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Integrating iPads in the Kindergarten Classroom: How Does Technology Engage Students in Learning?

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Abstract

This action research was conducted over the course of a semester with 22 kindergarteners at a public school in Lincoln, Nebraska. The researcher set out to find how technology engaged students in learning using iPads. The students were given a questionnaire to determine prior interactions with technology such as tablets, smartphones, computers or laptops. Majority of students viewed these devices for entertainment and pleasure. After integrating the use of iPads in the classroom for whole group instruction, during guided reading for small group instruction, and during choice time, the students viewed the devices as a learning tool as well as for gaming. Students were motivated by the iPads ability to offer choices that were appealing to student interests. The iPads engaged students by allowing them to be in charge of his or her own learning. The students learned problem-solving skills, built stamina and confidence working with the devices, and how to engage with technology to promote learning. Future work connected to this study includes integrating the use of iPads in mathematics and writing, and developing parent involvement.

Integrating IPADS in the Kindergarten Classroom:

How Does Technology Engage Students in Learning?

This research project started after taking iPads in the classroom taught by Dr. Guy Tranin at the University of Nebraska-Lincoln. I was very new to devices, iPads in particular, and wanted to learn more about integrating technology into my classroom. Upon completion of the course, I filed for a grant to receive three devices to use in the classroom; two iPad minis and a regular iPad. The grant was funded and by January 2015 I had three new devices to use. I was now set to integrate technology into the kindergarten class. What I didn't know was how. So I set off to begin discovering, how does technology promote student learning and engagement in the kindergarten classroom?

Background

This study was conducted at Miller Elementary School, an urban Title 1 school in Lincoln, Nebraska. The school is reported to have 66% minority students, 10% special education, 3% gifted and 35% English Language Learners (ELL). It should be noted that the percentage of ELL students reflects those students who have not yet passed the ELDA, which is the comprehensive exam given to students to test English proficiency in speaking, listening, writing, and reading. The number of ELL students who still receive support and services may actually be greater than 35%. The school has 19% mobility rate and 88% free and reduced lunch (Lincoln Public Schools profiles, 2013). The students at Miller Elementary School have access to technology daily with opportunities to utilize grade level

laptop carts, and a computer lab where students complete projects during a 50-minute period led by a certified computer teacher.

The implementation of the new technology was in a kindergarten classroom of 22 students; 10 girls and 12 boys. The classroom has one identified special educational student and three additional students going through the student assistance team (SAT) process. There are 10 ELL students with five of those students receiving pull out support.

Literature Review

Integrating technology into the elementary classroom has long been a focus in education**.** Most educators agree that computer access and literacy have become vital for young learners in the 21st century (Judge, Puckett, & Mee Bell, 2006). Miranda & Russell (2012) found eight variables effecting teacher-directed student use of technology. The study collected data from 81 schools in urban, suburban and rural districts in Massachusetts. One thousand twenty K-6th grade teachers were interviewed. The variables found were: obstacles integrating technology into lesson plans, teacher's experience with technology, perceived importance for computers for teaching, perceived pressure to use technology, beliefs about the breadth of technology benefits, and availability of and accountability to technology standards. They also found teacher attitude towards the use of technology and teacher experience with technology had the greatest relationship. Meaning, the more experience a teacher had with technology, and therefore an indirect measure of comfort level with technology, the greater perceived importance of using technology in the classroom. The study also found technology implementation was dependent upon the applicability to the classroom. If the users (teachers) did not feel the

technology was useful for the classroom, they were less likely to use it, regardless if the developers thought the applications were worthwhile for the classroom. This study also found obstacles with integrating technology into lesson planning appeared to have a negative effect on technology use in the classroom. Miranda and Russell (2012) reported, "teacher beliefs decrease as they experience problems integrating technology, and their confidence using technology also decreases. This combined effect may reduce frequency of use and experience with technology". So while the access to technology has increased dramatically over the past decade in school settings, factors related and directly tied to the teacher have a major influence on if those students have the ability to engage with that technology.

Although technology in the form of computers, laptops and access to the internet has increased, are available in schools, and teachers are providing students opportunities to engage with that technology, are students using it to promote learning? In an article published in *Information Technologies & International Development,* Fajebe, Best, & Smyth (2013) reported the One Laptop Per Child (OLPC) program empowered some of their students in a positive manner by making them more enabled learners. However, at the same time, it negatively affected students by emboldening some to become rude and disruptive in class. Teachers viewed the technology as a tool to support traditional modes of teaching and learning in the classroom, while some teachers viewed the technology as a burden to their pedagogy, listing lack of training and curriculum as big obstacles. So, how do teachers engage students in learning using technology without disrupting the workflow of others and discourage students from interacting with technology in a negative manner?

Shively (2014) conducted an exploratory study to examine how children engage with digital media using interest driven projects. Her work found children independently chose the level of involvement with the project by playing, working and learning simultaneously. Children (ages 7 and 8) were able to use problem-solving skills while interacting with digital media often switching from role of playful child to critical thinker. This suggests students who are engaged at their own independent level are most successful with the technology that is available. This also implies the teacher and classroom would need an environment conducive to differentiation that meets the needs of diverse students.

Furthermore, Delacruz (2014) found using the app, Nearpod, during guided reading with 4th graders did just that and was preferred by students versus a traditional text. Students reported enjoying the interactive capabilities of the app such as the drawing tool or quiz taking component. The study also found using Nearpod during guided reading could be implemented with about the same amount of planning and prep as traditional guided reading, with an added bonus of student engagement.

In addition to engaging students by interest and at his or her developmentally appropriate level, motivation is a critical factor in integrating technology into the elementary classroom. As Chien-Heng Lin (2011) found, increasing children's learning motivation is a significant part of effective learning. Lin suggested attracting children's learning interest and attention through stimulating the visual, auditory, and tactile senses. Using IPADS in the classroom offers a medium to motivate students using these senses as well as problem solving strategies and critical thinking all while engaging students in learning.

The purpose for the action research contained in this paper set out to find how the integration of technology in the kindergarten classroom engaged students in learning while adding to existing literature on technology in the early elementary classroom.

Methodology

Students were given a teacher made survey to gain information on students' background with technology in the form of computers, laptops, iPads or tablets. Students were asked for the main purposes of those devices, what they enjoyed doing on those devices, and if they had access to those devices outside of school. The results were analyzed to find common themes and help prepare the researcher for implementation of new devices in the classroom. The students and teacher developed rules and expectations regarding the new technology as well as a management system to ensure all students had equal time using the devices. The teacher used the iPads during whole group instruction, during small group guided reading, during independent work time, and during choice time. The teacher reflected upon implementation, identified challenges, and suggested further study topics.

Survey Results

I first needed to figure out how students had previously interacted with technology and devices. I knew around 40% of my classroom came from a Lincoln Public School preschool room, where the students had access to iPads on a daily basis. I also knew a few students had devices at home, such as a tablet or smartphone. What I did not know was how students would respond to seeing the iPads as a learning tool in the classroom, in

addition to the gaming functions so many students are familiar. Students were given the teacher created survey shown below.

Name_____

1. Do you know how to use a computer? Y N
2. Do you know how to use a mouse on computer? Y N
3. Do you know how to use a laptop? Y N
4. Do you know how to use a track pad on laptop? Y N
5. Do you know how to use an iPad or tablet? Y N
6. Do you know how to touch the screen on device? Y N
7. What do you do on the computer/laptop?
   _____
8. What do you do on the iPad or tablet?
   _____
9. Do you have one of these items at home? Y N
10. Do you get to use them at home? Y N
11. Do you get to use someone's smart phone at home? Y N
12. Do you know how to play games on one of these? Y N
13. Do you know how to learn to read on one of these? Y N

Notes:

After analyzing student survey results, it was clear most students knew how to use and felt comfortable using technology such as a computer, laptop, smart phone or tablet. Ninety-one percent of students reported knowing how to use a computer, with 86% knowing how to use a mouse. When asked if he/she knew how to use a laptop, initially 55% reported yes, with 41% knowing how to use a track pad. It appeared the language or vocabulary of 'computer' versus 'laptop' was confusing for students. At Miller Elementary there are only desktop computers in the library. The computer lab, carts, and teacher units are all laptops and this may have played a role in student schema when answering the question. When asked "do you know how to use a computer?" students confidently

responded “yes”, but when asked the follow up question “Do you know how to use a laptop?” Students were confused. Some said “no”, others asked “what’s a laptop?” After clarifying for students that the computers used in the classroom are called laptops, most students, 86% said “oh, then yes, I can do those.” Forty-five percent of students reported they did not have a computer or a laptop to use outside of school.

When asked if they had an iPad or tablet at home, 82% of the students responded yes. When asked the follow up question “What do you do on an iPad or tablet” 86% of students said “play games”. Students were then probed further for types of games they played. Most popular answers were Mindcraft, fruit ninja, candy crush, drawing games, puzzles, pet shop games where one takes care of a pet, racing games such as cars, motorcycles, skateboards, or a version of zombie killing. Two students reported using ABCmouse and a spelling, alphabet game.

Two themes emerged from the survey: students had background knowledge of technology, particularly with smart phones, tablets/iPads and laptops or computers, and they felt comfortable using those devices to play games. When asked, “do you know how to learn to read using the iPad/tablet or laptop?” only 50% of students said yes. One student stated “I have ABCmouse at my grandma’s house, but I can’t read on it.” Another student stated “I have a bookshelf app on my sister’s tablet, but the free books expired so I can’t read those anymore.” This information was helpful for action planning. I wanted to show students how to use technology not only for gaming pleasure, but also for gaming that supported the learning objectives from the classroom. I wanted to use technology to engage students in their learning.

Implementation

Teacher Preparation

Before students would have access to the devices, I needed to prepare each device with the apps and functionality I envisioned using in the classroom to engage students in learning. There were challenges to setting up the devices and the learning environment. I downloaded the apps I wanted to use in the classroom. I started with the *Wonders* curriculum app, which I was going to use heavily to begin with for leveled readers as well as the phonological awareness games. I also wanted to find more apps students could use during literacy time. I was particularly interested in *Reading Rainbow* and sight word or spelling word apps. As easy as it may sound when someone says "oh, that's easy, there's an app for that", when working with public school property, it was definitely not easy to just download the apps I wanted. After several frustrating, failed attempts at trying to download from the app store, I found out that despite having an apple ID to purchase, download, etc., from the app store, that does not carry over to Lincoln Public Schools owned devices. There was a protocol for getting an app put on a device that was owned by the district. Unbeknownst to me, or the executive secretary at the building level, there were several steps I needed to follow in order to get a single app downloaded to just one device, and there were three. I could not simply 'get an app' downloaded within minutes like a personal device. Nor could I just delete one that I didn't like. One of the biggest barriers so far was not being able to put the apps on the devices when I needed them. It was about two weeks time working with help desk and computing services at the district office to get everything where I needed.

The two-week time line brought up a second barrier-time. I quickly discovered that even if I followed the newly established protocol for wanting an app downloaded to the devices in my classroom, I still had no control over how quickly it got done. After filling out the necessary paperwork for each app for each device, the paperwork was sent to the district office where someone had to approve the app, then sent to someone who could push the app out over the server from the district office. If the app was not free, there was yet another department to approve it and determine if the correct funds had been used to purchase the app. Although from a district standpoint wanting to make sure the apps are approved and appropriate for students, ensuring one has paid for the app, and then making sure it actually gets loaded onto the correct device. From the user perspective, it is a long and tiring waiting game. What if my papers go to the bottom of everyone's list? How long would I be waiting? Is it not simpler to have the teacher be in charge of the devices? Nevertheless, I finally was able to have all three devices loaded with the apps I wanted to start. By the end of the semester, technical support from the district was able to find a faster route for loading apps which required filling out a help desk ticket, listing the device numbers and the desired apps. This was much faster than the process that occurred at the onset of this project.

The next step was planning the classroom management of the devices. One area I spent a lot of time thinking about was management of devices and use. There were several logistical aspects I needed to consider when implementing new devices into the classroom. Given I had three devices and 22 students, what was going to be the most fair way to allow students access, and provide multiple opportunities throughout the day to utilize the

technology? I needed a management system to establish a routine. I also needed boundaries around the use of devices so that students would be successful.

I decided that the iPads would be used during large group instruction with some student interaction but the majority of student driven use would come during guided reading, independent work time and choice time. The majority of time students would be working with a partner on the devices, but there would be opportunity for individual use sporadically throughout the week.

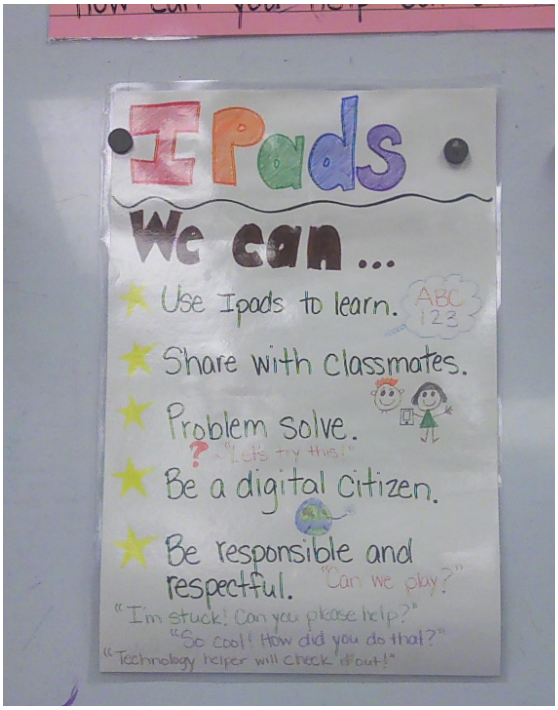
The routine for using the iPads during guided reading did not pose much issue. Each student had a partner and each pair had a device to manipulate. In the event a student was gone, the other partner was able to use the device solo. Guided reading groups ranged from one-on-one to a group of six students. Potential for kindergarten disagreement during guided reading was minimal. However, having the iPads as a center in the classroom for student use during choice time had a greater potential for problems. The routine already established for choice time options was to allow four students at each center. I anticipated a potential problem of how students picked his or her choice time option for the day once the iPads became a choice. In the past, I let students pick any center they wanted until the max of four was reached then that center was closed for the day. The next day usually students picked a different center and life was good. Very rarely were there arguments of "they played there yesterday and I want a turn" or "so-and-so always picks that center and now I can't pick that one". But I feared if there wasn't a rotational system of turn taking

Daily Job chart

attached to the iPads center, some students might never get there fast enough to have a turn. I decided the first four job helpers of the day would get to choose the iPad center first. If the student said no thank you to the center, the turn would go to the next student in line order. This way, all students knew they would have a turn to choose the iPad for choice time, and they would know when his or her turn would occur because of the rotation of the helping hands chart going in line order.

Along with this new center, a new job of Tech Specialist, was also created. The intended purpose of this classroom job was to assign one student each day to be the technology helper. This student was responsible for making sure the iPads were charged and ready to go for the day as well as shutting down and plugging the devices in at night. This job helper also was the first go-to person for help if students needed assistance and I was not available to help.

Tech Specialist Job



I also needed an anchor chart, or poster, setting the boundaries and expectations for using the iPads. I created a poster with a few expectations in mind and left the rest blank for students to add their own ideas once the devices were introduced. The class agreed to this final product for use in the classroom.

The last preparation item was the physical location of the iPads. Students needed to be able to independently access the devices. I wanted students to

show responsibility and ownership of these new learning tools by plugging them in, putting them away in the appropriate location, and cleaning the screens when needed.

Student friendly iPad organizer in learning environment.

Integrating Devices

With all of the device management items completed the classroom was ready to integrate the iPads. I decided to start introducing the use of the iPads in small portions. At first, I used the iPad during whole group instruction to model how to play some of the phonological awareness games provided by McGraw Hill *Wonders* curriculum, which is provided by the district. In the past, the teacher laptop was used to project and play the same types of games. It appeared to be a good connection for students; show a familiar game using a new piece of technology.

In addition, during whole group instruction, the iPad was used to create interactive stories using mystorybook.com. This allowed students to engage with creating stories during writing time, which modeled in real time the writing objective for the day or week. For example, if students were learning about adding voice through speech bubbles, students were able to work together as a class to create a story and add speech bubbles to the characters.

The students were ecstatic when first shown the new devices. Students were saying, “That’s SO cool!” “When is it my turn?” “Do we all get turns?” “Do we get to keep these in our classroom?” I was thrilled they were excited just to see the devices before even getting to explore them! I reassured the students that, yes, they would all get turns and, yes, the iPads were going to stay in our room. I wasn’t sure how the next question was

going to be received, but I continued by asking students "I see you know these are iPads, but does anyone have an idea of why we would have these at school?" Several students shouted out answers "To play games!" "To watch Netflix" "To check email" were a few of the answers, but most of the answers had to do with playing some sort of game. I affirmed their responses by saying "yes, you are right again! You can play games, watch Netflix and check email on these devices. But at school, I have another job for you to do with them. I want to show you how to use these tools to help us learn! There are several fun, exciting things we are going to do with these devices to help us read, practice our kindergarten words, how to solve math problems and much more!" The students were busy doing a 'silent cheer' to show me they were excited.

Students excited about new learning tool.

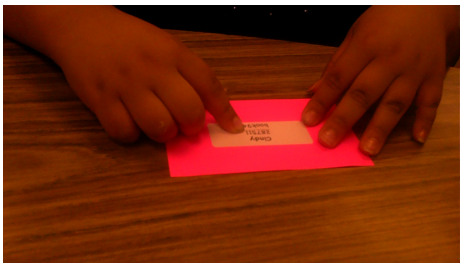
I continued with the disclaimer, "however, what do you think I am going to say about these devices as learning tools?" Students raised their hands to share a general classroom, or another rule related to technology such as "you have to follow the rules or you won't get a turn", "be gentle and careful so it won't break" "do your job and be responsible". I told the students I was pleased with their ability to come up with some

great rules so quickly and they were again, right. I also went on to explain, "These devices are brand new to Mrs. Ray, to Miller Elementary and to you all. We will have to be patient if something is not working quite right, or if we need help. Sometimes new technology can be very exciting and sometimes it can be frustrating when we want it to do something and it doesn't. So don't worry! I will make mistakes, you will make mistakes but we will do this together. Does that sound fair enough?" The students all agreed by giving a thumbs-up, nodding heads, or saying yes. "So it is settled then. We will start learning how to use these tomorrow at guided reading time. I will teach a few students at a time and then a few more. And don't worry! Everyone will have a chance I promise. But there are only three devices and 22 of you, so please be patient as you are waiting for your turn with the iPads." The students spent most of workstation time chatting with one another about the iPads and wondering who would get to go first.

The following day, students couldn't wait to start guided reading. They kept asking and looking at the clock "is it black group yet?" "When is work station time Mrs. Ray?" "Will my group go first?" I reminded students that each group will have a turn just like normal guided reading groups but it was going to be a little tricky at first while we figure things out. To begin, I chose the guided reading group whose students had the highest Developmental Reading Assessment (DRA) scores for two reasons: 1) these students are on or above grade level in their reading skill 2) several of these students had prior experience manipulating a touch screen device. Because this group of students was reading kindergarten material fluently, I anticipated they would use cognitive energies to problem solve around manipulating the devices, rather than trying to decode words.

I called the black group up to the table, which consisted of the six students who had the highest DRA scores. I introduced the *Wonders* app using the regular iPad and the gradual release of responsibility model of "I do, we do, you do". The first item I wanted the students to gain access to were the leveled readers, which are guided reading text available in a digital format from the curriculum. The purpose was to allow students to select the appropriate level of text for independent reading such as approaching grade level, on grade level, above grade level or ELL. These guided reading materials are books, which the students have already read in previous guided reading groups.

Each student had an index card with his or her name, username and password. On the back was the website www.lps.org and the word 'wonders'. Students needed this information to access the *Wonders* login. I showed students how to get to the Lincoln Public School (LPS) homepage and type 'wonders' in the search box. Once they got to the log in site for Wonders, they practiced typing in the username and password for the first partner.



Student card with username and password.

Students successfully reached the Wonders log in from the LPS website when they have reached this screen. Students then typed in username and passwords.

Students were excited when successful saying "it says Letha's backpack! That's me! How did it know it was me?" I encouraged each pair of students to explore the device. "Mrs. Ray what do I do now?"

"Try touching the words *This week's readings* and see what happens." Students saw all of the reading

materials we had been using for the week such as the literature big book, the interactive read aloud, the reading/writing workshop books and the leveled readers. Some students instinctively touched the picture icon of a book cover he or she recognized. When I asked, "why did you tap on the picture of the book *An Orange in January?"* Jeremy responded, "I wanted to see it again. We had this book on Monday." "What happened after you tapped the book?" "I saw it go down to my backpack and now there is a number one on there!" "That's awesome!" Soon the other children were looking at Jeremy's screen to see what he had discovered. Then they were all figuring out how to add books into their backpacks just as Jeremy had done. In less than two minutes time, students were exploring the devices, touching icons to find out the functionality and sharing enthusiasm. This was exactly the type of behavior I was hoping students would exhibit when interacting with the devices.

Two students successfully logging in to find Renee's backpack and adding books to it!

I pulled the pink group next. This group is a mix of ELL students and on grade level readers. I anticipated this group would have more difficulty navigating the devices than the previous group. Vocabulary played an important role with this group. For example, when students were shown his or her card with student name, username and password, direct instruction was needed to label and define terms such as username and password. Further

instruction and scaffolding was needed with terms such as website, search box, and log in. This group did not have as much time with the *Wonders* materials as the previous group; as we spent the majority of time learning how to work with the devices. I wanted to take as much time as needed with students who were discovering how to engage with the iPad functions to ensure he or she knew how to navigate around the device.

Figuring out how the keyboard works and finding a website can be tricky!
Teamwork, problem solving and perseverance hard at work.

As expected, students who had prior experience with touch screen devices, maneuvered more fluently than did those students who were novice. As the time students spent working with the devices increased, so did their confidence and ability. After only a few days using the iPads during guided reading time, students were learning how to quickly navigate to the *Wonders* site, log on to his or her backpack, and select leveled text to interact with or read. At this point, with the success of accessing the guided reading materials independently, students were ready to see other functions and apps on the iPads.

During large group instruction, using Apple TV, I showed the students how to access the apps they could choose to play during workstation time, or as an early finish activity during guided reading. The apps I wanted students to learn about were skill based practice with a 'game' like modality. For example, in Letter Ninja, students swipe across a specific letter with the goal being to correctly swipe as many as possible.

Findings/Discussion

At the start of this research, students were in the beginning stages of manipulating the devices using the *Wonders* curriculum to read appropriate text and complete assigned tasks. Only a few students were independent with logging on, finding the correct key sequence, and tapping the correct icon to get the device, website or page to do what he or she wanted it do to. While most students reported having a touch screen or swipe interface outside of school; smartphones or an inexpensive tablet, the majority of student interaction with those devices was primarily for gaming or entertainment. Utilizing these devices for instructional purposes was a new concept for students. Additionally, students would get 'stuck' quickly. They would either ask for help right away from me before trying any strategies to get 'unstuck', or they would quit the program by going to the home screen right away.

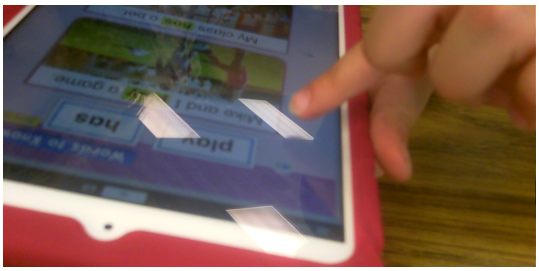

Working through a logging in problem together. Discovered the arrow up button makes letters uppercase.

Now students are comfortable trying several different options before finally asking me such as utilizing the back arrow, finding the 'close book' button, swiping to turn a page, or asking a peer such as a partner or the tech specialist. Most students will tap any picture or icon displayed on the page for trial and error to see if tapping that picture or icon worked to solve the problem. The kindergarteners have experienced productive struggle when working with the devices during their exploratory discovery. These experiences have built


Student discovers the sound icon. She declares, "some pages have this button and some don't. When I push it, it reads the words for me out loud!"

student stamina, engagment, perseverance, and problem solving skills in the classroom.

The integration of technology through iPads has given students the opportunity to engage in learning. Students who were once reluctant to come to the guided reading table, now find it exciting and even anticpate when his or her group is going to be called. It has given students ownership of learning through responsiblility, and being in charge of manipulating the devices in terms of logging on to the website, selecting books to put in his or her backpack, and practicing language arts skills in his or her preferred sequence.



Student self selected High Frequency Word work activities.

It appeared students were ready and motivated to work right away when using the devices. Students self-regulated when choosing leveled readers. For example, if a particular text appealed to a student, he or she would simply tap on the icon to add it to his or her backpack. Then students could go to the backpack and open the selected text. Within the first two or three pages, students quickly realized if the text was too hard, too easy, or just right. The ability for students to choose again and again was motivating at all academic levels.

While another student selects a leveled reader.

The students were not the only onces receiving motivation from the iPads. The access to hundreds of text within a few key sequences was beneficial to the teacher as well. In a traditional guided reading group, all students read the same text. Using the iPads during guided reading offered multiple text selections for students in seconds. This inturn

also offered the teacher several teaching moments through through prompting, probing, and reading strategies that fit the needs of students within that group.

The iPad offered a motivating vehicle for kindergarteners' natural sense of curiosity. Often I heard students mumble, "that didn't work" or "what happens if you touch this?" The students showed resiliency and developed a technology 'grit' so-to-speak. Once students gained confidence in manipulating the devices, they were not willing to give up so easily with the task. Often students, by their own exploration, were able to get themselves 'unstuck'. This will be a much needed skill throughout their educaitonal careers as technology becomes more and more critical to the classroom.

"I've been trying to get the books out of the backpack that I'm already done with."

Challenges

One challenge during this research was teacher training. I learned just as much as the students throughout the integration of the iPads. I felt comfortable trying new technology in ways to make learning fun and engaging however, aside from an iPads in the classroom course taken during the summer 2014 at the University of Nebraska-Lincoln, I didn't have formal training on all the wonderful capabilities iPads can bring to the classroom. I had trouble reigning in my big ideas. As soon as I found an app, or idea to use in the classroom I wanted to jump right in and show it, or use it. But I found quickly I wanted to do too much too fast and the students were not ready for it. I needed to back up

and teach only one component such as accessing the leveled readers or the phonological awareness games, thoroughly before showing other capabilities.

Another challenge with technology has been trouble shooting if an app is not functioning or responding. This was problematic if and when all three devices were doing it. Much of the time I found student user error to be the culprit. For example, if a student did not see a loading bar, or spinning circle to signify an app or website was loading, the students wanted to tap the screen several times in an attempt to make it work. But most often this repeated tapping made it worse. There were a handful of instances where I was unable to figure out why the app or device had stopped working properly. At that point, we would quit and try again next time. Then we would conduct guided reading with traditional text, white boards, markers etc. It was a learning experience for students to see what to do and how to act when the devices did not function as desired.

A final challenge of integrating the iPads in the classroom was once novelty wore off, students' comfort level of exploring other items on the device instead of completing the assigned task increased. Students who were familiar with devices from prior experience at home or in preschool felt the most comfortable navigating away from the intended apps. The camera function was popular at first. I didn't mind the photos of students, but I did explain the expectation that each student in the picture must agree to have his or her picture taken because some students may not want to have a picture taken. We decided as a class to say "so-and-so (while tapping on shoulder) may I take a picture of you?" or "so-and-so would you like to take a picture with us?" The receiving student(s) have the choice to say "no thank you" or "OK". I also discouraged the use of the video component unless the

student(s) had a plan already in mind before recording. Again, not all students wanted to be in a video and I wanted students to see this as a start to their digital citizenship.

Conclusions and Future Study

How do students engage with technology in the Kindergarten classroom? Over the course of a semester, the research in this paper demonstrates how kindergarteners used technology to engage in learning. It started with introducing the iPads as a device during whole group instruction to access curriculum materials and support writing time. Students explored functions of iPads while learning vocabulary and terminology to describe experiences with the devices. Students received small group instruction during guided reading with one device for every two students utilizing the *Wonders* curriculum components. Students increased their ability to problem solve while working with the devices, and grew leadership skills as they modeled and guided one another.

Working with a buddy is awesome! Tech Specialist to the rescue!

The kindergarteners have shown tremendous improvement with handling the IPADS, problem solving when something doesn't go as planned, working together to share

and explore the devices, and how to be responsible and respectful with them. The greatest gain, was that students now see the iPads as a device to have fun and play games while also using it as a tool for learning.

The second greatest gain was what I have learned as the teacher throughout this research. This semester has pushed me out of my comfort zone to try new ways to engage students in their learning by using technology. I set out wondering how young children would engage with technology to increase learning, and while it was the focus of this research, I inadvertently also discovered ways in which teacher attitude, organization and teaching also improves student use of technology to engage learning. I hope to act as a coach within my own building and district to offer help, advice and trouble shooting to those who are also embarking on this journey of technology integration in the kindergarten classroom.

To continue my pursuit of knowledge in how to utilize technology in student learning, I plan to implement items in mathematics, writing and parent involvement this next school year. Reflecting upon the implementation in the classroom this semester, I used the iPad primarily for literacy. I would like to find mathematics components that lend itself to small group work as well as apps students could use to help with skill work during independent time or choice time. The district curriculum, *Math Expressions*, does not currently have an app to supplement the work done in the classroom. I have the apps Snow Day Math and ToDo Math but would like to add more.

During writing time, another way I am using the iPads besides mystorybook, is to take pictures of student writing to display on screen using Apple TV. The students interact with the writing for editing purposes. Students will circle errors such as a lowercase letter,

which needs to be capital, or draw a line between words that lack spacing. In the future, I would like to add another editing component with fluency where students are recording themselves reading their own writing and then watching the recording to find errors. This would also increase students' ability to read their own writing with expression.

Lastly, and perhaps the greatest need for future work, is parent involvement. Students were excited about the new devices in the classroom! They went home and initiated conversations with parents about using the iPads in the classroom for reading group and assignments. This in turn sparked several emails, phone calls, and informal conversations with parents regarding the recent use of the iPads and the *Wonders* curriculum. Based on feedback from parents, there is a glaring need for parents to have some training on how to access items from home and how to use the Wonders 'at home' materials which are provided by the curriculum and district. It is apparent a helpful hints or cheat sheet for parents to use at home is a critical need for families. Several parents have mentioned they forgot or lost the current spelling list, or would like an appropriate reader for students to practice with at home but aren't sure what text meets their child's needs. Having access to the Wonders resources would provide families with the needed information to help parents feel empowered to be teachers at home.

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