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# Pre Kindergarten Students Increased Letter Recognition Ability Through the Use of Educational Apps on Tablets for Classroom Instruction

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Pre Kindergarten Students Increased Letter Recognition Ability Through the Use of  
Educational Apps on Tablets for Classroom Instruction

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Submitted in Partial Fulfillment of the Requirements for the Degree

Master of Science in Education

School of Education and Counseling Psychology

Dominican University of California

San Rafael, CA

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## Signature Sheet

This thesis, written under the direction of the candidate's thesis advisor and approved by the Chair of the Master's program, has been presented to and accepted by the Faculty of Education in partial fulfillment of the requirements for the degree Master of Science. The content and research methodologies presented in this work represent the work of the candidate alone.

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### Abstract

Preschool students are preparing for kindergarten. The kindergarten curriculum is demanding. Students are expected to enter elementary school knowing many aspects related to language arts. The problem at the preschool level is that children need to master letter recognition and letter sounds in order to prepare them to learn how to read. The literature reveals that using technology before they enter kindergarten can be beneficial in developing students emergent literacy skills (Beschoner & Huchison, 2013).

It is important for teachers to meet the needs of all of their students. Using electronic tablets in the classroom is a tool that can help promote the development of early reading skills. Shifflet, Toledo and Mattoon, (2012) showed that by just introducing four tablets into a preschool classroom, the teachers observed the students increased their cooperation and collaboration skills with one another.

Participants in this study include 20 four and five year olds in a private preschool setting in a suburban area. Using electronic tablets, students practiced letter and sound recognition as part of their daily routine. Student pre and post test scores on letter and sound recognition were compared to analyze growth over time, by using technology and specific instructional applications (apps) that focus on early reading skills. Additionally the researcher recorded and analyzed notes which described student behavior during instruction.

Test scores indicated that 19 out of 20 students increased their mastery of upper and lower case letter recognition skills. Results from notes indicated that students were engaged in using tablets and motivated to practice letter recognition skills.

Keywords: master letter recognition and sound, electronic tablets, pre and post tests, motivation, engagement

## Chapter 1 Letter Recognition

Over the past twenty years I have worked with children in many settings. This included working with special needs children and working in the lower elementary public school setting. Eight years ago was the start of my current teaching career in a private pre kindergarten class. This age group is challenging and yet very rewarding. My students arrive and we begin the process of preparing for kindergarten.

Young preschool students are assessed at the beginning of the school year. They have social, emotional, and academic goals. A goal for all students is that they are able to recognize all letters of the alphabet by the end of the academic year. Students practice learning letters using various activities throughout the year. However, many times at the end of the year some students have not made sufficient progress in letter recognition in preparation for pre reading activities in kindergarten. This reality led to my thinking about ways to expand my approaches to student learning.

Discussions with my teaching colleagues who were using technology in their classrooms indicated that their students were highly motivated and engaged in their learning activities. Reports of the benefits of using technology in the classroom were surfacing. Would using tablet apps increase students' letter recognition skills among preschool children?

### Statement of Problem

Preschool teachers nationwide struggle to prepare students for the increasing demands of kindergarten (Beschoner & Hutchison, 2013). Teachers are searching for new ways to prepare their students for elementary school. One idea preschool teachers are investigating is using technology in the classroom (Kol, 2012). The challenge is finding the right apps and using them

in an effective way to increase student knowledge. The problem is that preschool students may have difficulty mastering key pre-reading skills prior to entering kindergarten.

**Purpose Statement**

The purpose of this study is to examine the effectiveness of using specific letter recognition and writing apps on student progress in recognizing their letters for pre kindergarten students in a private preschool setting. The program evaluation study analyzed student test score performance and researcher notes on student behavior during instruction. Upon entering kindergarten, students are expected to recognize all of the the letters of the alphabet and to understand that letters have sounds associated with them. Students entering kindergarten with limited letter recognition ability may have difficulty mastering early reading skills.

**Research Question**

How effective is the practice of using tablet apps as part of the instructional curriculum for increasing letter recognition skills in a private school setting for pre kindergarten students?

**Definition of Terms**

For the purpose of this study key terms are described below.

**1) Tablet apps**

Tablet apps are software applications developed for use on tablets such as iPads and the Motorola Xoom. These apps are available through the Apple App Store and the Motorola Play Store. All of the apps referred to in this paper are for preschool age students and are educational.

**2) Letter recognition**

For the purpose of the study letter recognition refers to all 26 capital and lower case letters and the students' ability to name them when tested by flash cards. While learning their letters students also work on letter sounds although the letter sounds are not assessed at this time.

### 3) Test scores

Test scores refers to the students achievements on individual assessments created and given by the teacher.

### **Theoretical Rationale**

Although mobile learning has been on the horizon for many years, the introduction of tablets has changed mobile learning opportunities for teachers and students (Hutchison, Beschorner & Schmidt-Crawford, 2012). To understand the theoretical rationale behind mobile learning on tablets one must look at engagement theory.

Although engagement theory has been around for many years, in the mid 1990s Kearsley and Shneiderman introduced the conceptualized framework of engagement theory (Bayrak, 2009). The concept of engagement emerged as a key to understand how students effectively work and learn. Essential points of engagement theory includes the concept of self-determination. One chooses to be engaged in an activity, and demonstrates this involvement in an activity, that also includes collaborative problem solving between and among students (Marcum, 2011). This may happen as students are using tablet apps for instructional purposes in the classroom. "Engagement is very similar to intrinsic motivation. Intrinsic motivation fundamentals include meaningfulness, choice, competence, and progress" (Marcum, 2011, p.1) . Kearsley and Schneiderman (1999) stated that students must be meaningfully engaged in learning activities and that the tasks they are completing are worthwhile. This could happen without using technology tools in the classroom. Researchers believe that technology facilitates

this engagement. Engagement theory serves as an appropriate conceptual framework for technology-based learning.

**Assumptions**

Many students who enter public school classrooms across the United States learn how to integrate technologies in schoolwork as part of the process of acquiring academic skills. In order for students to emerge as 21st century learners, introducing them to technology, and specifically to using a tablet for learning, may be beneficial to them. Classroom activities that are successful may indicate that students are highly motivated.

Student attention span is typically short and they may lose interest in an activity if it is not engaging. Using tablets has the potential of increasing motivation and engaging preschoolers, boosting their intrinsic motivation to learn their letters. Having students become familiar with computers and technology before elementary school is highly important (Kol, 2012). Many studies report that students are motivated and excited by using mobile devices in the classroom; when students use tablets they are more engaged and on task (Ciampa, 2014).

**Background and Need**

Little research has been conducted on using tablets for instruction in a preschool setting. However there has been more research on the use of tablets in the elementary school classroom. Reyes (2014) found that using iPad apps with second and third graders had a positive effect in helping them build literacy skills . The researcher conducted a study over a five month period where she supervised student use of iPads in an after school reading intervention program. She researched the effectiveness of the apps in increasing literacy achievement with struggling students.

Reyes used a mixed method approach. She gave a pre and post test and also used her teacher and researcher observational notes to collect her data. She chose educational apps that were specifically aligned to Common Core State Standards in literacy (Reyes, 2014). Reyes found that all students, including English language learners, demonstrated improvement in literacy skills, based on test score results.

**Summary**

Teachers use technology in their classrooms because it is engaging and motivating. The research suggests that children can benefit from exposure to using technology as a learning tool. Tablet apps are an engaging way to motivate students.

Preschool teachers work with students on letter recognition skills as a precursor to beginning reading skills typically taught in kindergarten. Letter recognition is one of the main goals, therefore it is addressed in many ways. Experience taught the researcher that this goal was not always accomplished by the end of the year. This motivated the researcher to find a new tool to enhance learning in the classroom. Discussions with teaching colleagues led the researcher to technology. This, in turn, led to apps already available that could possibly be used in a classroom with electronic tablets. The question was to ascertain the effectiveness of using this tool to teach letter recognition, as measured by student performance using a teacher designed test. Research points to technology integration to enhance academic motivation. Research in the school setting points to increasing literacy achievement through using tablets with children as young as four years old. The following chapter is a review of the literature on the use of technology for instructional purposes with preschool and school age students.

## Chapter 2 Review of the Literature

### Introduction

This section is an examination of the peer reviewed research literature on using tablets in the classroom to improve student academic performance. Although there have been many studies conducted on the influence of technology in the classroom, very little research has been conducted on the effectiveness of mobile technology and specifically the use of apps in the classroom (Fallon, 2013). Information was gathered from academic library searches using online resources. Research information is organized in the following categories: Historical Context, Review of the Academic Research Associated with Technology in the Preschool classroom, and Interview with an Expert.

### Historical Context

Although mobile learning in education has been on the horizon for many years, the introduction of the iPad, and other tablets like it, has changed mobile learning possibilities for teachers and students (Hutchison, Beschorner & Schmidt-Crawford, 2012). Fabian and MacLean (2014) found that key opportunities in mobile learning include: encourage anytime, anywhere learning; reach underserved children; improve 21<sup>st</sup> century social interactions; fit with learning environments; and enable a personalized learning experience.

### Research Associated with Technology in the Preschool Classroom

When Cassandra, a veteran preschool teacher, had four touch tablets at her disposal to use in her classroom she was hesitant to use them in teaching. She had always felt that children spend time using technology at home and that preschool was a time to engage in experiential learning using their imagination (Shifflet, Toledo, & Mattoon, 2012). She found four specific

results. The students were cooperating, collaborating, making connections to the real world, and displaying digital citizenship.

As soon as the tablets were introduced Cassandra saw the students interacting cooperatively with one another. One day she found four students crowded around a tablet playing a memory game. They were all working together, taking turns and appearing to have fun while learning. After several months of use she realized that students rarely used the tablets on their own.

Cassandra found that children were working collaboratively together. She watched one day as three students created an art picture together. One drew a tree, one drew a squirrel and a third student drew a bird. Unlike traditional art where everyone creates their own picture, the tablets allowed students to work collaboratively on a single picture.

Cassandra was concerned that students would fixate on the new technology and no longer be interested in hands on activities. Instead, she found that over time the novelty of using the tablets disappeared and became part of the classroom environment. She developed a project where students could make cookies on the tablets and in real life. She compared the two experiences with the students, discussing with them which experience they found enjoyable.

Students also made a connection to the real world by using the tablets. The cooking activity confirmed what Cassandra already knew: the tablets helped reinforce cookie making steps and introduced new vocabulary, but they still needed the traditional experience of making cookies in real life. She used technology to support and enhance a traditional learning experience, not replace the whole experience (Shifflet, Toledo, & Mattoon, 2012).

Educators may resist using technology out of concern that it is not developmentally appropriate for young children. However, when educators are intentional and selective in its use, technology can enhance early childhood education.

### **Use of Tablets to Assist Dual Language Students**

Touch tablets have been used in different ways in the preschool setting. One of the earliest uses occurred when early childhood teachers began using them to help with dual language learners. It is important for teachers to have as many tools as possible to help meet the language needs of all the students in their class. Technology can be used to find language resources and help the teacher create activities to meet all the language needs in your classroom (Nemeth & Simon, 2013).

When teachers are intentional in their planning and choose technology that aligns with their curriculum goals, they find that technology can be a powerful asset (Nemeth & Simon, 2013). They also found that for technology to be developmentally appropriate, it should be responsive to the ages and ability levels of all the students in class. The authors found that technology could support dual language learners, and it could also help meet the needs of all the children, not only the dual language learners. Technology made it easy to connect with children and their families across language barriers and across the world (Nemeth & Simon, 2013).

### **Using Tablets in STEM Instruction**

Teachers are using tablets to introduce science, technology, engineering, and mathematics (STEM) concepts. Aronin and Floyd (2013) used iPads to teach STEM concepts in a mixed ability group in an inclusive preschool classroom. They selected their apps with four criteria in mind:

1. Students should be the source of action to make the outcome scientific.
2. Students must be able to see cause and effect relationships by changing the beginning action and seeing how it reflects the outcome.
3. The outcome of the changing variable must be observable to the preschooler.
4. The action and reaction must happen immediately for the child to see and make the connection between cause and effect. They also felt that a teacher should always be present when tablets were being used to facilitate social interaction, expand on the skills being taught, and to collect data on student performance (Aronin & Floyd, 2013).

One of the apps instructed students to build a sturdy bridge by using different tools on the app. The students created a virtual bridge, and once they felt it was secure and stable, they tested its strength. They could then reinforce the bridge as needed. By having a teacher present the teacher was able to ask open-ended questions to help extend their thinking. Students would use the app and then were motivated to explore the design and construction of other bridges. Some of the STEM apps that Aronin and Floyd (2013) used in their research were Monkey Math School Sunshine, BridgeBasher, Build a Robot, and Builder Blocks Preschool.

### **Emergent Literacy**

In a study conducted by Beschorner and Hutchison (2013) the researchers introduced six tablets into a preschool classroom of four and five year olds. The study took place over a seven week period. The researchers found that “The iPad, or other similar tablets, can be used in multiple way as an instructional tool to support the teaching of emergent literacy in an early childhood classroom” (Beschorner & Huchison, 2013, p. 20). The use of the tablets helped students develop an awareness of print. As the students became familiar with different apps,

they identified apps they wanted to use. Then they would touch that picture that related to the specific app. One example that the authors used was the students' familiarity with the PBS kids logo. That allowed them to quickly maneuver to that app because they were already familiar with the icon, thus developing their awareness of print.

### **Developing Proficiency in Writing**

Digital technology can increase preschool students emergent writing skills (Beschorner & Hutchison, 2013). Several of the apps that the authors used allowed students to draw figures that were letters or figures that represented letters. The researchers reported that students began to see themselves as writers. They used the Magnetic ABC's app to write words. "The mobile nature of the iPad made this app particularly useful, because students could carry it around as they looked for words in their classroom environment to write using their digital magnets" (Beschorner & Hutchinson, 2013, p.20).

### **Using Technology with Young Children**

Technology has even been used in the preschool classroom with children as young as two years old. In a study conducted in a London preschool, researchers studied different forms of touch. The researchers took a multimodal approach to touch. "Multimodal approaches provide concepts, methods, and a framework for the collection and analysis of visual, aural, embodied and spatial aspects of interaction and environments, and the relationship between these" (Crescenzi, Jewitt, & Price, 2014, p. 87).

The study consisted of seven children ages 27-37 months old. It included two boys and five girls. The materials the researchers used were plain paper, fingerpaints, and three iPad apps. They were looking at using iPads for fingerpainting vs real fingerpainting with paper and paint. The researchers collected data over a five day period. Their findings were very interesting.

When the students finger painted on the iPad they had a wider range of touch, more touches in a period of time, more continuous touches, and more complex sequences of touch. The findings also suggested that iPads promote more and wider variety of touch based interactions (Crescenzi, Jewitt & Price, 2014).

Although the researchers documented many positive outcomes from their study they did find some drawbacks to using iPads instead of real paint. The students lost the experience of the messiness of finger-painting. When using iPads several sensory features were lost, the range of touch modalities used was limited, and the quantity and range of fingers used was restricted. The researchers emphasized that very little research has been conducted in this area with a multimodal approach.

Another early childhood study conducted by Couse and Chen (2010) looked at stylus-interfaced technology in tablet computers and how it could be used with young children for instructional purposes. They conducted their study in a university-based early childhood center located in the northeastern United States. There were forty-one children aged 3-6 years old and they were pulled from three different classrooms. The study was conducted over a six week time period. The researchers wanted to “explore the viability of the tablet computer as a technological tool for young children by engaging them in freehand drawing and self-portraits on the tablet to determine if it could be used as a medium for representing their thoughts and knowledge” (Couse & Chen, 2010, p. 82).

The researchers found that tablets were a viable tool to use in the preschool setting. The students became comfortable with using the tablets to express their ideas. All but one of the students were able to complete a self portrait at the conclusion of the study. The researchers were encouraged by the fact that children in the study were rarely frustrated by the technology.

They persisted when faced with problems, using peers and teachers to help guide them through their technical difficulties. The researchers did caution that one draw back to using technology with young students is the lack of empirical research. They recommended more research should be conducted with a large sample and in a variety of early-childhood settings.

### **The Role of Teachers**

In most cases teachers are looking to use technology to teach skills to their students. In a study conducted in Queensland, Australia researchers wanted to examine young children's engagement with digital technology and the opportunities it provided for learning. Their research consisted of recording interactions between children and teachers in the classroom. They also conducted two surveys: one to parents and one to the teachers at the school to gather further information.

They found that teachers have an important role to play with meaning making and technology. In the study the researchers observed an interaction between the students and the teacher as they viewed a you tube video of the students family getting stuck in a mud bog. They found that the teacher, by asking questions and facilitating the conversation, helped the students to develop ways of communicating about this digital technology. They asserted that technology can and should be used for more than just teaching skills and that more research should be conducted in this area (Davidson, Given, Danby & Thorpe, 2014).

### **Library Use**

Another place tablets are being used is in public school libraries. One study conducted in Chicago public school libraries found that iPads engaged students in developing their reading, writing and speaking skills (Perez, 2013). The study included five schools. Each school

received 32 iPads, a MacBook and a charging cart. The study was supposed to last for one semester but it was extended to include the entire school year.

The researchers found that the program far exceeded their expectations. The iPads were an engaging way to help students improve their reading, writing, speaking, and listening skills and addressed Common Core State Standards in a motivating way. The iPads were used by the students in a variety of ways. They used them to shoot video, record their voices while reading, create digital drawings and to express their learning (Perez, 2013).

One group of fourth grade students used the iPads to record themselves acting out the Three Billy Goats Gruff story. One student read the story while several others acted it out. They then showed it to the second grade class to get them excited about reading. Another group of students used them to research about insect anatomy and then created insect diagrams using the Doodle Buddy app. The researchers found this study to be very successful. Students were creating ebooks, videos, slideshows, pod casts, and graphics to demonstrate their learning (Perez, 2013).

In a recent Taiwanese study researchers surveyed 366 preschool teachers. They wanted to explore the teacher's technological pedagogical content knowledge (TPACK). The researchers found that technology is playing a critical role in improving early childhood education pedagogical content for preschool teachers. They also found there is a need to train preschool teachers to become familiar with new teaching environments by using technology. They felt that preschool teachers education must change to include technology related information. It is important to mention the researchers found the teachers age and years of service were important factors in their TPACK knowledge (Liang, Chai, Koh, Yang, & Tsai, 2013).

**Interview with an Expert**

Susan (anonymous personal communication, October 6, 2015) has 14 years of experience as a teacher in a suburban northern California town for the past 14 years. Most of her work included teaching first grade, with some experience teaching second grade. She has used technology in her classroom throughout her career, and is now increasing her use of technology. For many years she had two classroom computers and for the last few years she has had access to a set of eight tablets for student use.

With her increased use of technology she has seen a shift in the students' level of engagement. She specifically said her group of high achieving students and her group of low achieving students benefit from the tablet and computer usage. The amount of time these students use a computer or tablet in class averages out to about twenty minutes per day.

When I asked Susan how supportive her school district leaders were she said she felt they were semi supportive. They provide opportunities for teachers to take trainings on using technology but teachers have to be motivated to want to increase their knowledge and take the initiative in getting the trainings.

The only drawbacks Susan has found with the increased use of technology is technical difficulties. If she has planned an excellent lesson and the computer crashes she could spend precious learning time trying to get it to work. She also expressed frustration with her technology support staff. The district shares one person who is definitely overwhelmed and does not have enough time to support all the teachers at each school. Susan said it could take weeks for support staff to get back to her when she is experiencing technical difficulties. She said she relies more on other teachers or friends to help her when she runs into problems.

When I asked Susan her feelings on preschool students using technology she was supportive of it. She has three boys of her own and she has seen the benefits of using educational apps with them. She expressed concern on the amount of time they would be using technology tools and thought that it should be limited. She also expressed that preschool teachers should be only using tablets to help implement their curriculum and not just allow students to use them recreationally.

**Summary**

Technology, specifically tablets, are being used in the preschool and elementary classroom to provide engaging and motivating ways to learn. Students are benefiting from these new experiences with technology. Teachers are becoming confident and adept at using technology in their classrooms. It is no longer a question of should teachers use technology, but rather how and when it should be implemented to support students in their learning.

Using the basic premise put forth by Fadian and MacLean (2014) that key opportunities in mobile learning include that they fit with learning environments and create a personalized learning experience, the researcher decided to examine and measure results in a small preschool setting. In one study, a teacher used technology to support and enhance a traditional learning experience, not replace the whole experience (Shifflet, Toledo, & Mattoon, 2012). The researcher used this premise to specifically apply tablet use to enhance letter recognition for preschoolers in preparation for kindergarten. This extends the use of tablets for a specific task in the educational setting, adding further support to new uses of technology in the classroom.

When teachers are intentional in their planning and choose technology that aligns with curriculum goals, they find that technology can be a powerful asset (Nemth & Simon, 2013). The present study fills a gap in the literature, documenting preschool student letter recognition as

measured by pre and post test scores. The iPad or similar tablet can be used in multiple ways as an instructional tool to support the teaching of emergent literacy skills in an early childhood classroom (Beschoner & Hutchison, 2013).

### Chapter 3 Method

#### Research Approach

This study was an evaluation of the effect of technology use on improving student letter recognition skills, and assessing and improving teaching practice (Patten, 2014). The teacher/researcher focused on improving her teaching practice, specifically by introducing tablets and specially designed apps that increased proficiency in letter recognition skills for preschool students. This is an ongoing process that is focused on improving teaching and learning (Hendricks, 2013). The researcher collected quantitative data from pre and post test scores on preschool children's ability to recognize letters. Additionally the researcher collected qualitative data based on her observational notes on each student. Data were collected over a five month period, beginning January 2015 and ending in May 2015. The researcher compared pre and post test scores to evaluate student performance over time. The researcher also examined observational notes to identify recurring themes during student use of tablets.

#### Ethical Standards

This paper adheres to the ethical standards for protection of human subjects of the American Psychological Association (2010). Research involving classroom teaching practices is not subject to Institutional Review Board for the Protection of Human Subjects. The researcher holds a California teaching credential, and these students are assigned to her for the instructional year. Data were compiled as part of the ongoing evaluation process at the school. Information was used to inform teaching practice.

**Sample and Site**

The study took place in a private faith-based preschool in Northern California. The classroom is a pre kindergarten room and has between 16 and 20 students depending on the day of the week. Children attended school from two to five days per week. The children ranged in ages from 4-5 years old. The class was composed of 12 male students and 8 female students. The socioeconomic background of the students varied because some families paid privately, at high tuition rate, while others were on voucher programs that let them attend the school for free. The students used the tablets for 15 minutes a day, five days a week, for five months. The students who only attended school two days a week only had access to the tablets for the days they attended.

The researcher and her assistants supervised the tablet activities with the students. One assistant worked at the preschool for eight years and has a Bachelor of Arts degree. The second assistant is new to the teaching field and has just begun her career in early childhood education. The researcher taught the assistants how to use the tablets with the students and supervised all activities. In order to identify appropriate instructional apps, the researcher read reviews, and talked to parents and other educators to select apps for instruction. The researcher chose apps with three criteria in mind: Were the apps educational? Would they promote cooperation? Would they increase letter recognition skills? The four apps the researcher selected to use were: Letter School (Sanoma Media Netherlands B.V 2014), Teach Me (24x7 Digital LLC., 2014), Starfall (Starfall Education LLC., 2014), and Alphabet Zoo (Joseph Baird, 2013).

**Access and Permissions**

The researcher is the lead teacher in the pre kindergarten classroom where the data were collected. The data were collected through pre and post tests and teacher observations of the

students. The agency director reviewed the program evaluation project and granted approval for the researcher to conduct the study evaluating the effectiveness of using tablets to increase letter recognition skills with preschool students. See Appendix B.

**Measurement**

The researcher used teacher designed pre and post tests to assess students. Therefore there is no information on factors such as reliability and validity. The researcher also used anecdotal notes to identify which students were motivated and engaged and how often this occurred. Student progress was calculated by testing at the beginning of the five month time period for letter recognition of both upper and lower case letters. This testing was repeated at the end of the study and the results were graphed.

**Data Gathering Procedures**

Quantitative data were collected from pre and post test results. The tests were created and administered by the researcher. Qualitative data were also collected in the form of anecdotal notes the researcher had written on each student's progress throughout the five month study. The researcher was looking for any positive effects of using tablets with her students.

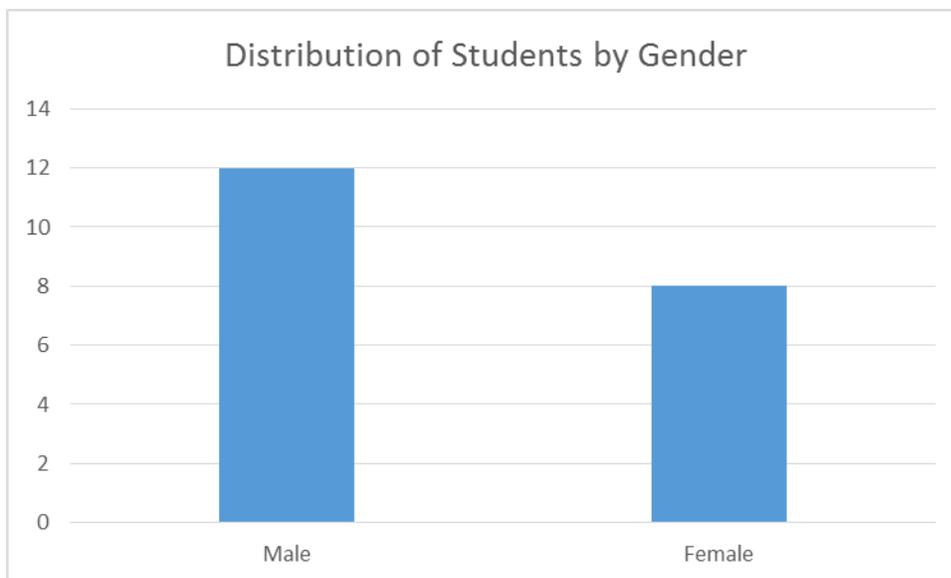
**Data Analysis Approach**

Quantitative data were displayed in graph form to visualize student progress towards recognizing the 26 capital letters of the alphabet. Qualitative data were collected through the researcher's notes and observations. Data were analyzed to identify the effects of using tablets to teach letter recognition skills in a preschool classroom.

### Chapter 4 Results

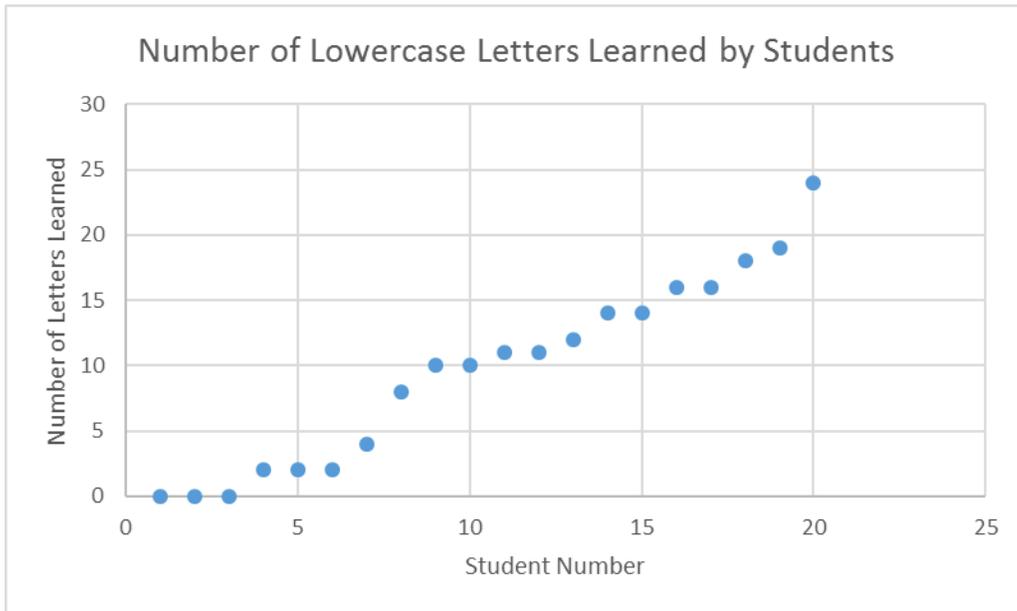
Educational tablet apps increased preschool students' letter recognition skills. All students made progress in increasing letter recognition skills. The one student who made limited progress was recommended for further assessment as a result of particular special needs. Data supports that using tablets in the preschool classroom is an engaging and motivating way to teach letter recognition. The pre and post test scores showed an increase in student upper and lower case letter recognition skills. The results of the study support that educational tablet apps may help increase preschool students letter recognition skills.

**Graph 1 Distribution of Students**

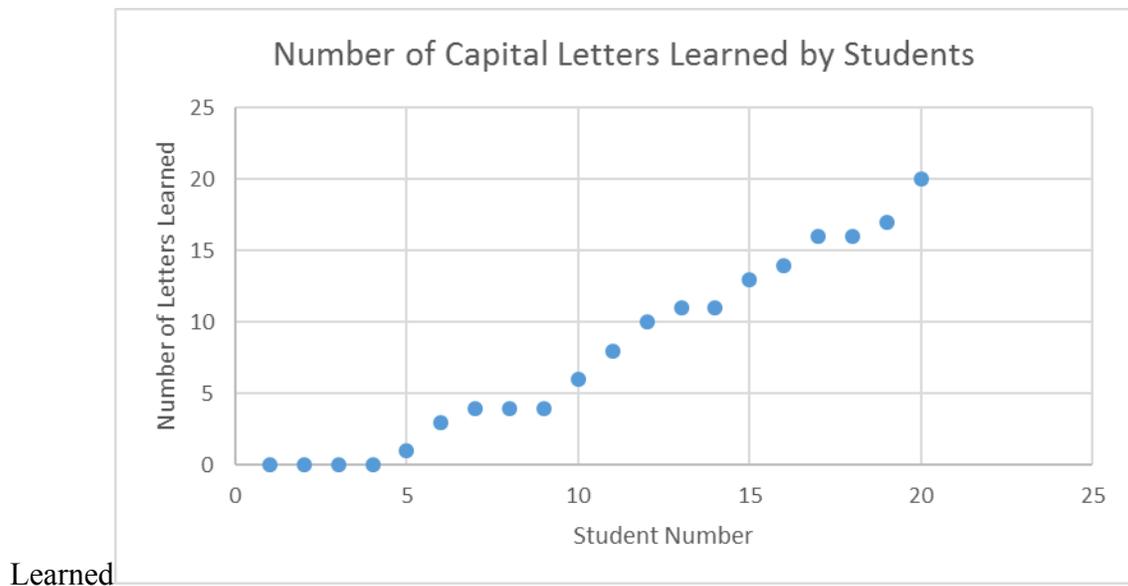


The above graph shows how many students in the class were female and how many were male.

**Graph 2 Lowercase Letters Learned**



Graph 3 Capital Letters

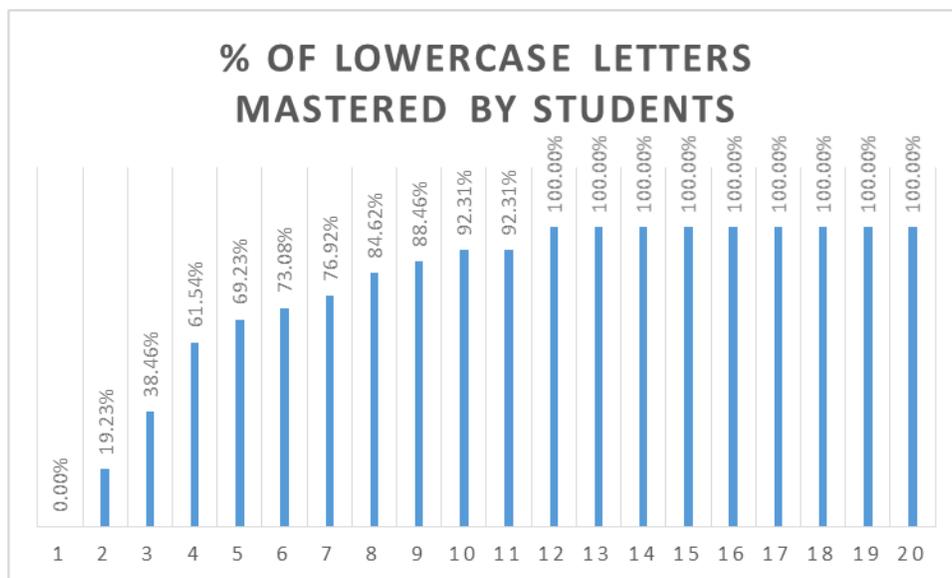


Learned

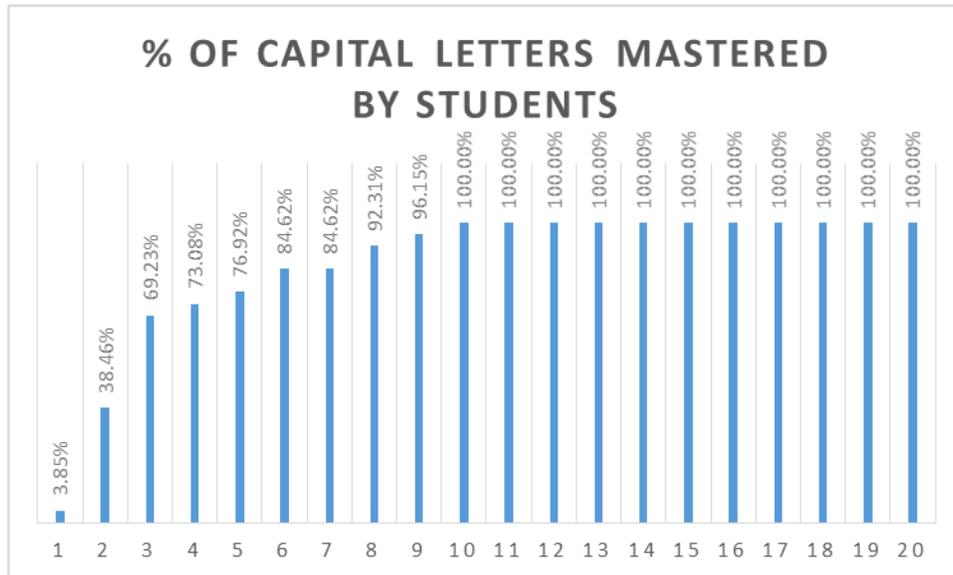
The two above graphs illustrate how many letters the students learned after the introduction of tablets. For example if one examines the chart indicating capital letters learned,

one notices that the 20<sup>th</sup> student mastered 20 capital letters after the introduction of tablets. Prior to the introduction of tablets the student only knew six of the capital letters. This student made the most progress, compared to others. It is also important to note that the four zeros written on the capital letters chart indicated that specific students already knew all 26 letters at the start of the study. They were able to carry over their letter recognition knowlegde when tablets were introduced to all students.

**Graph 4 Lowercase Letters**



Graph 5 Capital Letters



Graphs 4 and 5 illustrate how many letters the students mastered by the end of the study. Data indicated that 10 of the students had mastered all 26 capital letters. It also shows that 15 of the students knew 80% or more of their capital letters by the end of the study.

### Qualitative Analysis

From the moment the tablets were introduced all of the students were highly engaged. The students would be very excited to go into small groups to work with the tablets. At the conclusion of small group time, students would resist the class period ending, and consistently ask for “just one more minute” with the tablets.

When the students worked with the tablets they were always paired with a partner. The partners displayed collaboration and cooperation throughout the study. If one student was struggling to exit out of an app and turn off the tablet, another student would jump in and happily help out. The students would often help each other decide what app they wanted to work with

for the class period. The researcher often overheard students compromising on which one they would choose.

One incident occurred where a child was struggling with use of the tablet to perform a task, he wanted to switch to a different app. Another student helped the child to understand how to switch between apps and then relinquished the tablet back to the first child to complete the task. This was a good example of enhanced cooperation.

At another time a child commented that he was wondering when he could take a turn and was reassured by the other children that they were all going to take turns. Knowing that he would be getting a turn shortly gave him the ability to wait. The students often showed a willingness to share the tablets with each other showing enhanced collaboration.

Over the five month period the researcher observed the students working with the tablets, there were very few disagreements amongst the students. They consistently were happily engaged with each other and with the tablets. The researcher provided support when needed but most students worked independently and needed very little help from the researcher.

### **Summary**

The data indicates that using educational tablet apps with preschool students can be an effective tool to increase letter recognition skills. The results of the pre and post tests, and the analysis of the researcher's notes demonstrate that using tablets with preschool students can contribute to increased letter recognition skills. It must be noted that the researcher chose the apps that would specifically focus on letter recognition skills. She also worked very closely with the students to support their learning and ensure that they were working at their target level. Students should have access to the tablets consistently over an extended period of time in order

to see an increase in letter recognition skills. The following chapter is a discussion and analysis of the major findings from the study.

## Chapter 5 Discussion /Analysis

### Summary of Major Findings

The findings of this study suggest that using tablet apps with preschool students has a positive effect on their knowledge of letter recognition skills. Analysis of the data revealed two broad themes that relate to the effectiveness of the tablet apps. Based on the qualitative and quantitative data presented in the study the researcher concluded the following:

1. The use of tablet apps increases students' letter recognition skills.
2. The tablets increased students' motivation and engagement.

The data showed an increase in letter recognition with all of the preschool students who participated in the study. All students showed improvement in letter recognition skills regardless of their socioeconomic status, background or race. However, students who came to school five days a week and therefore had more time with the tablets, showed greater improvement compared to students who were only in attendance two or three days per week.

### Comparison of Findings to the Literature

The findings in this study are aligned with prior research. Although many of the articles reviewed consisted of studies conducted in early childhood education settings, they did not specifically examine letter recognition. The researcher did find similar results in her literature reviews. Nemeth and Simon (2013) found that tablets helped dual language learners enhance their learning. The researcher had several dual language learners in the classroom and also noted that they seemed to make more progress in letter recognition compared to native English speakers. The literature showed that tablets were engaging (Ciampa, 2013). The researcher also confirmed that students were engaged and motivated when they were using tablets in the

classroom. Perez (2013) found tablets to be an engaging way to promote and improve listening and speaking skills, also similar to the results found in the present study. Additionally the researcher noted that students displayed cooperation with others. Shifflet, Toledo, & Matton (2012) also found that to be true. This study provides educators with data on how to effectively use tablet apps with preschool students. The researcher used the tablets in small groups. The small groups would be 4-6 students depending on the attendance for the day. Students would work with the tablets with a partner for 15-20 minutes each day. Each student was required to start on a letter they did not know and then could move on to different letters. The researcher provided support when the students needed it.

The previous literature reviewed revealed three themes that address the effectiveness of using tablet apps in the preschool setting. Each of the themes is largely based on qualitative data that provides an understanding of how tablets can be used to promote learning and engagement in the preschool setting.

1. The mobile design of the tablets make it a viable tool to enhance learning in the preschool setting (Beschoner & Hutchison, 2013).
2. The use of tablets in the preschool setting increase students motivation and engagement (Ciampa, 2014).
3. The use of tablets fosters cooperation and collaboration among students (Shifflet, Toledo, & Mattoon, 2012).

The research findings of this study are closely aligned with these themes. The first theme, mobility of the tablets, allow for enhanced learning. In several of the studies the learning that was taking place happened because students could move about the room with their technology

device in their hands. The second theme reported in several studies indicated that students displayed an increase in their motivation and engagement. The students in the present study were motivated to use the tablets that they would continually go back to the classroom schedule to note when they would have another opportunity to use the tablets again. Lastly, the benefit of collaboration was a theme throughout several of the studies. Students were typically working and collaborating together and were rarely seen using the tablets individually. This study adds to the body of research on the effectiveness of using tablet apps in the preschool setting.

### **Limitations/Gaps in the Research**

This study was limited for several reasons. First, the research sample was small. It only included twenty preschool students and should be repeated with a larger sample to confirm its validity. Second, the researcher had a strong relationship with the students and this may have effected the results. Lastly, the study was conducted over a short period of time. Additional research is needed to examine the effect of using tablets and instrutional apps in the preschool setting over an extended period of time.

### **Implications for Future Research**

Studies have shown using mobile technology is an engaging and motivating way to implement curriculum. Future research is needed to examine the effects of using tablet apps with preschool students. This study found implementing tablet apps to teach letter recognition skills was an engaging and motivating experience. What other parts of the curriculum could be enhanced by tablet apps? Future research should also study developmentally appropriate time limits to technolgy usage by preschool students.

**Overall Significance of the Study**

Using tablets in the preschool setting has only been researched in the past few years. There is very little research specifically looking at using tablets to increase knowledge in preschoolers. This study is significant because it gives additional quantitative and qualitative evidence, which shows that preschool students can benefit from the use of educational tablet apps. This study will also be beneficial to preschool teachers. It will help them determine how they can use tablets to implement their own curriculum. Using technology in the preschool classroom needs to be researched more, this study is adding to that body of research.

**About the Author**

Corrie C. Giugni has been a preschool teacher for the past eight years. Corrie's desire is to find the best way to prepare her preschool students to become 21<sup>st</sup> century learners and to be ready for the fast paced educational world they are about to enter. She feels she can do that best by incorporating technology into her daily curriculum plans. Corrie looks forward to continuing to find ways to incorporate technology in her classroom. She plans to continue to research how beneficial these additions are to young learners.

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Appendix A

Test of Letter Recognition

Circle the letters the students recognize. Use flash cards to assess both capital and lower case letters.

1. A B C D E F G H I J K L M N

P Q R S T U V W X Y Z

2. a b c d e f g h I j k l m n o p

q r s t u v w x y z

**Appendix B**

LETTER REQUESTING PERMISSION OF THE PRESCHOOL DIRECTOR

Dear Linda,

I am currently enrolled in a master's degree of education at Dominican University of California, San Rafael, CA. As part of my graduate thesis, I am designing a research program that studies how educational tablet apps can help students increase their letter recognition skills. The purpose of my study is to evaluate the students with pre and post tests to see if their letter recognition skills change over the course of the study. Additionally I will be taking notes on student behavior while they are using tablets to improve letter recognition skills.

My program evaluation research project will take place in spring, 2015. The research project will consist of using tablets in my classroom for fifteen minutes a day, five days a week. The test of letter recognition skills is designed by me, based on an important skill in developing children's ability to learn how to read.

This research project has been reviewed by my faculty advisor and approved. If you have any questions, please do not hesitate to contact me or, if you prefer, Dr. Madalienne Peters at Dominican University of California (415) 484-3285.

Sincerely,

Corrie Giugni

I agree that Corrie Giugni may evaluate preschool students' letter recognition skills as part of her research for the degree, Master of Science in Education. I also understand that the final thesis will become part of the research database, Dominican Scholar, Dominican University of California.

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Signature

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Date