

Can I Play, Again? Using a Literacy App to Increase Letter Recognition & Phonemic Awareness

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Abstract: *The article chronicles the use of touch screen tablet technology to provide additional literacy instruction to a kindergarten-aged boy to address letter and phoneme identification. Use of the touch screen tablet device with a literacy-based app increased the time the child was engaged with literacy instruction, without increasing the demands on the classroom teacher. This intervention increased the child's letter and phoneme recognition in a relatively short amount of time.*

Technology is everywhere in today's world. Whether it is televisions, smart phones, touch screen tablets, or gaming devices it seems as though today's children are constantly interacting with some sort of technological device. It is an unavoidable reality that young children are encountering technology in a variety of ways and in many different contexts. In fact, the U.S. National Library of Medicine (2013) reports that children spend an average of 5 to 7 hours per day using all types of screen time (TV, computers, video games, mobile devices). With this realization came the question: Why are children so interested in technology? The most reasonable answer is a simple one: children are motivated by technology because it is both interactive and provides immediate feedback (Cullen, 2015). Technology has been documented to increase child interest (Christenson, Reschly, & Wylie, 2012), and eliminate monotony (Goodman, 2014).

If a student is self-motivated to interact with technology, then technology could naturally become a useful teaching tool within the classroom. The idea of the motivational value of technology within the classroom is what led to the development of this research: Could technology be implemented as an intervention for a specific student to increase letter recognition and phoneme identification? We believed that with the proper application, the interaction and feedback provided by the touch screen tablet technology would hold the student's attention, exposing him to fundamental literacy skills.

The following vignette chronicles how teachers can use their prior knowledge of children's interest in technology to create meaningful learning opportunities within the early childhood classroom.

Mr. Phillip looked at the children busily writing in their journals in the writing center. Then he noticed Malik distractedly looking at the other students and staring at his journal. He recognized Malik was having difficulty. He seemed frustrated during journal time and quickly left the area each day. He tried to think about the things Malik seemed to enjoy; it would be helpful to pair something he preferred with an activity that was challenging.

He remembered Malik's interest in his mother's cell phone. Each day when she arrived Malik asked for it right away and began playing games, screaming with delight as he interacted with the game. Mr. Phillip began to investigate software applications that could address Malik's need to master letter and phoneme identification, while using technology. He found an application for the touch screen tablet device that addressed exactly what Malik needed! This could give Malik both exposure to the skills he needed to master while also providing him with feedback at his own pace. Would the device hold his attention? Would it assist him in skill development??

Review of the Literature

There are a multitude of academic and social skills that are addressed in the early childhood classroom to prepare children for future success in schooling (Phillips & Shonkoff, 2000). Children are expected to enter kindergarten with some basic understanding of the alphabetic principle: recognition of some upper and lower case letters, and some letter-sound relationships (Copple & Bredekamp, 2009). These are considered keystone or foundation skills, which are the building blocks for reading (Kostelnik, Soderman, & Whiren, 2011).

Presently, there are a variety of technological devices and programs that are garnering the attention of children at a very young age. The American Academy of Pediatrics and other leading early childhood organizations have cautioned on the overuse of media devices in the lives of young children, (American Academy of Pediatrics, 2013); however, there is recognition that with guidance, technological devices can be valuable tools for learning and development (NAEYC, 2012). There is evidence that technology-assisted instruction can be beneficial for young children (see Cheung & Slavin, 2012 for a review). If children are having difficulty acquiring basic letter recognition and phoneme identification, it seems reasonable to tap into young children's interest by providing technology that will address children's deficits using a highly motivating medium.

Method

My research plan was to find an intervention that the target child, a five-year-old male, would enjoy interacting with, that could be easily integrated into the normal flow of the classroom, and would not make the child feel frustrated by what he did not know. Based on my observations of his interaction with his mother's cell phone, I knew that the target child was very interested in technological devices, but I needed to learn more about educational technology resources that were available.

Setting and Participants

Data collection took place in a kindergarten classroom consisting of 17 children (9 boys and 8 girls). No children in the classroom had an individualized education plan (IEP). The classroom was arranged into learning centers of dramatic play, writing, art, library, computer, and felt and magnet boards. Children moved between teacher-directed activities and had between one and two hours each day to work in different learning centers. The classroom was staffed by a lead teacher, who had a master's plus 30 and National Board Certification in Early Childhood and had been teaching kindergarten for ten years, and an early childhood student teacher (first author) who implemented the research project.

The target child, Alex, was a five-year-old boy who did not reach benchmark on the beginning of the year on the kindergarten version of the *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS – Good & Kaminski, 2007) assessment. The DIBELS is an assessment that looks at the “big ideas in reading” that are indicators of that are predictive of later reading proficiency (University of Oregon, 2015). I understood that for Alex to catch up, I needed to address these skills now. Information provided at the beginning of the school year indicated that Alex had not attended preschool, therefore making this his first school experience; this prompted me to look for an intervention that would be enjoyable and not feel like skill and drill. If this intervention was deemed effective, it would be a good addition to materials that are available to all children during center time earlier in the school year to practice or reinforce skill development.

Data Collection and Analysis

Observation sessions of the target student took place within the kindergarten classroom with familiar adults. Data were collected each day by the first author at a small table during journal time. All assessments were conducted in one sitting and took approximately 10 minutes to assess all three categories (upper case, lower case, and phoneme identification). A deck of cards depicting either upper or lower case letters were used during the assessment. The examiner asked the child to either state the name of the letter or the sound that the letter made. Cards were shuffled and presented in random order during each assessment.

Instrumentation. A Letter/Phoneme Identification Checklist consisting of three columns (for upper case, lower case, and phoneme identification) was used to record Alex’s letter and phoneme identification. Responses were given an X if they were correctly identified within 3 seconds, or circled if they were not answered correctly within 3 seconds. After each assessment was completed, the percentage of correct responses was totaled for each column (upper case, lower case, phoneme identification) by dividing the number correct by the total number X 100. This same method of assessment was used after each intervention session and was found to be equally useful at those times.

Experimental Conditions

Baseline. Data were collected using the Letter/Phoneme Identification Checklist (Table 1). If the child was not able to correctly identify the letter or phoneme, he was not told the correct letter before moving on to the next card. The teacher was given no instructions about her behavior other than to do what she would normally do within her typical teaching routine.

Table 1. Checklist for correctly identified uppercase letters, lowercase letters, and phonemes.

Date	Letter Sound (when shown)	Naming (when shown)	
	A	A	a
	B	B	b
	C	C	c
	D	D	d
	E	E	e
	F	F	f
	G	G	g
	H	H	h
	I	I	i
	J	J	j
	K	K	k
	L	L	l
	M	M	m
	N	N	n
	O	O	o
	P	P	p
	Q	Q	q
	R	R	r
	S	S	s
	T	T	t
	U	U	u
	V	V	v
	W	W	w
	X	X	x
	Y	Y	y
	Z	Z	z

Literacy Touch Screen Tablet Device App Intervention. An application for the touch screen tablet device was identified to address the concepts that Alex needed reinforcement with: upper and lower letter identification and phoneme identification. While there are several applications that address these, the *Phonics Bunny ABC 123 Color Book* application was used. This application was available on an Android device and was used with headphones. This application was selected because it was simplistic and did not incorporate other skills, making it easy for Alex to navigate. The child used the touch screen to select a letter (upper or lower case), hear the letter name, listen to two words that start with the selected letter, and then trace the letter with his finger. Alex was introduced to the application by the first author, who explained how it could be used and manipulated. His learning was reinforced through audible and visible reinforcements, which appeared to be a motivational factor for Alex. Headphones were used so that Alex could control the volume of the game completely on his own, while not disrupting other children in the classroom. If he traced the letter correctly with his finger, positive reinforcements (such as “Good job!” and “Fantastic”) were given as well as a visual check mark. If it was incorrectly traced, however, the application would not allow Alex to continue. He was visually and audibly prompted to try again. On the third attempt, arrows indicated the correct way to trace the letter so that Alex could proceed to the next letter. Alex was given 15-20 minutes per day to use the application during free play center time each morning. Immediately following each intervention session, data were collected in the same manner described in baseline data collection.

Research Design

A single subject A-B research design was used to measure Alex’s letter recognition and phoneme identification before and during the Literacy Touch Screen Tablet Device App intervention for a period of two weeks.

Findings

Results of the present study indicate that the technology intervention was successful in increasing both letter recognition and phoneme identification (Figure 1).

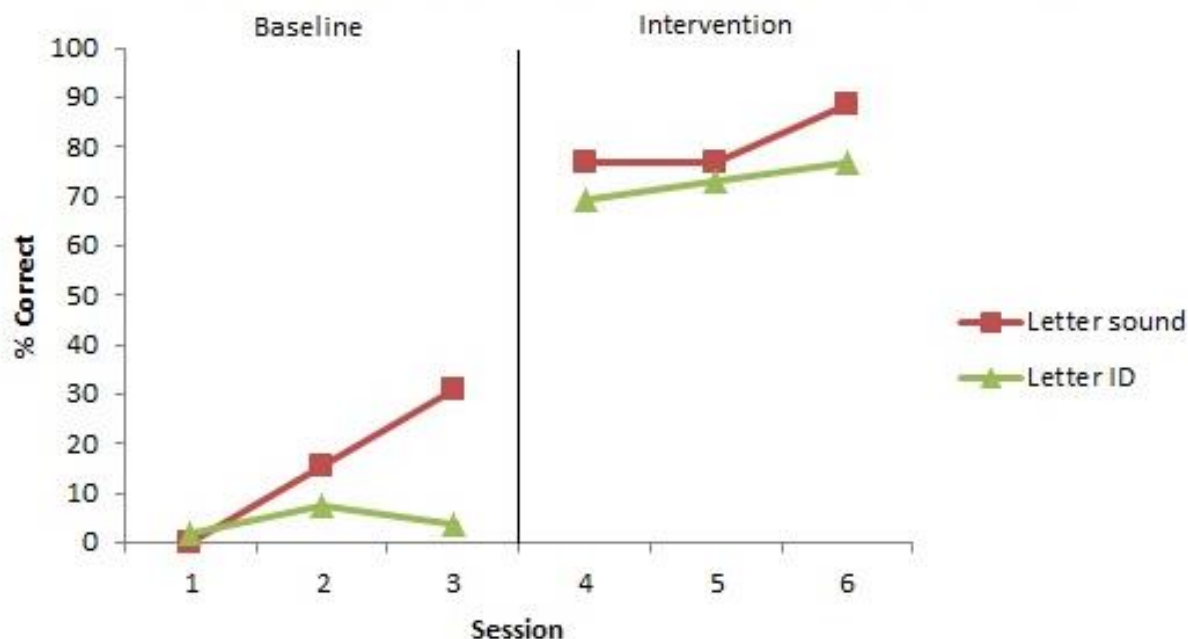


Figure 1. Percent of correctly identified letter names and phonemes.

Letter recognition. During the baseline data collection, Alex correctly identified letter names 5% (range, 1-10%) of attempts. Following the technology intervention, Alex correctly identified letter names an average of 73% (range, 65-80%) of attempts. This represents an increase of 69 percentage points.

Phoneme Identification. During baseline data collection, Alex correctly identified letter sounds when shown uppercase letters an average of 26% (range, 0-35%) of attempts. Following the technology intervention, Alex correctly identified phonemes an average of 81% (range 75-90%) of attempts. This represents an increase of 55 percentage points.

Discussion

The Literacy App Intervention was successful in increasing the letter and phoneme identification of a 5-year-old kindergarten-aged child. This is consistent with previous research, which found touch screen tablet device applications to be effective tools in increasing literacy skills (Reyes, 2014) and basic math fluency (O'Malley, Jenkins, Wesley, Donehower, Rabuck & Lewis, 2013). Alex appeared to be highly motivated by the use of an iPad and a free application called *Phonics Bunny ABC 123 Color Book*. Each day when he arrived, he asked if he would be able to play the games that day.

I believe that Alex's eagerness to use the application is what ultimately led to his success. From his perspective, using the iPad application seemed like a reward or special treat he was receiving. I found that because he was highly motivated to use the intervention, his full attention was given each and every session. We know that attention is a prerequisite to learning (Bandura, 1989); by finding an intervention that held Alex's attention and motivated him to stay engaged, exposed Alex to the literacy information he needed to master for a longer period of time.

In addition to motivating him, I also found that the use of an iPad application for this intervention removed the element of stress or pressure. It did not appear that Alex realized he was working with the application because he needed additional support in developing literacy skills. In fact, his body language and demeanor during our sessions reflected that he felt relaxed and comfortable with the method of intervention chosen. The combination of feeling motivated, relaxed and comfortable with the intervention has the potential to give children the support needed to further develop basic literacy skills.

Implications

The Literacy Touch Screen Tablet Device Intervention was a relatively simplistic, easy-to-implement intervention that did not interfere with the classroom routine. Alex could use the application within the writing center of the classroom without disrupting or distracting the other children who were journaling or working in small groups. Initially, it was intended that he would use the application for 10-15 minutes at a time; however, because he often asked, "Can I play, again?" he was allowed to use it for 15-20 minutes each session. This worked well because it allowed him more time to go through the alphabet both in uppercase and lowercase letters. This technological intervention seemed to make practicing these skills more enjoyable for the child.

When selecting a technology application, there are several variables to consider. Teachers should think about the age of the child, the simplicity of the application, and which skills the child needs to practice. The application should provide reinforcement and error correction in order to promote learning. There are several checklists that teachers can use that will guide them in making application decisions, such as ipads4teaching.net, eskillslearning.net, Arizona K12 Center (azk12.org), and the Technology Integration Matrix (fcit.usf.edu). Teachers should plan for the use of applications in the same way as they design lessons; ensuring that learning objectives are addressed.

Ideas for Continuing Research in the Classroom

The use of technology with young children is highly controversial (see NAEYC & Fred Rogers Center, 2012); it is the responsibility of the classroom teacher to ensure that this motivating technology is used in ways that will benefit young children. Teachers could target skills that young children find challenging and identify resources on the iPad that address these areas. There are a wide variety of educational applications available; however, teachers need to research these applications to ensure that they address skills that are meaningful to the child's overall development.

Future research could investigate the amount of time children spend with traditional literacy activities in the classroom as compared to technology-based literacy activities to determine if 1) children engage with technology-based literacy activities for longer periods of time, and 2) if increased time with technology-based literacy activities develop literacy skills. This intervention could provide needed opportunities during the acquisition phase of learning by introducing this technology earlier in the school year to all children.

Overall, a major benefit of this project was the ability to tailor this assessment and intervention to the needs of both Alex and his classroom environment. It can be said that this technology-based intervention benefited Alex, as his post-assessment indicated an increase of 69 percentage points in letter identification and an increase of 55 percentage points in phoneme identification, in spite of no other new forms of instruction being introduced during the intervention period. The outcomes of this project were positive, and the procedure used to reach those outcomes was both easy to follow and easy to implement.

About the Authors

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References

- American Academy of Pediatrics (2013). *Policy statement: Children, adolescents, and the media*. Retrieved from: <http://pediatrics.aappublications.org/content/132/5/958.full>
- Bandura, A. (1989). *Human agency in social cognitive theory*. *American Psychologist*, 44(9), 1175-1184.
- Cheung, A., & Slavin, R.E. (2012). *The Effectiveness of Educational Technology Applications for Enhancing Reading Achievement in K-12 Classrooms: A Meta-Analysis*. Baltimore, MD: Johns Hopkins University, Center for Research and Reform in Education.
- Christenson, S.L., Reschly, A.L., & Wylie, C. (2012). *Handbook of research on student engagement*, Springer Science & Business Media.
- Copple, C. & Bredekamp, S. (2009). *Developmentally appropriate practice in early childhood programs serving children from birth to age 8*. Washington, D.C.: National Association for the Education of Young Children.
- Cullen, M. (2015). How is interactive media changing the way children learn? *Education Technology*. Retrieved from: <http://educationtechnologysolutions.com.au/2015/12/21/how-is-interactive-media-changing-the-way-children-learn/>
- Good, R. H., & Kaminski, R. A. (Eds.). (2007). *Dynamic Indicators of Basic Early Literacy Skills* (6th ed.). Eugene, OR: Institute for the Development of Educational Achievement. Available: <http://dibels.uoregon.edu/>

Goodman, Y.M. (2014). *Observing Children in the Classroom. Making Sense of Learners Making Sense of Written Language: The Selected Works of Kenneth S. Goodman and Yetta M. Goodman*, 197-210.

Kostelnik, M. J., Soderman, A. K., & Whiren, A. P. (2011). *Developmentally appropriate curriculum: Best practices in early childhood education*. Boston, Massachusetts: Pearson

National Association for the Education of Young Children & Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College (2012). Position Statement: Technology and interactive media as tools in early childhood programs servicing children from birth through age 8. Available from http://www.naeyc.org/files/naeyc/PS_technology_WEB.pdf

O'Malley, P., Jenkins, S., Wesley, B., Donehower, C., Rabuck, D., & Lewis, M.E.B. (2013). *Effectiveness of using ipads to build math fluency*, Paper presented at 2013 Council for Exceptional Children Annual Meeting in San Antonio, Texas.

Phillips, D. A., & Shonkoff, J. P. (Eds.). (2000). *From Neurons to Neighborhoods: The Science of Early Childhood Development*. National Academies Press.

Reyes, D. M. (2014). *The effects of ipad apps on student achievement in literacy for children in 2nd and 3rd grade*. Master's Theses and Capstone Projects. Paper 131.

University of Oregon. (2015). *Dynamic indicators of basic literacy skills*. University of Oregon. Retrieved from <https://dibels.uoregon.edu/market/assessment/dibels>

U.S. National Library of Medicine (2013). Screen time and children. U.S. National Library of Medicine. Available from: <https://www.nlm.nih.gov/medlineplus/ency/patientinstructions/000355.htm>