Using Touch Technology to Foster Storytelling in the Preschool Classroom

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This practitioner research explores ways children engage in literacy learning through storytelling with the use of touch technology in a VPK (Voluntary Pre-Kindergarten) classroom. With access to diverse touch technology devices but no experience using these technologies, a VPK teacher explored strategies to use the resources to enhance literacy learning in the classroom with the support of a professional learning community (PLC). The PLC consisted of a master's student, university faculty, school director, and a technology liaison. The implementation of this study took place over three weeks, and every week children created a different story. Collected data include photographs, student voice recordings, anecdotal notes, and a reflective journal. The three weeks of implementation data showed how touch technology provided a new modality of learning representation for young children in my classroom. The findings suggest that multiliteracies complemented traditional literacy, storytelling enhanced children's communication, and touch technology functionality went beyond literacy skills.

Introduction and Background Information

Practitioner research is a way for teachers to expand their knowledge and improve practices. Through this form of inquiry, early childhood educators are able to assert professional autonomy (Cochran-Smith & Lytle, 2009). Practitioner research draws from a rich tradition of qualitative research that views knowledge as personal and contextual. Professional knowledge in particular is an embodied knowledge, constructed within interactions within social contexts. Therefore, understanding practice is contingent on experiencing the practice itself. "Teachers who become teacher researchers are no longer passive recipients or consumers of other people's research but active agents in creating professional knowledge" (Castle, 2013, p. 270). This type of research is transformative in that teachers can change their practice based on their findings (Castle, 2006; Souto-Manning, 2012).

This study took place at the USF Preschool for Creative Learning (PCL), a teacher educator lab school that is part of the University of South Florida College of Education. The PCL takes an inquiry approach to teaching and learning. Teachers are viewed as curricular decision-makers who conduct teacher research in order to better understand the children they teach,

innovate practices, and to inform the field of Early Childhood Education. The teacher featured in this study was new to the PCL and enrolled in the master's program in Early Childhood Education; these two contexts intentionally aligned to support her study.

The study was collaborative in nature with the director of the school, early childhood faculty, and a technology liaison supporting a new teacher engaging in research. While the structure and philosophy of the preschool provided the necessary support to conduct the inquiry, we consciously strive to cultivate a culture of inquiry at the school by encouraging exploration and innovation. For example, we provided opportunities for the teacher to play with the technology and connect with a graduate student whose work focuses on digital literacies to provide job embedded professional learning and ongoing support in terms of the meaningful incorporation of technology. We also provided space and time for the teacher and her students to try the technology. In this way, professional learning was embedded, authentic, collaborative, and responsive to the teachers' own questions rather than "top-down." Coursework from the masters program provided a foundation in inquiry and facilitated a connection between theory and practice.

In this paper we will describe a new teachers inquiry that was supported through multiple levels of collaboration with a director, early childhood faculty, and a technology liaison. The teacher shares a narrative of her process and findings in this inquiry. We explore not only the inquiry itself but how this type of research is supported at multiple levels. Although there is ample research on the importance of teacher inquiry, little is discussed on the importance of support and how it is enacted in the field.

Literature Review

Inquiry

Practitioner research has many meanings. However, for the purpose of this research we consider practitioner research to be the study of teaching for the improvement of teaching and learning through the notion of inquiry (Lankshear & Knobel, 2004). The idea of practitioner research is grounded in the belief that teachers are learners, critical thinkers, and active agents (Hicks & Sailors, 2018). Through the process, teachers engage in pedagogical reflection where they come to a deeper understanding about themselves as teachers and therefore their own students (Castle, 2006). This type of work creates an opportunity for teachers to look critically at

their own practice for the primary purpose of improving their classroom practice. Inquiry as required by this type of research identifies the paradigm shift of teachers as consumers to creators of knowledge. Inquiry therefore lends itself to be situated as a form of job embedded professional learning. Practitioner research within a professional learning community (PLC) provides a space for discourse and to create opportunities to reflect on ideas brought about through an inquiry (Cochran-Smith & Lytle, 2009; Damjanovic, 2015). Inquiry is one way to understand how teachers can best use technology to foster learning.

Technology in Early Childhood

Technology tools and digital spaces are widespread and growing. An increasing number of young children use digital devices outside of school settings. However, the use of technology in the early childhood setting has been a topic of debate among educators and parents as children's screen time increased. Previously, the American Academy of Pediatrics (AAP) recommended no passive screen time to children under the age of two and less than 30 minutes a day for children under the age of five (2016). After overwhelmingly positive research findings, the AAP changed their recommendations in 2016. The new recommendations state that children can and should engage in active screen time, but with high quality learning software and apps that interact with others.

As technology becomes more prevalent in our society this distinction between passive and active screen time has become increasingly important (Berson & Berson, 2010). Much of the research has indicated that active screen time can be beneficial for young children when used properly. According to Plowman and McPack (2013, p. 31), "Technologies can expand the range of opportunities for children to learn about the world around them, to develop their communicative abilities, and to learn to learn." There are a vast number of tools and online spaces with which children can engage; however, it is important to evaluate what types of technology are going to benefit children's growth. Developmentally appropriate uses of technology should provide opportunities for students to explore important literacy domains in preschool. "Preschoolers should focus in the following areas to produce meaningful outcomes in literacy: engaging in writing, alphabet knowledge, phonological awareness, oral language skills, concept about print, and more (Hall, Simpson, Guo, & Wang, 2015)."

Educators are responsible for the type of technologies they bring into the classroom and how those technologies are used for teaching and learning. Therefore, professional learning opportunities and support are necessary for proper diffusion and implementation. Proper support leads to teachers who are confident, competent, and motivated to use technology with students (Nordmark & Marcelo, 2014). Moreover, once teachers feel confident in implementing technology into their classroom, considerations of pedagogy, curricular integration, and developmentally appropriate practices should be considered (McManis & Gunnewig, 2012). As an example, evaluating the content of apps and software is an important consideration to properly support the quality of learning.

Technology to Support Literacy

Technology is a powerful medium to support and enhance children's literacy and language development. Some examples of tools found in the early childhood setting include touch tablets, online stories and e-books, interactive educational apps, video devices, and cameras, to name a few. With access to digital tools and teacher's adept at using technology for a purpose, children develop emerging knowledge of print, reading and writing, as well as opportunities to solve problems and socialize in the classroom (Beschorner & Hutchinson, 2013). Furthermore, it has great potential to foster literacy skills through multimodal storytelling when assisted by teacher's scaffolding and rich conversation (Rhoades, 2015). "Storytelling benefits development of oral language complexity and story comprehension in young children" (Isbell, Sobol, Lindauer, & Lowrance, 2004). An additional outcome of storytelling with digital tools is the potential for working collaboratively with their peers. According to Sylla (2013), "mutual awareness of children's interactions, control over interactions, availability of background, and shared cultural knowledge are important factors that shape cognitive processes and social interaction" (p. 651). The use of technology during storytelling may give students the chance to negotiate and problem solve with peers while creating the narratives. This paper explores the way a VPK teacher used touch technologies to enhance literacy through storytelling techniques.

A Teachers Technology Inquiry

As preschool professionals, we are continuously looking for different ways to promote learning opportunities for students that emphasize authentic experiences and real-world tools.

The same way that young children express their learning through multiple ways, teachers should teach through diverse methods. In search of innovative approaches to teach literacy, we had access to touch technology in the classrooms yet didn't capitalize on these technologies to teach. This realization led to a teacher-initiated inquiry to understand how these technology resources could enhance literacy learning in my classroom.

With access to touch technologies, we now needed the knowledge on how to integrate them into school practice. As stated in NAEYC (2017) and Fred Rogers Center (2012) best practice guidelines, technology can optimize learning opportunities and relationships among teachers and peers when used wisely. It is considered the educator's responsibility to make intentional and appropriate choices when implementing technology in the classroom. In this paper, we offer multiple perspectives from a teacher engaging in inquiry to improve practice and teacher educators who engaged in supporting the teacher in various capacities.

In this study, children in the classroom were involved in authentic hands on experiences where they investigated and questioned real-world topics. Children engaged in literacy lessons though reading, conversations, applying drawing and writing into their investigations and play. Technology was one instrument to promote rich literacy experiences. In order to keep pace with the spontaneity with which students learn, we used students' own stories to explore the integration of touch technology into their learning routines. Moreover, we decided to investigate the question: In what ways can we utilize touch technology to enhance literacy through storytelling? The following describes the teacher's process for exploring the wondering and her findings.

Methodology

Participants and Setting

This inquiry took place in a classroom at a teacher education lab preschool located at the University of South Florida. The school has a total of 5 classrooms. The lead teacher in each classroom has a minimum of a Master's degree in early childhood education. The vision and mission of the school revolves around inquiry based teaching and learning for the children, pre-service teachers, and teachers. The role as a teacher in this school is to provide exemplary based practices to young children, while engaging in their own inquiry. The classroom has a total of twenty-four students in a VPK (Voluntary Pre-Kindergarten) classroom who are 4- to 5-years-

old. These students learn through inquiry as they explore real world experiences, utilizing the framework of the Project Approach (Helm, Katz & Chard, 2014). To support students' engagement in authentic practices, this VPK classroom has a lead teacher, an assistant, and a pre-service teacher in her final internship.

Within the preschool setting, there are three types of touch technology available for children to use. An interactive Promethean board using software called ActivInspire that primarily supported children's writing and drawing. An interactive table using Story Maker software, which is similar to the ActivInspire but with a limited variety of tools. Lastly, we utilized tablets to take pictures and record videos.

In addition to creating a climate that supports inquiry, organizational structures were created to encourage and support PCL teacher research. First, time and space was created for teachers to engage in on-going dialogue about their practice. The structure of the inquiry meetings was inspired by Abramson's (2012) notion of co-inquiry. In this view, "teachers construct knowledge through inquiry with the assistance of colleagues and faculty, who help them refine and clarify their ideas about their learning and teaching experiences in the classroom. Teachers see classroom problems or questions as possibilities for learning and growth rather than as stressful and inhibiting" (p. 4). During these meeting times, teachers share classroom documentation, engage in dialogue, and consider actions to take.

Another structure developed to support teacher research was a PCL writing group, optional and open to all who are engaged in collaborative inquiry at the school. Castle & Dickey (2014) point out, "writing up" and publishing teacher research is not typically the teacher's first priority. Rather, their focus is on meaningful applications to their classroom teaching. Therefore, faculty assisted in the process of working toward publication as a collaborative effort.

Inquiry Plan

The teacher initiated her study as partial fulfillment of her degree coursework in our institution's Early Childhood Education Master's program. Our practitioner-oriented program is designed to advance the knowledge and skills of practicing teachers and focuses on teachers' experiences in school contexts as the basis for critical dialogue. The teacher completed a research seminar that helped her develop an inquiry stance. Throughout the course she designed and conducted her research study. The intent of the semester-long learning experience was to

engage Masters students in teacher research to inform instruction, enhance student learning, and empower them as leaders and advocates in the development and implementation of high quality and innovative early childhood practices.

Throughout the course, the teacher received scaffolded support as she began to examine her classroom life and related theories of teaching and learning. She first identified a topic of study based on observations of her own practice. She sought out and was provided with research that broadened her working knowledge of the empirical literature and engaged in weekly discussions with a faculty mentor and peers in the class on the application of findings to her own instruction. The teacher explored data collection approaches and created an audit trail of her findings. She participated in validation meetings with the class, presenting her data and initial analyses to test out her claims and make sure that her findings supported her assertions. Throughout this process the teacher became adept at taking critical stances on current issues in education and learned to defend her positions through well-articulated and substantiated arguments, relying on multiple forms of evidence to the extent possible. After these group sessions, the teacher drafted a write-up of each phase of her inquiry process and received ongoing feedback to guide your final representation of her work.

Purpose

The purpose of this study was to find different ways to use touch technologies to foster literacy through storytelling, to better determine the ways children used different devices in diverse ways. The implementation of this study was three weeks, every week children created a different story. At the end of the project children had completed three stories using different touch technology devices.

The first week of data collection took place following Spring break. The children were asked to create short stories about things they did during the week off from school. Children used the ActivInspire software on an interactive board to create these stories. With the use of this software children created drawings by selecting different sizes of pencils and highlighters in many different colors; wrote by typing or using the pencils; imported pictures and videos; and used different types of shapes as well as many other functions. While designing their stories, children were audio recorded for the purpose of documentation. They created individual short

stories that were put together at the end of the week. Children received scaffolded support from me and the other classroom teachers.

During the second week, children were given tablets to make videos and take pictures on the playground. This time the children created a short movie. Before recording the videos, I gave a brief explanation on how to record using this device. Some children used the tablet by themselves and explored the playground, showing their favorite things to do there. Others recorded the playground in pairs by narrating and asking questions to each other about what they do at the playground and what they would like to change or add there. All them had a chance to engage in this outside activity throughout the week.

On the last week of implementation, the children created memory drawings related to their current project topic. The interactive table was open for three days of the week during center investigation time. The children could come to do their memory drawing if they were interested in using the interactive table.

Analysis

Throughout the inquiry, a variety of data sources were collected. These sources included photographs, student voice recordings, anecdotal notes, and a reflective journal. The voice recordings were transcribed. The corresponding anecdotal notes were placed with the transcriptions. The photographs were put with the appropriate data record as well. This provided the teacher with a clear picture that included photo evidence, children's words, as well as teacher records. The researcher journal was revisited to link the data sources to her personal teacher reflections.

Qualitative analysis was new to this teacher. As the data was collected the director had initial conversations about her observations. Once all the data was collected, time was spent looking at the data together. From the beginning the student sought to automatically pick out themes that were preconceived by what she thought she should find. After looking through the data samples together, the director asked her to take a step back and to look line by line at her data. The data was then coded in order to identify emerging patterns. The codes were categorized in order to create overall themes. These themes were then analyzed to gain a deeper understanding of the research question posed by the student (Stake, 1995). The following is a narrative of her findings and is told from her voice and perspective.

Findings

Touch technology provided a new modality of learning representation for young children in the classroom. The findings suggest: (1) multiliteracies complemented traditional literacy strategies, (2) storytelling enhances children's communication, and (3) touch technology functionality goes beyond literacy skills.

Multiliteracies complement traditional literacy. The use of touch technology to enhance literacy through storytelling has deepened my understanding of multiliteracies and its advantages beyond traditional literacy. Traditional literacy is imperative for young children's learning and involves the abilities of demonstrating phonological awareness, knowledge of the alphabet, knowledge of print, comprehension and responses to text, and emergent writing skills. As Rhoades (year) stated, early childhood literacy curriculum stresses an approach to learning the alphabet, building vocabulary, and phonological awareness. While children were telling stories they surely demonstrated various literacy skills.

In figure 1, the student was creating a memory drawing of her potato garden during phase 1 of our playground and garden project using the interactive table.

Student: *"I have a potato garden at home! My dad made holes with a shovel and threw the potatoes. Clean potatoes. They grew under the ground."*

While labeling her drawing she said the word potato out loud and started to sound out the word *"/p/, /p/… First is a P. Potato… t. Potato… I hear an o." And she wrote PTO meaning potato. Then she started to write the second word. "The potato garden is in my backyard. I will write backyard. Back… letter B. Ba… /a/, it is A. Back… is it a C? Yard… /y/, /y/, /y/, it's like "yo-yo". And she wrote the letter Y. "Yard… R. Yard… D".*
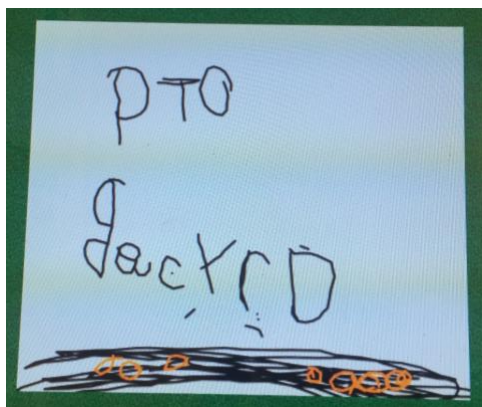
Figure 1: Potato Garden

According to Rhoades (2015), "a multiliteracies approach combines traditional alphanumeric literacy with flexible skills, knowledge, and practices applicable across disciplines, texts, medias, and contexts." Analyzing this work sample, the student demonstrated several literacy skills, such as fine motor abilities to write letters; alphabet knowledge, using letter-sound correspondence to create words; and emergent writing skills to convey meaning.

This next work sample is from another student who was also asked to do a memory drawing about gardens using the interactive table.

Student - *First, my garden is a square and has round things.*

Teacher – *What are these round things?*

Student – *They are for the seeds to grow. You cover with little soil.*

Teacher – *What else do you need for the seeds to grow?*

Student - *We put this many of cups of water (showing six fingers)*

Teacher – *How many are those?*

Student – *1,2,3,4,5,6.*

The student labeled his picture writing the letters "GDN" representing the word GARDEN. During the process of writing these letters he started sounding out the first letter: "Garden… /g/, /g/, /g/, this is the sound, but I don't know the letter. It's like Gabriel's name." (I wrote the letter on a piece of paper to demonstrate the letter.) While writing the curved line of the uppercase G he said: "Oh, it is almost like Carlos's name." (Then the student and I identified together the sounds of the letters D and N.)
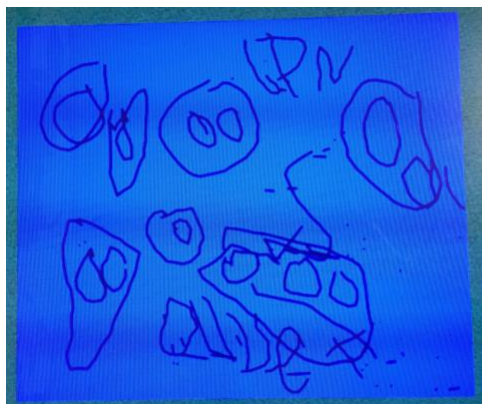
Figure 2: My Garden

By analyzing this work sample, we can see that there are other skills embedded in his work that go beyond traditional literacy skills. The student demonstrated mathematical skills when classifying geometric shapes, counting, and using one-to-one correspondence. The student also demonstrated science knowledge about planting a garden. The student applied his cognitive skills by making connections between letters and his peers' names. He also demonstrated language skills as he engaged in conversation. Ultimately, this student exhibited interdisciplinary skills while creating his memory drawing.

Storytelling enhances children's communication. Analysis of data shows that children were telling their own stories by giving specific information about their experiences. Students communicated their stories by drawing, taking pictures, and recording video. Regardless of the method students used to tell their stories, they were sharing experiences and communicating giving specific information. According to Nitecki and Chung (2013), "the focus in preschool should be the foundation exposure to readings, enjoying reading, refining fine motor skills for writing, and most importantly, connecting literacy concepts to the child's experiences to make them meaningful." In my classroom, the children's personal connections to learning were evident as students told stories based on their past experiences. The following drawing is from a student who went to Cocoa Beach during the spring break.

Figure 3 shows a student sharing his experiences during his day at the beach. He shares a great amount of detail while he works.

Figure 3: Touch Table

All comments below were made during the process of drawing.

S: Student T: Teacher

S – I got knocked over four times by the waves. Could you imagine me being knocked over by those waves?"

T – Did you really? It has happened to me as well.

S – There is the Rikki Tiki Tavern, which is a restaurant. And these are the stools.

S – There is an ice cream shop at the start of the peer and I got ice cream. I got chocolate with chocolate.

T – I have been to this ice cream shop before, and I had mango ice cream.

S – Yeah, I got chocolate with chocolate.

S – It is concrete and wood. It is a combination. (Talking about piles that hold the pier)

T – I really like how you are connecting these two materials, and I see that the concrete is always on the bottom and the wood on top.

S –These piles are very tall!

S – There were not palm trees, there were not trees at all. We had some shades from the umbrella. Everybody had umbrellas.

T – I see you are making patterns.

S – Patterns all the way down. Gray, brown, gray, brown…

S – The Cocoa Beach Pier is big, and I am drawing a gray line and then another brown.

S – The Rikki Tiki Tavern is made of wood.

T – Were you able to see the ocean from there?

S – Its view is indescribable. Me and My daddy were looking at the view. I was on top of the stool.

S – When I walk far away from it I cannot see the ice cream shop, it is very small (Walking 10 feet away from the board).

S – When I was on the beach I saw a cruise ship"

Figure 4 is the student's depiction of his trip to Cocoa Beach.

Figure 4: Cocoa Beach

It is important to notice that without this transcript it would not be possible to learn all about his visit to Cocoa Beach by only looking at his Cocoa Beach Pier drawing. This example shows how essential it is to listen to children when they tell a story because they communicate vital information about the most important events of their experiences.

The use of the interactive board was very important for this literacy rich experience to occur. This student spent forty-five minutes working on creating his drawing, and during this time I could observe that he was constantly moving. The interactive board is very large in comparison to a 5-year-old child, and so the student had to stand up high to reach the upper part of the screen, and get down to reach the bottom part. Thus, by the time he was done creating his story, he had moved left, right, backwards, forward, knelt down, and tiptoed. This touch technology let the student engage in a meaningful literacy practice while engaging in a physical activity.
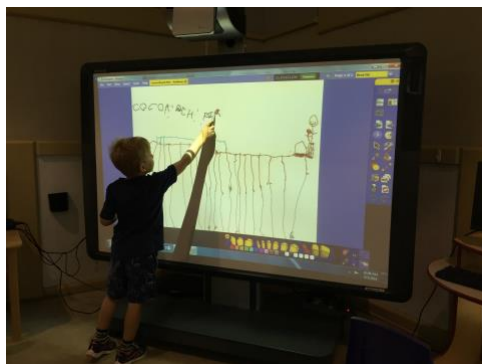
Figure 5: Interactive Board

Children interacted in rich conversation through the use of the tablet when sharing about their experiences at the playground. Students produced different types of videos about the playground. Many students simply held the tablet and walked around the playground by recording parts of the playground without saying a word. Other students paired up with peers, and each of them had a role; one was the cameraman and the other the speaker. Students communicated a lot when paired up with a peer because they were constantly asking questions and dialoguing. The dialogue below is between two girls showing Sara's favorite part of the playground.

Eleanor – Okay, talk about what you want on the playground. I won't want to do this. Sara, talk about what you want to the playground.

Sara – I want… the basketball hoop. Basketball hoop.

Eleanor – Say, a new basketball hoop.

Sara – New basketball hoop.

Eleanor – So, let's go… where is you place to go? We are going to that. You have to talk on the way.

Sara – I like this way. (walking towards the basketball hoop)

Eleanor – Where is your favorite place to go? I can't get you in the shot. Turn your head around. Let me see you.

Sara – (faces Eleanor) And I like and so do you. And I like how I can climb like this.

Eleanor – He like to climb the basketball hoop. (speaking louder and closer to the tablet)

Sara – Like that. (handing and touching her feet on the basketball hoop)

Eleanor – And do you have anything else to… Does she have anything else to say? (placing her mouth closer to the tablet again)

Sara – I like everything. (tying up a cord in the basketball hoop)

Eleanor – (talking in a low voice) Let me get you in the shot, move you from the pole… the pole is hard to see in the shot.

Sara – I… I… I… like…

Eleanor – Come one!!!!

Sara – To tie this on.

Eleanor – Oh!!!! She likes to tie that on. And then what do you like to do with it?

Sara – I like to do… pinch it.

This next example shows another interaction among peers to show how they use the slide. Jessica starts recording and begins to ask questions:

> Jessica – Marco how are you climbing this slide? (Marco climbed and slid the slide)
>
> Kelly – Jessica, take a picture of me. (Posing to the camera)
>
> Jessica – (Aims camera at Kelly) Kelly how do you get up the stair and down on the slide?
>
> Kelly – That is because my shoes are sticky.
>
> Jessica – Marco, how do you get up on the slide?
>
> Marco – I go like that. (climbing the slide)
>
> Jessica – No, not like that. You go up the stairs and down the slide. Monica, how do you do it? Monica, so how do you go up the slide and down the stairs?"
>
> Monica – You have to… (Starts going up the stairs and gets distracted by a peer)

Touch technology functionality goes beyond literacy skills. The use of touch technology gave students the opportunity to learn new skills. While using different devices such as the interactive Table, the interactive Board, and the tablet children discovered different ways to express and represent their learning. Each device had its own functionality, and students responded differently to each of these devices.

The interactive Board was the device students were most familiar with because I tend to use it more often to show videos, access the Internet, or show a presentation. In the preschool classroom, teachers usually set up the art center, choosing what materials are going to be used for a certain activity, the same is true for technology. The teacher makes the decision if students will use crayons, markers, or pencils. In contrast, I chose to use the ActivInspire software, and it encouraged children to make decisions about the size of the pen they want to use, if they wanted to use a marker or a highlighter, what colors they were going to choose throughout the drawing process, and what they were going to erase or keep while they created a picture. This software stimulates children to be decision makers about every detail in their work.

Figure 6: ActivInspire's Color Palette

Students also created drawings using the interactive Table, but on this device we used the Presentation Maker software. This software is a little bit different from the ActivInspire, but offers a similar process of allowing children to make choices about the tools they will use during the process of drawing and writing. However, the children were not able to change colors so easily. To change the background or the pencil's color, children had to keep touching the desired color 4 to 5 times until they touched the color they wanted. Children were getting frustrated when unable to choose the desired color. Here are some of their comments: "I cannot change the color", "Why is it not changing?", "No! I don't want blue, I want red!", "Ms. Ella, can you help me?" I thought that this software bug would discourage students finishing their drawings, but instead students demonstrated a positive approach to learning and persisted until being able to change to the color they wanted.

Figure 7: Changing Colors

I began to reflect about children's fine motor coordination as still emerging, which is an important skill for students to develop in order to write and draw. Robb and Lauricella (2014) observe that preschoolers struggle with their fine motor strength, and this skill is required to manipulate small objects and writing. Moreover, with more exposure to these touch technologies children can keep practicing their fine motor skills to improve their writing and drawing abilities.

Both the interactive table and interactive board were a highly desirable to the children in the classroom. Every time any of these touch devices were opened during center time students were willing to participate, and their engagement was very positive. This contrasted with the children's use of the traditional writing center with paper and pencil during center time. The biggest difference found was among the boys in my classroom who typically avoided the writing center, preferring the block center and/or manipulative center. But with these technological

devices, the boys were curious and engaged much more in drawing and writing than the traditional writing center in my classroom.

Conclusion

The teacher's inquiry in conjunction with our collaborative, multifaceted support system demonstrates the positive outcomes and the possibilities of the use of digital tools for teaching and learning in an early childhood context. The teacher's inquiry was transformative for other teachers at the PCL as well as for the children. As the teacher worked through successes, challenges, and barriers related to integrating the technology, she was modeling attitudes and dispositions necessary for using new tools and embracing a new way of thinking about literacies. She persevered when lessons and task didn't work or go as planned and she demonstrated curiosity and resourcefulness when presented with new ideas or approaches. All of this unfolded in a public, professional space, with peers and children observing and noting how she handled herself and new practices. Although enthusiasm and interest were sometimes diminished with concerns about time, change to classroom practices, and personal competence, ultimately, the teachers in the class became more comfortable with exploring multiple literacies with children utilizing technology. This resulted in the technology being available and utilized in the classroom by teachers and children on a regular basis. The teacher became the "expert" within the school for the technology used and provided support to teachers regularly.

The experience brought to light the principles of and need for embedded professional development and collaborative partnerships to support teachers, but also the inherent barriers that could prevent teachers from accessing and using digital tools. We learned the value of creating opportunities for teachers to engage in inquiry about their practice and we recognize the need to develop leadership capacities amongst our teachers. As teacher educators and coaches, we should ensure that: (a) teachers have time and space to play with and try-out innovations, (b) teachers have a support system and administrative buy-in, (c) professional development is job-embedded and on-going, (c) inquiry is a professional responsibility, and (d) we capitalize on and value teachers' expertise and knowledge.

We continue to reflect on how we can foster and develop agency in teachers as critical thinkers and how to develop dispositions towards innovation and change. We continue to explore integration of touch technology and content while maintaining effective pedagogies for early

childhood instruction. Additionally, we hope these practices resonate with other stakeholders within our program, such that technology related inquiry ripples across our community of practice in an effort to expand our understanding.

This study also highlights the tension between emphasis given to promoting traditional literacy and calls for teachers to "broaden" their conceptualization of early literacy. She found *multiple literacies* to be a lens that was most conducive for gaining understanding of classroom literacy events. Multiple literacies is a view that signifies a major transformation in the field of early literacy in terms of what is regarded as literacy. She generated data by observing children engaged in using touch technology to tell stories, audio-recording these events, and gathering samples of children's work. She showed the ways young children engaged in literacy practices using technology, illustrating how they incorporated traditional literacies but also pushed beyond as the digital storytelling manifested a rich and multi-layered communicative experience. Her interpretations challenge narrow views of literacy and deepen understandings of the ways in which touch technology can engage young learners. From this perspective, literacy is understood as a kind of social practice that a particular group of people value in a particular time and place (Wohlwend, 2008). It acknowledges that children develop both language knowledge and "social knowledge of how language is used in particular social situations" (Genishi & Dyson, 2009, p. 18) through visual, digital, graphic, and physical forms of making and perceiving meaning.

The findings presented in this inquiry demonstrate the ways children engaged in literacy learning with the use of touch technology. Prior to this action research, touch technology was not an option for students to engage in literacy learning due to the lack of my own confidence of implementing literacy in the classroom. However, the support of colleagues, the implementation of touch technology was possible, and the students engaged in literacy learning through storytelling.

Storytelling enhanced students' communication as they told stories with details that extended beyond the drawing and words written on their work. While creating their drawings, students were telling stories about their past experiences that were meaningful to them and engaging in literacy learning. The outcomes of children's works aligned with what Hall, Simpson, Guo, and Wang (2015) identified as important literacy skills for preschoolers: engaging in writing, alphabet knowledge, phonological awareness, oral language skills, concept about print, and more.

Children also engaged in multiliteracies with the use of touch technology through storytelling. Children embedded literacy skills across disciplines when creating stories with the different devices. The teacher's scaffolding and observation was vital for the purpose of capturing literacy skills through the children's stories. Anecdotal notes and voice recordings reflected the depth of the learning taking place. Students practiced fine motor strength and coordination while using the touch technology. Whether holding the pencil to write on the interactive board, changing color on the interactive table, or holding and aiming while recording with the tablets, children demonstrated enhanced precision in their fine motor skills.

This action research was an excellent way to start using technology in the classroom because these devices were well accepted by students. While working one-on-one with a student and using the touch technology, other students would always come to ask for a turn to use the device. Their interest for using these devices was so positive that it seemed essential to keep using technology in the classroom. According to McManis and Gunnewig (2012), the importance of incorporating technology in the classroom is growing, but unfortunately preschool teachers tend to be more hesitant to embrace technology in their classrooms compared to K-12 teachers. After this research, the teacher became more confident using touch technology in the classroom, and in turn, influenced other teachers in the preschool to do the same. Technology is another tool for children's learning.

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