



"Look What I Made!" Open-Ended Apps that Spark Creativity

Resources / Publications / Young Children / November 2017 / "Look What I Made!" Open-Ended Apps that Spark Creativity

HOLLY CARRELL MOORE

Whatever the medium—wooden blocks, paint on paper, multicolored tape on recycled materials, or digital images on screens—it's important for young children to experiment and create in ways that are meaningful to them. Although digital tools (e.g., desktop computers, tablets) are often associated with seeking information and accessing media, they can also promote children's active engagement and creative exploration. More than 25 years ago, researcher Celia Genishi and her colleagues studied preschoolers and kindergartners composing computerized drawings using a modified version of Logo (Genishi 1988; Genishi & Strand 1990). Even when young children were not able to verbalize why they were making something, they still conveyed that the *making* was important. Children could use computers to make meaning, often in process-oriented ways, as this exchange between two preschoolers shows (Genishi & Strand 1990, 267):

Kate: *What is it? [The object on his screen]*

Jackson: *I don't know.*

Kate: *Then why'd you make it?*

Jackson: *I don't know. Why'd you make that?*

Kate: *I'm making something.*

Today, using more advanced digital tools and carefully selected programs, children can continue to actively create and communicate their interests, thinking, and understandings of the world around them, especially when they are supported by caregivers and teachers who thoughtfully arrange the tools and programs to support students' playful explorations.

While being careful to avoid children's overexposure to screen time and passive, nonsocial technology use (AAP 2016), early childhood professionals have developed ways to share technology and digital tools in culturally responsive and developmentally appropriate ways (NAEYC & Fred Rogers Center 2012; Plowman & McPake 2012; Donahue & Schomburg 2017). Even so, as more children have access to technology at home and school, caregivers and teachers continue to need support and professional development to incorporate meaningful technology experiences into classrooms (Herold 2017). As teachers and caregivers seek to deepen their digital pedagogy knowledge, researchers suggest that children's play and learning via digital technology should be supported by adults who "monitor activities, help when things are difficult, provide encouragement and praise for achievements, and assist children in managing their emotions if they get frustrated" (Plowman & McPake 2012, 31). Additionally, the NAEYC and Fred Rogers Center joint position statement on technology urges educators to consider how they might incorporate technology and interactive media "in ways that can optimize opportunities for young children's cognitive, social, emotional, physical, and linguistic development" (2012, 2).

As with any material they consider for inclusion in an early childhood classroom, professionals inviting digital exploration need to think about many factors, including classroom organization and management issues, (see "Organizing Spaces for Digital Play and Exploration") and the types of tools/programs to provide. This article focuses on the appropriate use of tablets with young children, with a specific emphasis on children's playbased exploration and creation.

Organizing Spaces for Digital Play and Exploration

Organizational and management issues regarding digital play raise a host of questions: Should there be a special area for tablet-related play, or can students take the tablets anywhere in the room? Should there be multiple tablets for children to use or only a single one? What kinds of apps should be included?

In my research (Carrell Moore 2014; Carrell Moore & Adair 2015) and teaching, I have observed many ways teachers have incorporated tablets into their preschool classrooms. All of my observations have been in environments where children had ample time and space to explore their interests in center-based activities. In some classrooms, teachers included both desktop computers and tablets in a computer area; in others, teachers separated computers and tablets, arranging single, paired, or multiple tablets at small tables. Some teachers allowed tablets to be carried to almost any center (except the sensory table and any area including water) and planned time not only for play and exploration but also for specific guided-learning activities.

When devices were positioned so that students could see each other's screens, most children enjoyed keeping an eye on classmates' actions. This allowed them to discover program tools and functions, and it fostered interaction between students. Children were able to build off each other's ideas while learning to use digital tools and more effectively make creations meaningful to themselves and their peers.

In addition to using a variety of spatial arrangements, teachers also differed in how they managed children's engagement with computers or tablets. Some teachers used timers and waiting lists to regulate the amount of time children spent working with digital tools (Wang & Ching 2003) and used classroom rules to dissuade onlookers. Others let children stay at computers as long as they were interested and allowed them to congregate around a device to offer input and assistance to engage in social interactions (Brooker & Siraj-Blatchford 2002; Heft & Swaminathan 2002). Management issues often include teachers' own perspectives about technology, their classroom resources, and their careful consideration of children's culture, home experiences, and social and emotional, cognitive, physical, and linguistic development.

Selecting apps for open-ended exploration

Today, one of the most difficult technology-related decisions for teachers is choosing appropriate apps. One way to narrow the field is to consider what type of apps might help children meet learning objectives while still being engaging. Some apps allow users to work on different concepts (e.g., colors, shapes, letters, numbers) through games that feature matching, puzzles, problem-solving activities, or task completion. Other apps offer information about topics of interest, such as sea life, animal habitats, insects, and forms of transportation. Still others are related to literature, including e-books, interactive books, and activities based on well-known book characters or plots. These types of apps can offer learning opportunities; but for children to engage in creative meaning making based on their interests, they need opportunities to explore open-ended apps that allow some individualized control over creating content.

Many open-ended apps let young children experiment with digital versions of paint, crayons, magnets, stickers, stamps, and blocks—and even puppets and characters. Warren Buckleitner (n.d.), editor of *Children's Technology Review*, has noted that "iPads will never replace the smell of freshly peeled crayons, but they can offer children a new way to create, complete with ... an 'undo' option that encourages experimentation." Tablets should not be used as a substitute for the important play and exploration children do with physical objects and divergent materials, but they can be tools for creative expression when paired with thoughtfully selected apps.

To find high-quality, open-ended apps, consider the following (adapted from Carrell Moore & Adair 2015):

- Have text-based instructions been minimized?
- Does the user have adequate opportunity to control the app and make a variety of choices?
- Are there multiple tools and features for exploration, experimentation, and creation?
- Can the user control sound features?
- Does the app respond easily to user manipulation?
- Is there a wide variety of template materials, where appropriate (e.g., backgrounds, stickers, blocks)?

In classrooms I have observed, children using openended apps experimented with program content, tools, and design—often in socially interactive ways. Four types of open-ended apps that early childhood educators may want to include in their classrooms are apps for drawing and painting, scene creation, scene recording, and digital material manipulation. The benefits of these types of apps are discussed in the sections that follow. For specific apps, see “Suggested Open-Ended Apps for Preschoolers and Kindergartners” (p. 25).

Drawing and painting apps

Apps for drawing and painting enable users to design and create images via a variety of tools, such as digital paint, crayons, markers, and pencils. Some programs allow multiple fingers to draw simultaneously (such as Doodle Buddy for iPad), while others limit usage to only a single finger or a stylus. Through these types of apps, students can experiment with drawing or coloring (via finger or stylus) using endless amounts of color on a variety of backgrounds, adding stickers and stamps, and using templates and background images to prompt drawing ideas. I’ve observed prekindergartners create representational images of people, animals, scenes, and objects; practice drawing and typing letters and names; draw nonrepresentational designs and patterns; and cover the screen with color and stamps.

For creative meaning making, children should explore open-ended apps.

Some programs include drawing prompts, such as voice prompts and shape outlines. In a prekindergarten classroom, I observed Glenn, an English language learner, making connections with another boy, Tony, while using a drawing prompt in Sago Mini Doodlecast.

Glenn had made previous attempts to engage in pretend play with Tony, but his emerging English skills were sometimes misunderstood. On this day, inspired by the app prompt “What moves on wheels?,” Glenn drew a race car. His race car drawing skills attracted Tony’s attention. The boys sat side-by-side at a small table, each with his own tablet. As they drew their race cars, they glanced at one another’s screens, mimicking each other’s race car designs and commenting on each other’s drawings. Through their responses to a drawing prompt, the boys found a common interest. They engaged in collaborative design, and their conversation opened up as they drew digitally alongside one another.

Children can use digital tools to explore and create—when they are given equal opportunities to learn.

Scene creation apps

These apps are slightly different from drawing and painting apps in that they let children create designs using preexisting background scenes or line drawings and add color and images, such as stamps, stickers, and magnets. Through such apps, children can explore with color on predrawn images (similar to paper coloring pages but with far more options for adding and modifying colors and patterns); experiment with spatial design (e.g., placing endless numbers of magnets or stickers and resizing and manipulating as needed); and create patterns, nonrepresentational designs, and representational designs. I’ve observed 3-, 4-, and 5-year-old children playing with color and pattern, creating both abstract images and representational scenes while practicing academic skills (e.g., counting and naming letters and numerals).

Even simple digital coloring pages offer opportunities to experiment with color and design. One prekindergartner, Cherry, chose a farm scene coloring page in Draw & Tell HD. She initially tapped randomly around the screen; as sections filled with color, she exclaimed, “I don’t know what I’m doing!” However, she soon noticed icons that allowed her to add and erase colors. Cherry became more selective in her color choices and spent time adding different hues, viewing the result, and making changes. When she was satisfied with the color arrangement, Cherry eagerly shared her completed image with her tablemate and the teacher. She revisited this program feature often over many weeks, experimenting and sharing her completed designs with others.

Scene recording apps

Scene recording apps allow students to create short recordings of their creations and often incorporate elements of drawing and painting, and/or scene creation. Users can even record the process of their work as they create. With these apps, students can select or create

background templates, record dialogue and character movement, record voiceovers for existing analog drawings/creations, or record the process of their drawing in real time. After brief guidance on how to use the program tools, I’ve observed students (especially older 4- and 5-year-olds) recording their own puppet shows or cartoons—alone and with others—and recording their drawings and voiceovers.

Suggested Open-Ended Apps for Preschoolers and Kindergartners

Apps change quickly and vary in quality; the free versions may contain pop-up ads or in-app purchases. Download apps in advance and try them yourself—as you would any classroom materials—before you give them to the children.

App	Type	Platform	Benefits
ABC—Magnetic Alphabet (Lite) for Kids	Scene creation Digital manipulation	iPad, Android	Includes letters, numbers, multiple seasonal magnet packs, and voiceover for the letter/numeral names when tapped. Users can explore patterning, letter/numeral names, and create scenes that could be a springboard for storytelling.
Book Creator	Drawing & painting Scene recording	iPad, Android	Offers drawing, typing, photo-importing, and voice-recording tools; e-books can be saved/shared as video, ePub, or PDF. Includes a “read-to-me” function. Users can create fiction and nonfiction multimedia texts that can be revisited and shared to other devices outside the classroom.
Draw & Tell HD	Drawing & painting Scene creation Scene recording	iPad	Provides drawing/painting tools, “sticker” manipulation/recording, voice recording. Files are saved automatically and can be exported. Users can engage in storytelling and demonstrate visible thinking/concept explanation.

App	Type	Platform	Benefits
Geoboard	Digital manipulation	iPad, Web version	Includes different size/shape boards, multicolored rubber bands, shading, grid-numbers, drawing, and math-text features. Users can explore shapes, vertices, grids, and numbers.
Monster Mingle	Digital manipulation	iPad, Android	Offers multiple items for creating a monster (e.g., bodies, eyes, noses, arms, legs, wings) who can be moved to different locations (sky, water, land) and engage in a variety of activities. Users can create monsters and engage in dramatic play
Quiver	Drawing & painting (coloring)	iPad, Android	Provides online coloring pages for download (some paid, some free). When app is pointed toward a coloring page, the design becomes 3-D with some interactive features. Users can explore science, community, and seasonal concepts, depending on the color sheets available online.
Sago Mini Doodlecast	Drawing & painting Scene recording	iPad	Offers drawing prompts and the ability to record the drawing session (image and sound) via automatically saved videos that can be shared. Users can create stories based on the prompt, talk and create simultaneously, and voice their thinking.
ScratchJr	Scene creation Digital manipulation	iPad, Android	Includes multiple backgrounds, characters, sounds, and drawing tools for character creation, as well as coding blocks to animate the characters. Users can create animations, stories, or games in an infinite number of ways, while engaging in simple visual programming.
Shadow Puppet Edu	Scene creation	iPad	Provides backgrounds, images, image searches, image importing, and maps that can be combined in a specified order for recording with voice-over; the resulting video can be saved and shared. Users can create multimedia videos to share stories, songs, and rhymes.

App	Type	Platform	Benefits
Sock Puppets	Scene recording	iPad	Offers a selection of puppets, backgrounds, changeable voices, and props that can be recorded, saved, and shared. Users can create narratives and explore social and emotional learning concepts.
Toca Blocks	Digital manipulation	iPad, Android	Includes blocks, characters, and items that can be combined to make new features; these can then be combined to create a digital world that the player can move the characters through. Users can build multiple worlds, play inside them, and share them with others.
Toca Mini	Digital manipulation	iPad, Android	Provides outline character shapes, animated facial features, stamps, and colors for creating creatures. Users can create characters in a simple format and share photos of their character.
Toontastic 3D	Scene recording	iPad, Android	Offers premade characters (e.g., astronauts, pirates, princesses, and animals), tools for drawing additional characters, backgrounds, voicerecording, and music for recording shareable animated video files. Users can create animated stories, newscasts, or nonfiction videos (e.g., about family, friendship, or the community).
Train Kit	Digital manipulation	iPad	Includes tracks, bridges, tunnels, trains, and scenery that can be combined in multiple ways. Users can explore trains by designing their own digital tracks and viewing their running train from a bird's-eye view and a conductor's view.

Digital manipulation apps

With digital manipulation apps children can digitally explore other types of materials, such as blocks, rubber bands, and even monsters and trains. Children can construct, deconstruct, and experiment with digital versions of physical objects. Some apps let children explore a single material, and others allow more intricate interactions. For more complex apps, teachers can demonstrate how to use the tools and then let children explore. In my district's kindergarten classrooms, we shared a whole-class example of how to move ScratchCat using ScratchJr coding blocks, and within minutes students quickly began manipulating the coding blocks on their own tablets. Some children even figured out how to add more characters, change the backgrounds, and record sounds.

Mapping Technology onto Your Curriculum

Warren Buckleitner

Experienced early childhood educators know that new gadgets come and go, but the essentials of child development are constant. When evaluating a new app or device for the classroom, consider these questions.

1. Does it promote active learning? Children's minds—and often their fingers—should be busy to encourage deeper thinking. However, not all apps achieve this simple goal; some are didactic, talking down to children. Look for apps that foster interaction and activity
2. Does it support your idea of good practice? An app designer may have views on learning that differ from yours. Dig deeper to uncover the motives behind the app. And be wary when it comes to the word "free." The adage "You get what you pay for" is especially true for apps; free apps are often just samples or promotional vehicles that can tease a child and waste some valuable playtime. Invest in apps that unlock the true potential of your hardware.
3. Are you a media mentor? Too many early childhood educators I have observed let fear determine how they use unfamiliar tools, like tablets. Some keep new devices locked away so they won't be broken. Don't be afraid to try new apps, explore, and problem solve as part of your own ongoing learning process.

A shiny new tablet is only as good as the apps that are on it. That's why we created CTREX (Children's Technology Review Exchange), a members-only (by subscription) forum designed to help early childhood educators find and share opinions on the latest apps. The following list of CTREX features has URLs that provide complimentary samples of the site's members-only content:

- A search function that works by key word or any combination of age, subject, and platform. Need more guidance? Use the “Editor’s Choice” and “All Time Best” lists to browse apps. If you are looking for an effective starter app, for example, try Busy Shapes: <http://reviews.childrenstech.com/ctr/fullreview.php?id=17631>.
- The ability to comment and share opinions. In some app reviews, readers will see equally valuable ideas resulting in very different ratings: <http://reviews.childrenstech.com/ctr/fullreview.php?id=19696>.
- Reviews and comments by experts with no commercial ties. Each review is authored, so you can see who wrote it: <http://reviews.childrenstech.com/ctr/experts.php>.
- Publishers’ comments. CTREX created a forum to give publishers constructive feedback and an opportunity to respond to reviews.
- A hub especially for early childhood educators: <http://bit.ly/ctrex-ece>.
- A DIY rubric system. Apps vary greatly, which is why the rubrics used to evaluate them must also vary. CTREX lets you create and save your own rubrics.
- Custom lists and data exporting. Want to send app recommendations to families? CTREX lets you export text or create a custom link that leads to a curated set of products.

Warren Buckleitner, PhD, is a former preschool teacher and senior consultant at the HighScope Educational Research Foundation, where he did the research that led to CTREX. He teaches interactive design at The College of New Jersey.

Conclusion

Tablets offer many possibilities for children’s play and exploration. In addition to concept-teaching apps, digital books, information-based apps, and gaming apps, teachers might consider including open-ended apps that foster creativity by allowing children to experiment and express their ideas with digital tools. As with any materials, make sure to test each app first; check for changes, in-app purchases, and advertising.

From early studies of children’s computer-based designs (Genishi 1988; Genishi & Strand 1990) to current observations of children’s playful experiences with open-ended tablet-based apps, children have demonstrated their ability to use digital tools to explore, experiment, and

create according to their own interests—when they are given equal opportunities to learn. When children are provided thoughtfully selected technology tools, are supported by teachers, and are allowed to sit alongside one another and investigate together, they can use digital tools and materials to express themselves and connect with each other in meaningful ways.

References

AAP (American Academy of Pediatrics) Council on Communications and Media. 2016. "Media and Young Minds." *Pediatrics* 138 (5): 1012. <http://pediatrics.aappublications.org/content/pediatrics/early/2016/10/19/peds.2016-2591.full.pdf>.

Brooker, L., & J. Siraj-Blatchford. 2002. "Click on Miaow!": How Children of Three and Four Years Experience the Nursery Computer." *Contemporary Issues in Early Childhood Education* 5 (2): 251–73.

Buckleitner, W. N.d. "Art, Creativity, and Music Apps for Early Learning." *NAEYC For Families*. Blog. <http://families.naeyc.org/learning-and-development/music-math-more/artcreativity-and-music-apps-early-learning#>.

Carrell Moore, H. 2014. "Young Children's Play Using Digital Touch screen Tablets." PhD dissertation, University of Texas, Austin. <https://repositories.lib.utexas.edu/handle/2152/24930>.

Carrell Moore, H., & J.K. Adair. 2015. "I'm Just Playing iPad": Comparing Prekindergarteners' and Preservice Teachers' Social Interactions While Using Tablets for Learning." *Journal of Early Childhood Teacher Education* 36 (4): 362–78.

Donahue, C., & R. Schomburg. 2017. "Technology and Interactive Media in Early Childhood Programs: What We've Learned from Five Years of Research, Policy, and Practice." *Young Children* 72 (4): 72–78.

Genishi, C. 1988. "Kindergarteners and Computers: A Case Study of Six Children." *The Elementary School Journal* 89 (2): 184–201.

Genishi, C., & E.B. Strand. 1990. "Contextualizing Logo: Lessons from a 5-Year-Old." *Theory into Practice* 29 (4): 264–69.

Herold, B. 2017. "Poor Students Face Digital Divide in How Teachers Learn to Use Tech." *Education Week* 36 (35): 5–11. www.edweek.org/ew/articles/2017/06/14/poorstudents-face-digital-divide-i....html?r=1189046393.

Heft, T.M., & S. Swaminathan. 2002. "The Effects of Computers on the Social Behavior of Preschoolers." *Journal of Research in Childhood Education* 16 (2): 162–74.

NAEYC (National Association for the Education of Young children) & Fred Rogers Center for Early Learning and Children's Media. 2012. "Technology and Interactive Media as Tools in Early Childhood Programs Serving Children from Birth through Age 8." Position statement. Washington, DC: NAEYC. www.naeyc.org/files/naeyc/file/positions/PS_technology_WEB2.pdf.

Plowman, L., & J. McPake. 2012. "Seven Myths about Young Children and Technology." *Childhood Education* 89 (1): 27–33.

Wang, X.C., & C.C. Ching. 2003. "Social Construction of Computer Experience in a First-Grade Classroom: Social Processes and Mediating Artifacts." *Early Education and Development* 14 (3): 335–61.

Photographs: pp. 21, 22, courtesy of the author; p. 24, © iStock

Copyright © 2017 by the National Association for the Education of Young Children. See Permissions and Reprints online at www.naeyc.org/yc/permissions

Audience: *Teacher*

Age: *Kindergarten, Preschool*

Topics: *Other Topics, Technology and Media, Digital Media*

HOLLY CARRELL MOORE

Holly Carrell Moore, PhD, is an educational technologist for Eanes ISD, in Austin, Texas. Holly supports teachers integrating developmentally appropriate technology in classroom curriculum and conducts research on multiple aspects of children's play and learning. hollycmoore@utexas.edu

Young Children

November 2017

Vol. 72, No. 5

Buy this issue

Subscribe

Become a Member

Support our efforts to secure a bright future for young children, educators, and families.

Join or Renew

Support NAEYC

Donate to help NAEYC advance a strong and dynamic early childhood profession and connect educators to cutting-edge resources.

Make a Donation

Find Your Affiliate

Connect with professionals in your community at conferences, networking events, advocacy efforts, leadership opportunities and more!

Get updates from NAEYC

Sign up

© National Association for the Education of Young Children
1313 L St. NW, Suite 500, Washington, D.C. 20005 | (202)232-8777 | (800)424-2460 |
help@naeyc.org