention to them and see if there is anything else they can do to help the mom get her task completed. It is clearly important, so work with what you have to help them.

Research-Based Discussion of This Scenario

This scenario is a bit different, in that both the parent and the child have a need for the use of technology, though those needs are different. The work the librarian is doing to help the mom and interact with the child is grounded in the work of the Fred Rogers Center,[15] which focuses on the importance of considering the whole child when interacting with media. Also, the U.S. Department of Education brief[16] supports this kind of interaction around technology. This is a wonderful example of media mentorship, if perhaps an unexpected one—by helping the mother with her task and by interacting with the child, you're offering a positive experience around technology and you're modeling constructive technology use. If appropriate, once the mom completes her task, you can offer some ideas and strategies on how to interact with her child using technology. It's possible that you can build a relationship with that mother and with the child and use that relationship to build toward a discussion about technology use and recommendations.

Scenario Four

A grandmother comes into the library looking for good apps that will help her three-year-old grandchild learn how to read. They are a multilingual family, speaking English and Tagalog, and a multigenerational household with grandparents, parents, and grandchildren living together.

Here are some ways to address this scenario using media mentorship:

- Clarify her "learn how to read" goal and try gently to reframe that goal to provide the grandchild with early literacy experiences that will translate into skills for later reading success.
- Encourage the child's sustained exposure to heritage or home language, including reading in Tagalog, especially with fluent Tagalog speakers. Research has shown that children should listen to fluent language and fluent reading in their native language.
- Suggest some playful, vocabulary-rich apps for co-viewing, in Tagalog and English. If you do not immediately know of any apps that support Tagalog, offer to do some research and get back to her with developmentally appropriate results.
- Share any library resources (flyers, etc.) about early literacy and digital media for young children with her to take or access at home
- Invite the family to come to a storytime that might offer app activities.
- Emphasize the grandchild's developmental needs for interaction over solo activity. At this stage of development, preschoolers learn language (and therefore early literacy skills) via engaged, interactive relationships with loving caregivers.

Research-Based Discussion of This Scenario

This is also an excellent moment to use your media mentorship skills—offer quality resources, ones that are diversity-rich and emphasize learning through play. This also

exemplifies joint media engagement,[17] especially across two languages and cultures, sharing stories and building a strong vocabulary. You can also consult the Joan Ganz Cooney Center reports on diverse families using technology[18] as well as the report titled "Learning, Is There an App for That?,"[19] which both talk about how children learn using technology—these will help inform the work you're doing as a media mentor.

Scenario Five

Your community is interested in more opportunities to introduce computational thinking and the basics of coding to preschoolers. To meet this need you are thinking about trying to support this in storytime but are unsure of how to get started.

- Computational thinking (CT) is a process that helps us create possible solutions for complex problems. The solution is presented in a way that humans and/or computers can understand.

- CT involves breaking big problems into smaller parts (decomposition), finding patterns (pattern recognition), simplifying ideas to what is important (abstraction) and creating a specific order of actions (algorithmic design)[20]—a recipe, if you will, to complete the task.

- CT can be supported in both unplugged activities (building, playing, reading, talking, etc.) and in using new media (coding, building, designing, etc.). Many storytime activities can support both early literacy and CT if included with intention. For example, in a preschool storytime about robots, CT skills are strengthened when kids: talk about a story's sequence (algorithmic design), build tin can robots with blank tin cans and miscellaneous magnetized parts to represent the robot's antennae, sensors (eyes), arms, etc. after reading and talking about what robots are (decomposition, abstraction), program a "code-a-pillar" to travel to an apple (algorithmic design, abstraction), dance as a group to a song like "Clap Your Hands" by They Might be Giants (pattern recognition), build a robot (as a group) using the Sago Mini Robot Party app projected on the storytime big screen or on the library's iPad Pro, and read, retell, and talk about robot stories and books like Jon Scieszka's *Robot Zot*; James Dean's *Pete the Cat: Robo-Pete*, or David Carter's *If You're a Robot and You Know It* (decomposition, pattern recognition, algorithm design).

Research-Based Discussion of This Scenario

This scenario offers a new way to think about media mentorship and sharing new media with families and children in your library. Drawing on joint media engagement, we can see opportunities for children and adults/caregivers to build and learn together using books, traditional craft materials, and new media, which deepens the learning and offers more meaningful engagement opportunities with the technology for children and families.

Furthermore, we see technology as a tool here, too; a means to discover and explore and learn new skills. Introducing concepts like pattern recognition and decomposition in developmentally appropriate ways during a program like storytime helps grown-ups understand the similarities between early literacy and computational thinking skills and learn new ways to support both. Lastly, we can see opportunities to make connections between what children are using in their media-based play with real life, thus situating the learning in their lived experiences.

Conclusion

In 2014, ALSC ran a nationwide survey asking about new media use in libraries with young children.[21] With 415 responses, more than 70 percent of respondents said they were using some form of new media in programming for young children, including in storytimes. Tablets were overwhelmingly selected as the device of choice. Fifty-eight percent of respondents indicated they planned to increase their new media availability in programs and services for youth going forward. The infographic from this study is available on our website (https://sites.google.com/view/ ycnml18/home).

We re-ran the survey during August 2018 with the original questions to see what has changed as well as additional questions focused on attitude and knowledge as well as use and evaluation of diverse media. We will share findings from the survey in an upcoming article and presentations.

Finally, we will be applying for an IMLS grant to study this phenomenon further—we are currently in the planning stages for what that research will look like going forward.

As you think about technology and media mentorship in your own libraries, consider these questions:

- What is the screen media culture in your library with respect to young children and their caregivers?

- What excites you about screen media with young children and their caregivers?

- What questions/concerns do you have about screen media with young children and their caregivers? &

Visit https://sites.google.com/view/ycnml18/home to find the annotated bibliography we created for this panel. We are continuing to add to it as we learn about new research. If you would like to contribute your answers, feedback, or suggestions, please contact us at childrenandtechresearch@gmail.com.

Putting Practices into Play

As you can see throughout the scenarios, there are several common and effective practices emerging from research that are important for using technology with young children. The following research-based recommendations are important to incorporate in both your own use of technology with young children as well as the advisory work you do to recommend and share media with caregivers and the young children in their care:

1. **Remember that children are social and like interactivity.**[22] Kids learn best when they explore concepts and content through meaningful social interactions, so it is important to offer media experiences where children actively play, read and create with the media alongside others. The concerns around screen time grew out of the phenomenon of passive screen time in which a child consumes the media alone without active participation. But high-quality apps and tablet use are different—they offer interactive opportunities that can be connected to learning goals. We know that when children make decisions and have control within the media, the learning is deeper for children. Select and recommend media that involves more than "point and click"—that offers choices and enables the young child to direct the play in order to offer meaningful learning opportunities.
2. **Practice, and encourage caregivers to practice, joint media engagement or co-viewing.** Encourage your parents and caregivers to read, explore and play with their children, especially when it comes to digital media use. Parents are their child's first and best teacher—this applies to media use as well. When joint media engagement happens, grown-ups can ask questions, talk about what the child is seeing and learning, and scaffold the experience for the child. A shared media experience deepens and enriches the experience overall for children. Bring screens into the larger media experience in families, including books, music, movies, apps, television, etc.
3. **Support social interaction through video-based media.**[23] In a study of 24- to 30-month-olds, video chat was shown to be a separate category of screen media that needs special attention. The study found that children learn from video chat as much as live interaction. This medium does not behave like two-dimensional media, presumably because the child is interacting in real time with the other person, and in most households this is a person the child knows. So if you have military families in your community, or families with friends and relatives in other countries, you can talk with them about how this kind of screen time helps children learn and maintain relationships with loved ones.
4. **Prioritize foreground over background media.**[24] Foreground media refers to media that you're intentionally using together—it's the focus of what you're doing; this could be a movie, a family app, or playing a video game all together as a family. Background media on the other hand describes media to which children do not attend, also known as secondhand media, and often contains content that is not developed for children. One example is having the news on while you're cooking and your children are playing. (Note that radio is not considered secondhand media.) Background media isn't always bad—we all need to get things done around the house. But background media can hinder the depth and scope of children's unstructured play, which in turn affects vocabulary and comprehension due to a lack of rich conversation. Talk with caregivers about the importance of foregrounding appropriate media so that they're being intentional about what children are watching and consuming. Foregrounded media offers opportunities again for joint media engagement and rich conversation.
5. **Encourage caregivers to make connections to life.** It is important to take what the child is doing with technology and then connect it to real world. When you or a parent or caregiver is using new media devices with children and playing with different kinds of software, find ways to connect those experiences with the world around them, especially with younger children as they are still learning the difference between 2-D and 3-D images versus real life objects. If you're playing with an alphabet app that shows vehicles, talk about where you might see these vehicles in real life, in your neighborhood, so that the child can look for those vehicles during their daily activities.
6. **Scaffold technology use.** This means starting with something the child knows and can do easily and building up from there, like you're building a scaffold around an emerging building. Children will learn new information and skills, and then see connections between what they're learning, when you and the parent or caregiver is sharing the experience and offer additional and varied learning opportunities.
7. **Encourage caregivers to model good technology use.** Balance is important for grown-ups as well. Talk with parents and caregivers about how they're using technology, letting them know that their children are watching them and learning about digital media use from how they use their devices. Be intentional about shared screen time and even time away from all devices to emphasize balance and the importance of face-to-face time. Ultimately, what is most important is the content of the play—does this type of play benefit from digital media? Then use a device. If not, try provide another play experience relevant to the child's needs to again emphasize that balance. There is a role for digital and screen-free experiences—they're a piece of the pie, not the whole pie. Use new media intentionally, use it well.

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