voices of PRACTITIONERS

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Investigating the Role of Interactive Technology in a Connecticut First Grade Classroom

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Digital technology is a signature of our times, yet questions remain about how early childhood educators should best engage young children with related tools. Primary grade teacher Charity-Ann Baker addresses these questions with her first graders. Her study demonstrates how children's learning can be supported through interactive technology such as a SMART board, document camera, computer software, and the Internet. Charity-Ann collected a wide range of data, including qualitative and quantitative sources. Her findings demonstrate children's increased academic and social-emotional capacity, applying to higher-order thinking, technical skills, confidence, and more. For example, she describes how the technology provided more opportunities for children to collaborate. This timely piece of research extends our understanding of how primary grade children can effectively use a range of digital technology tools, and opens up a frame of study for other teacher researchers to examine similar questions with even younger children.

—Barbara Henderson

Photographs courtesy of the author.

In my experiences working with kindergarten through third grade children, I've consistently observed their great interest in using our classroom technology. In my classroom, use of such technologies seemed to correspond with an improvement in their academic and social-emotional progress. I found that while many parents and teachers support the use of technology in the classroom, quite a few also feel strongly that technology use is not appropriate for young children. Teachers have commented to me that "we will spend more time instructing children on *how* to use technological devices than actually using them" and "why spend time in a computer lab so children can type their stories when we can do the task much more quickly?" On learning about our new technology equipment parents voiced concerns such as "Will it eliminate the role of the teacher while the children are completing all their programs online?" and "I'm not comfortable with my child sitting in front of a screen to learn what they can get from a person."

I grew up in an age where technology was already prevalent in everyday life. Still, transferring the influx of technology into my classroom curriculum was something I needed to learn to navigate when I entered the teaching profession. There were so many more technological options for my classroom than when I was a student myself, and I was eager to learn more about its effective use and potential benefits for children.

Unfortunately, it is true that many teachers do not know how to use technology effectively to forward their learning goals for children, and conflicting opinions remain on the topic. I felt that the actual process in my classroom counteracted the negative criticism, and wanted to more closely explore and document how my first graders responded to the interactive technology, tools, and software in my classroom. Focusing on its impact on my own first graders, I sought to tackle the following questions:

- When used effectively, how do interactive technologies—including SMART Boards, document cameras, computers, and select software resources—impact the young learners in my classroom?
- Are these technological tools developmentally appropriate for my early childhood students?

Literature review

Technology use is often dismissed as children sitting passively before screens by those arguing that it is not developmentally appropriate for young children, who are notably active learners. But as the position statement from NAEYC and the Fred Rogers Center emphasizes, "All screens are not created equal" (2012). We cannot assign television to the same category as a SMART Board, document camera, or computer as a tool in the classroom. This new set of digital tools is called *interactive technology*, defined as

the use of any technological hardware device or software that young children actively participate in through voice, sound, touch, or other means of sensory involvement. Puerling's work *Teaching in the Digital Age* (2012) was critical in shifting my mindset from classroom technology use in general to focusing on interactive technology's impact on young learners. He suggests that these new technologies can enhance the way both teachers and children gather, share, analyze, and apply information.

Most four- through eight-year-olds are exposed to or interact with multiple forms of media and devices on a daily basis. Early childhood educators have the opportunity to take that foundational exposure and use it to capitalize on children's strengths and improve weaknesses in a variety of cross-curricular and cross-modality areas (NAEYC & Fred Rogers Center 2012; Puerling 2012). To effectively employ new technologies as classroom tools and resources, teachers must stay current with technological standards and incorporate them into daily planning, instruction, and assessment. One such standard is the joint position statement issued by NAEYC and the Fred Rogers Center for Early Learning and Children's Media on technology and interactive media, which affirms the potential benefits of technology for young children when integrated into developmentally appropriate practice:

> When the integration of technology and interactive media in early childhood programs is built upon solid developmental foundations, and early childhood professionals are aware of both the challenges and the opportunities, educators are positioned to improve program quality by intentionally leveraging the potential of technology and media for the benefit of every child. (NAEYC & Fred Rogers Center 2012)

Developmentally appropriate use of interactive media offers children access to a greater breadth and depth of learning. Too often a child's cognitive capacity is seen solely in the ability to master specific skills, such as counting, identifying shapes, and matching appropriate letters and sounds (Wright and Shade 1994). However,

> Cognitive development is much broader than this. It involves making sense out of the world, exploring objects and materials to understand their properties, discovering the interaction between things, seeing the predictability of cause-and-effect relationships, generating and solving problems, and drawing conclusions—whether correctly or incorrectly—about how things happen and why. (Wright & Shade 1994, 85)

Interactive technology can offer the support and opportunities for children to develop skill in using these critical cognitive strategies.

Another oft-heard critique of technology is that it isolates children from one another. Peer interactions were also important to my research—children interacting and learning through observation and imitation of one another, with more advanced peers serving as experts for others.

When technology is used in collaborative, constructivist arrangements where the teacher is not the sole source of information, children develop

skills both independently and with peers. As Montessori believed, "[T]he more we manage for children, the harder our jobs will be" (Mooney 2000, 29). I believe in constructivism and drew from Vygotsky's developmental theories on learning to frame my own and the children's interactions with each other as they used the technology (Vygotsky 1978). According to Vygotsky, learning occurs in collaborative social interactions (Smidt 2009). He states that learning occurs in a zone of proximal development; if a child cannot yet accomplish a task alone, she may be able to accomplish it with the help of an adult or a peer who has already mastered the task.

Methodology/Research Design

My research was conducted over the course of four months, from September 6th to January 9th. The 18 first grade children involved were from a variety of academic, linguistic, cultural, and socioeconomic backgrounds. They also included children with learning disabilities, language acquisition difficulties/delays, and who were from culturally underrepresented groups. At the start of the school year, I implemented a variety of new interactive technological and digital resources into planning and instruction. Hardware devices included a SMART Board, a document camera, and six classroom computers. Software resources included educational websites such as Raz-Kids (an online guided reading program with interactive and downloadable e-books), Starfall (phonics instruction incorporated into games and interactive e-books), and The National Library of Virtual Manipulatives (a digital library containing interactive, web-based mathematics activities for K–12), as well as word processing (Microsoft Word) and presentation programs (Microsoft PowerPoint, Prezi, and iMovie).

I collected data through:

1 observation of children's engagement and attitudes,

2 interviews of the children,

3 a happy/sad faces assessment of feelings about technology

4 parent surveys, and

5 investigation of children's academic progress through both online and "traditional" assessment measures.

Observation of engagement and attitudes

I placed the children randomly in groups of six and assigned them tasks to complete independently at a computer. I kept tallies to note indications of disengagement (e.g., looking around the room) and appeals for adult help after my initial instructions and discussion. I kept anecdotal records on

collaborative conversations amongst children during group work with the technology. This data helped me gauge children's confidence levels navigating various websites independently and to get a clearer picture of their active interest.

Interactive interviews

Interactive technology use is personal, and I wanted to learn about the children's experiences not only through my observations, but by asking them to communicate their feelings in their own words. Once a week I interviewed the children during our weekly one-on-one conferences. The interviews took place during both morning and afternoon sessions.

Some sample questions included:

- What is your favorite piece of technology in your classroom? Why?
- Who is the "leader" when you and your classmates work with technology?
- Are you good at using the technology in the classroom?
- Do you ever talk to your family members or friends about the technology in our classroom? Why or why not?

Later, I coded and analyzed the responses to uncover positive and/or negative trends.

A happy/sad faces assessment of feelings about technology

Students were asked to respond to the prompt "How does working with technology make you feel? Circle the face and words that show your feelings."

Parent surveys

In order to understand how parents perceived children's use of technology in school and at home, I distributed a survey once a month to the parents or guardians of each child. They were given the option of completing the survey on paper or accessing it online. There were five questions geared toward parental perceptions of their child's proficiency, and attitudes regarding technology based on home conversations. These questions included:

- How frequently does your child talk to you about the technology used in class?
- Do his or her reactions seem positive or negative to you?
- Explain what you think makes you feel he or she has a negative or positive attitude regarding technology.
- What particular programs, if any, have come up in conversation at home? Mark all [from a list of programs] that apply.
- What type of technology, if any, do you have at home that your son or daughter may be exposed to?

Academic investigations

I felt it was important to collect data that could shed light on whether the skills and understandings the students constructed in the online programs might contribute to their performance in offline class work. I compared the children's performance on specific skills in the online literacy and math programs with the formal assessments of these skills. The assessments included monthly topic tests from the Growing with Mathematics Program, the Developmental Reading Assessment (DRA2), a Phonological Awareness Assessment, a high-frequency word assessment, and a Words Their Way spelling inventory. For instance, if a child moved forward in an online reading program, did she progress on formal assessments as well? Did children's success in the online programs relate to improved decoding accuracy, fluency, comprehension, number sense, and probability mastery in daily lessons? I analyzed my data by noting whether there was an alignment between on- and off-line tasks of mastery in these areas, coding positive versus negative trends.

Findings and discussion

The interactive technology enriched the children's academic learning experiences and their peer interactions. It contributed to their cognitive and social competence in ways that were developmentally appropriate for young learners. In my research, six major findings surfaced:

- children took on cognitive challenges and applied online learning to off-line tasks and vice versa, integrating the two;
- children gained confidence in their use of technology, which fostered higher levels of self-esteem and independence, prompting more active roles in their learning and ownership over their work;
- children's oral and written communication skills improved;
- the traditional roles of teacher/child were altered;
- children engaged in more collaborative interactions with each other; and
- children became more apt to communicate about their learning outside of school

Children took on cognitive challenges and applied online learning to off-line tasks and vice versa, integrating the two

The software and online programs used provided children with a variety of tools to explore ideas rather than offering a fixed set of options. These tools were designed to foster children's problem solving and critical thinking, such as discovering the interaction between things or seeing the predictability of cause-and-effect relationships (Wright & Shade 1994). The children willingly took on these challenges, which required them to find solutions to

content problems as well as to technical issues. Multimedia programs like Raz-Kids, Starfall, and RoytheZebra worked within children's zone of proximal development to help them move at their own pace and ability while at the same time providing challenge. Raz-Kids, specifically, supported their efforts by allowing the children to set higher-order tasks as long-term goals, all the while motivating them to learn the lower-level skills needed to get there. For example, when they mastered the decoding accuracy and fluency of the last text in the group of level 6 books, they would be given a set of comprehension questions. Mastering that comprehension would move them along to a text that aligned with DRA level 8, and then they could complete that set of texts as well. Since every level is viewable to children in Raz-Kids' online "bookrooms," for example, children have something to look forward to achieving, although they can only access the level that is "just right" for them at that time. The children accessed such programs independently on the classroom computers, or on the SMART Board for a whole-group activity.

The children applied the strategies they learned through their use of the interactive technology to their work off-line in the same subject area. They recognized these patterns as well. When asked about how technology helps him with his favorite subject, a child explained:

> You teach [learn] how to read [better] because I see the words on the SMART Board from the document camera (*points to those tools in the classroom*), and then the same words in my book and they're snap [sight] words because I've seen them before!

As highlighted in this anecdote, the use of technology seemed to increase the children's ability to self-monitor for problem-solving. Children recognized they were confused or needed to make changes, especially when they came to reading tricky words in online passages. This child was clearly self-monitoring his reading, and his ability to recognize familiar print with ease fostered more fluent reading overall. When asked about which technology is most helpful, children identified their ability to read books on the computer, watch strategies modeled on the document camera, and type their own stories.

The children not only used the technology tools to supplement their traditional forms of learning, but incorporated their off-line learning strategies into their work in the same subject areas online as it became woven into our everyday curriculum. For example, in the bookrooms in Raz-Kids children used their repertoire of decoding and comprehension strategies learned in class to accurately decode and comprehend (in both literal and evaluative ways) what the various fiction and nonfiction texts presented.

Through my academic assessments, I found a close alignment between the areas that were most covered in the online literacy and math programs and the areas of most academic improvement as measured by the formal

assessment tools that were identified previously. This suggested that the children were applying their online learning, and a beneficial relationship between online and offline learning. For example, children whose decoding and comprehension skills increased on Raz-Kids reflected a similar improvement on the following Developmental Reading Assessment. Similarly, successful completion of various lessons retrieved from The National Library of Virtual Manipulatives website (which focused on number concepts, operations of addition and subtraction, patterning, and measurement of time, length, and money) illustrated dramatic increases in those areas on formal assessments.

Children gained confidence in their use of technology, which fostered higher levels of self-esteem and independence, prompting more active roles in their learning and ownership over their work

Children were naturally motivated by the interactive aspect of technology in the classroom. As they used it more frequently, they became more familiar with it. Ultimately, familiarity bred confidence, and confidence created a catalyst for independence. This in turn led to more active roles in their learning and ownership over their work.

The children enjoyed the technology sessions and became more confident using classroom computers—and more confident in technology use overall. When asked at the end of session 14, "Are you good at using technology?" all 18 students answered yes. The children explained that they knew a lot about technology for various reasons. For example, in my observational records I noted a particular child said,

> When you try, you realize you know how to do something.

As illustrated by the above, the children were beginning to take risks as their confidence with classroom technology grew—they were able to discover their strengths at a personally relevant pace. Many even went on to describe how they used it at home and helped their parents as well.

As I observed, children's appeals for help from me were dramatically reduced throughout the study. By the final sessions, each child sustained attention and was able to navigate sites independently. When the children initiated and directed their own computer use, they felt they were being allowed to use a "grown-up" machine. As Montessori stated, "Children have a passionate interest in real work" (Mooney 2000, 29). As they saw technology valued by adults in their world, they felt more powerful and valued. As noted by the US Department of Education,

> Both the increased competence [students] feel after mastering technology-based tasks and their awareness of the value placed upon technology within our culture, led to increases in students' (and often teachers') sense of self-worth. (2010)

Greater legibility of typed pieces encouraged children to publically display their efforts, which provided more frequent opportunities for positive feedback.

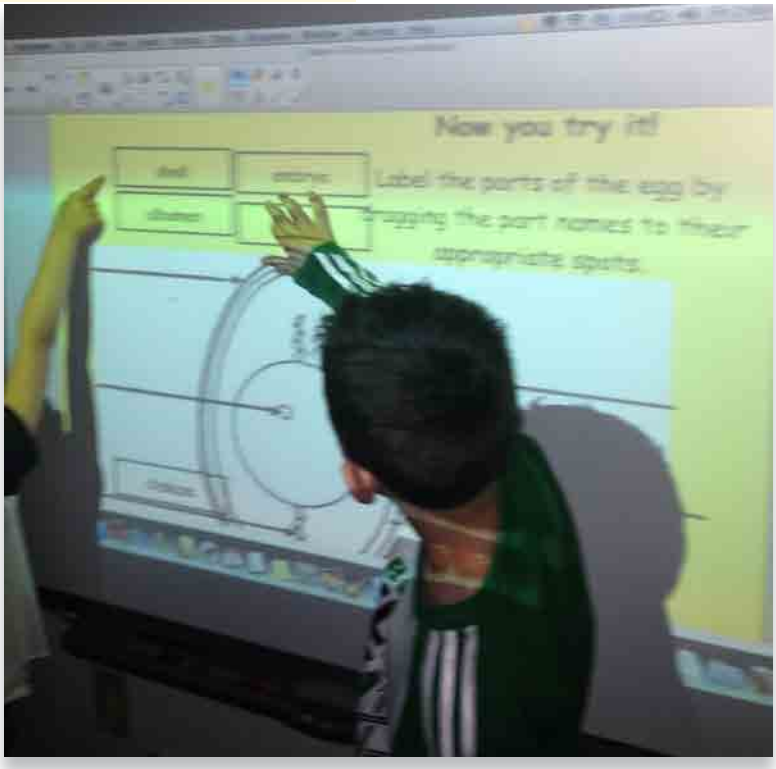
The interactive technology actively engaged the students, and their drive to participate meant they remained on task. All of the students responded "happy" or "very happy" in their ratings of technology use in the classroom. Only one child responded that he was "very sad" about working with technology in the first week of research. He went on to explain,

> Technology turns your brain to mush.

This was a view his mother had shared with him, specifically referring to television use. Yet, marked changes took place in this child over the course of the study. By the third week he began responding that he was "very happy" and eventually became excited to use the technology; he asked to use it often and laughed aloud when reading online literature. He began responding that he was "very happy" shortly after his initial reaction. He said that he didn't realize technology was all the "stuff" around him in school—he had just thought technology meant television.

He remarked,

> Technology is so much fun and it makes your brain bigger, too.



He explained that technology makes your brain bigger because you learn much more than you would without it. This example provides a good illustration of the emotional involvement of the children in the technology.

The children favored the active, participatory roles the interactive technology offered. When given the choice, children always chose to engage with interactive technology rather than watch brief educational videos covering the relevant concepts. It seemed they would much rather take a role and decide the next steps of an activity for themselves on a SMART Board than watch passively and have that decision made for them in a video. As they used the interactive technology the children were *experiencing*—actively participating in—their learning during every step of the study. For instance the SMART Board provided children with an opportunity to physically engage with concepts, for example by moving words around by touching the board. The children could model an activity for classmates

on the SMART Board via the document camera—for example zooming into a book, pointing to a specific spot in their writing, or working through a mathematics task. The classroom document camera also allowed me to represent ideas through real, three-dimensional pictures, graphs, and physical models that enhanced their experience and helped students better understand newly-presented information.

Children's oral and written communication skills improved

The interactive nature of the technology helped support children's development of communication skills. Fluency, expression, grammar, and both oral and written activities were impacted. For example, the children acted out a play using iMovie software to record their own voices during digital storytelling activities, which helped them play back their read-alouds. Digital storytelling is a brief, digital media production (like a skit) that allows children to share personal narratives; it can also include children reading a book aloud using a storyteller's voice (see this link for an example: **https://vimeo.com/95068047**). This process enabled them to more closely note the way they employed the appropriate rate (speed of talk), expression, volume, and tone to demonstrate a character's "storyteller voice." They distinguished changes in intonation between tag lines and dialogue, and so forth. A feature in Raz-Kids also enhanced oral communication skills by allowing children to use a Mac computer's built-in speaker to record their reading. It helped me assess their reading skills since I was able to play back the readings later when I had more time to listen to their reading fluency and expressiveness. Within the assessed passages, children demonstrated an increased number of self-corrections as well as general self-monitoring of rate, volume, and expression. This information was useful feedback for the children during my daily conferences with them.

In addition to oral language, interactive technology also seemed to positively impact the children's written skills. Children used the computer to help communicate their thoughts and ideas to tell their story in print. My journal records indicated that using word processing programs supported stronger, more clearly organized, and better-elaborated writing, while honing in on standard conventions of grammar and mechanics.

As my research proceeded, children were still required to complete written assignments in class using pencil-to-paper. During these instances, most children would skip words that were difficult to spell, ask the teacher to spell for them, or try to use easier synonyms (like choosing "bad" instead of "horrible"). This impeded the flow of their writing and their willingness to take academic risks.

Instead, when they wrote on the computer, they would recognize a word that was underlined in red and have to make decisions about the appropriateness of the word, as one child exclaimed:

I've got to figure out how to get rid of that red squiggly under my word—it's not spelled right!

This did not always mean that the children ultimately had papers that were free of spelling errors. However, the technology required that they sort through their resources to find the pertinent option because it would highlight spelling, mechanical, or grammatical errors that the children had to figure out how to fix independently.

Over time, revising their work for spelling errors transitioned to the children revising their work in general. Before long, the children were independently adding to and deleting words and sentences, and their pieces became more organized overall. With increased revision strategies, they began writing in a more focused way, targeting one particular topic or idea. This was a tremendous area of growth for students who previously wrote multiple, tangential ideas in a single piece at the start of my research.

At the Water Park

At the beginning of this study:

One day thor and I was at the water parck. And Ian. And Collin and max. We played. It's was fun. We got wet… And the normal park. .. And Jumpin Jammin to bowns.

After work using technology:

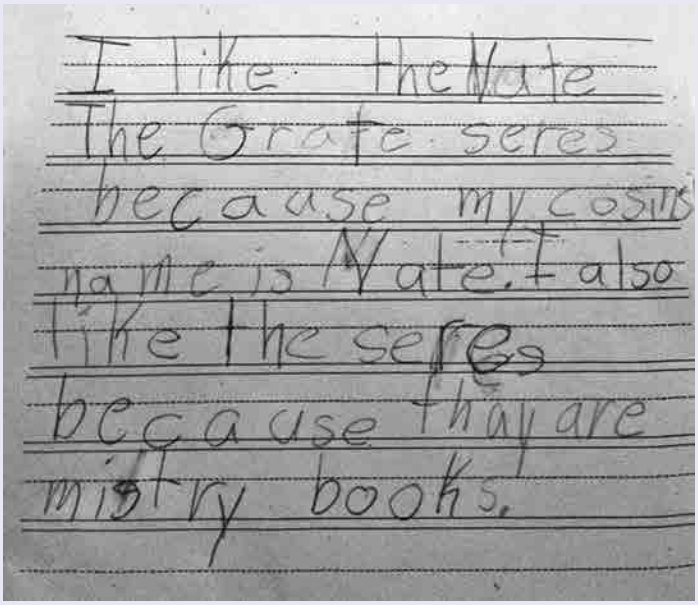
One day Thor, Ian, Collin, Max and I were at the water park. We played and it was fun. We got wet! We splashed each other! We like to play together at the water park. The water felt cold and we had bathing suits on. We will go to the water park again…

Michael becomes more focused as he writes about a "small moment" in a personal narrative.

It took children a bit more time to type rather than to write on paper because they were still familiarizing themselves with the keyboard. However, taking the extra class-time paid off—as the children's skills grew, they began to elaborate their ideas with more descriptive language, continuously adding details and integrating techniques from our Writing Workshop mini-lessons such as strong leads, and transition words. Children used the computer to help communicate their thoughts and ideas (see *Nate the Great* example).

Children were genuinely enjoying writing in a new way. They became more creative with the applications, excited to explore and create through words, photographs, clip art images, painting tools, and searches (see "Mealworm" example). They demonstrated high-levels of interest in "publishing" books by typing stories and made frequent comments about "being real authors" because their writing looked more professional when printed. For young learners, this change made all the difference to the feeling of ownership and accountability they had over their work, and ultimately resulted in more refined pieces of writing.

Molly recommends a book series.



I like the Nate The Grate seres because my cosins name is Nate. I also like the seres because thay are mistry books.

There are four reasons that I like the Nate the Great series. First I like the series because my cousin's name is Nate. I also like the series because they are mystery books and I like to read on to find out what is going to happen next. Then, I like Nate the Great because they are chapter books and have a lot of details. Finally, I like Nate the Great because the books have author's purpose. The books entertain a reader because they have details. I read six Nate the Great books and I like the series!

My Mealworm

My mealworm lives in wheat bran. It likes to stay on top of its apple. My mealworm likes to suck on its apple. My mealworm doesn't like to move. It is kind of lazy. My mealworm is in the larva stage and has a long body. The next stage is pupa and it will turn kind of white. It is almost a pupa. My mealworm has a life cycle. It will be a beetle last.

Max writes about his mealworm. This observation was part of a science unit on the life cycle.

As Puerling reports, when provided with opportunities to publish,

> Children will learn to respect the work of authors, illustrators, singers, artists, and researchers. When children have the opportunity to try on the roles and responsibilities of these jobs, they develop an understanding of their own work and intentions. (2012, 130)

I saw these effects firsthand in my classroom.

Traditional child and teacher roles were altered

I found that the interactive technology helped me focus more on placing the children at the center of attention. My findings concurred with the finding of the US Department of Education study that technology helps the teacher move away from the role of "the dispenser of information, but rather plays the role of facilitator" (US Dept. of Ed. 2010). I began to see this change in roles right away. Interactive, multimedia technology allowed me to shift my instructional techniques in order to differentiate material more concretely. Young students need a lot of one-on-one attention, and interactive software helps with that. The programs contained a nearly inexhaustible pool of resources for discovery and allowed children of completely different ability levels to work alongside one another on tasks targeting their unique strengths. For example, when children manipulate objects on the document camera or participate in an activity on the SMART Board, children actively determine their own actions. They don't depend solely on the teacher for help and information. I found that if I employed technology effectively as a supplement to instruction, I was better able to facilitate learning, monitor a greater number of children, and more likely to conference individually with each child.

As the children's independence levels increased, so did mine. I had a greater ability, over time, to set project goals for children to work on independently, and I could move from child to child to tackle specific questions or challenges. Specifically, during our balanced literacy block, my number of individual conferences increased from 7 students to all 18 students by week four of my study. I never got the impression that the children felt I was constantly looking over their shoulders—rather, they were excited to share the details of their progress with me when I came to them. One conversation took place as follows:

Charity: Take a look on the Bookmarks Tab for some kid-friendly sites to get started on your research about a frog's life cycle. I'll check back in with you a few minutes.

(*Four minutes pass.*)

Charity: How is it going with your frog research over here?

Child: It's great! You'll never believe what I found, Mrs. Baker! Did you know that there is a stage where the frogs are called "froglets" between the time they're tadpoles and frogs?

Charity: Isn't that interesting? Excellent research. Be sure you write down what body parts grow during the froglet stage on your research sheet, okay?

Child: Got it!

Acting as the facilitator gave the children the time and chance to share their learning and support and validation for their efforts.

Children engaged in more collaborative interactions with each other

I partnered and grouped students with different academic abilities together. In my observations, when partnerships or small groups completed a puzzle together, built with blocks, or played with toy cars, there tended to be one main "leader" of communication. The interactive technology I used invited children to share leadership roles. When children arrived at a computer or SMART Board together, they had to decide whose turn it is and resolve disagreements regarding the specific sequence of the activities amongst themselves. Once this process was learned (a significant social lesson in itself) I was able to guide the children towards finding partner solutions. Eventually, peer mentoring came into play and children excitedly became "teachers" for one another (Bruner et al. 1997). With some teacher guidance, the children gained new social skills as they eventually learned the difference between *completing* and *explaining* a program for an unsure peer. Children mentor each other in the following examples from my anecdotal records:

So, click there [pointing to the screen] and then see what happens.

Hey, I need a math mentor on this one. Can you help me?

When you get to a tricky word, you can click on it and it will tell you what it says. Here, watch me do it first, then you can try it. But you gotta make sure you have the headphones on to hear it, okay?

As students began to mentor each other they reinforced newly-learned concepts more equally. When I asked children, "Who is the 'leader' when you and your classmates work with technology?" a few children appointed leadership to themselves or someone else. ("Sometimes me or sometimes [name of partner]." "You, Mrs. Baker. Of course you are!")

However, 13 of the 18 students expressed a much more collaborative tone:

Both of us.

I don't know, there's not supposed to be a leader.

No one! 'Cause we're working together!

Even when each student had access to an individual computer in a laboratory setting, I noticed an increased frequency of student collaboration from the start of the study to its completion. In addition to our computers, the classroom document camera also sparked student collaboration. It allowed students to showcase demonstrations and model work for their peers on the SMART Board. After all, "large screens offer a way to invite an audience into what is occurring on and in front of the screen" (Puerling 2012, 74).

When I asked the children how it felt to work with a partner, everyone responded positively (e.g., "Excited," "Super," "Fun! Really, really fun!"). They explained that they liked the experience because they could help one another. What makes employing interactive technology so unique from any other child-centered classroom activity I've experienced is the symbiotic relationship of peers; there were consistently mutual benefits amongst the partnerships.

Children became more apt to communicate about their learning outside of school

Children's interest in multimedia technology didn't stop at the end of the school day, but actually promoted educational conversation outside of school. Children not only talked more about technology as they became more familiar with it, but also shared more information about what the technology was helping them learn. As one parent shared in a weekly survey,

> I noticed that [my child's] work with the classroom technology has definitely increased 'computer-talk' between her and my husband. It also has made her share more [about school] during general 'school conversation' too.

The parent explained that her child had visited a virtual museum on the SMART Board that day in class and voluntarily described her findings to family at home.

This example also became an opportunity to help the parents understand the benefits of technology to the child's learning. As Puerling states,

> Families want to support their children and often rely on teachers for insight on how to do this. . . . When you are confident in your practice and can clearly articulate how technology supports their children's growth and development, families are more likely to develop comfort and support for the technology's presence in the classroom. (2012, 212)

The parent surveys invited families into the conversation about our classroom technology, and presented very positive feedback. The result was cyclical—when parents felt "in the loop," children seemed more enthusiastic to converse with them. When the children talked about technology use more frequently and with greater enthusiasm, families seemed to become more comfortable with children using it in the classroom. As parents reported, by the fourth and final month of the study, 16 of my 18 students had discussed our classroom technology at home at least once a day.

Conclusion

Interactive technology can make a valuable contribution to young children's success as students and lifelong learners. As I found in my study, technical ability, confidence, and independence improves with use over time and

increases children's chances for lifelong learning. Technology changes quickly; therefore, the specific software and even hardware tools children are using now will certainly have changed by the time they are entering the workforce. However, as digital natives (Prensky 2001) the children acquired a basic understanding of how various technology behaves and the technological confidence to apply to future technological demands (US Dept. of Ed. 2010).

My research highlights how interactive multimedia (specifically, SMART Boards, document cameras, and classroom computers) can be developmentally appropriate for young children, leading to greater collaboration and more participatory, active learning. I found that interactive technology contributed to improved literacy skills in reading and writing, which are especially critical in primary classrooms. Integration of technology, offered as a supplemental tool in the early childhood classroom, does not distance the teacher from instruction. As my research shows, it actually gave me more time for individual conferencing with children, moving them to a central place of focus in the classroom as constructors and owners of knowledge. I also found that rather than socially isolating children, its use fostered more collaborative interactions with peers and enhanced parent understanding of children's learning at school.

The journey of my research was fruitful, and I look forward to sharing my findings with other educators dedicated to improving and enhancing the daily learning experiences of the children in their care. Once the surveys and interviews were completed, the data coded and analyzed, and the research submitted, one main point of reflection remained: When, and only when, children are given opportunities to fully understand the potential of interactive technology and its use in the classroom, can teachers, parents, and children work in tandem to reap the benefits of its implementation. Going forward, new questions emerge: how do we continue this conversation amongst educators? How do we provide opportunities for teachers and parents to learn more about interactive technology, and how it can be effectively used in the classroom to support and supplement the curriculum in a fully-integrated, not "stand alone" manner? In other words, how do we extend this conversation to allow teachers and parents to feel comfortable taking risks and learning more about interactive technology as they go? This is an area that has barely entered its maturity and can blossom into something truly meaningful for planning, instruction, assessment, and most importantly, for our children.

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