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Neyfy Fernandez  
*California State University, Monterey Bay*

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Primary Education and the Use of Technology

Neyfy Fernandez

California State University Monterey Bay

Abstract

Modern day technology has seeped into homes at an alarming rate in the past decade. Children have access to computer programs, applications, social media and educational programs all at their reach. The classroom isn't immune to this scenario. This senior capstone project explored whether technology is beneficial in the classroom for primary children. Literature reviews and teacher questionnaires from four Gonzales Unified School District teachers were used to answer the question. The results found that social and emotional development was the most vital aspect in the preschool level and when technology was used in the classroom strict screen time guidelines should be adhered and no more than 30 minutes per day allowed. Results in the kindergarten setting were similar in that most children learned to be social even when given technology but still adhering to strict screen time guidelines. Ultimately, the research found that technology does render useful in the classroom, but only if strict screen time guidelines adhered.

*Keywords:* technology, primary age, education, preschool, kindergarten, screen time

## **Primary Education and the Use of Technology**

When I became a mother, I decided to manage my own daycare center. The first year I ran the daycare center, I enrolled eight children age's three to eight and noticed that the school-aged children were interested in using my computer to play games. I wasn't sure if I should allow them to use it, what games were appropriate to play, or if they would be able to understand the proper way of using a computer?

Technology has impacted our society in many ways in the past decade. According to the Committee of Public Education, in 1999, children spent less than 21 hours a week viewing television (1999). The ability to have media and technology in our hands has changed the way families interact with each other and the outside world. The days of having only one television in the home are no more, and most households have a television, tablets, and smart phones at their disposal. A recent CBS News article (2018) reveals that children in 2018 are using more than seven hours a day; drastic change in just a decade. The question then comes have these instruments invaded the classroom? How is technology used in primary education?

Children between the ages of three to five have increased their use of media and technology as a learning device. The hours that children used to play and discover through exploring and manipulation have been less and exchanged for screen time. Many researchers are now questioning the effects of television and media in children. Ultimately questioning; Does using technology at a young age benefit a child?

The research will benefit schools with primary programs, primary educators, and parents. It will especially be of benefit to schools with primary programs because they can base their curriculum around the pros and cons of the technological use in primary aged children.

Educators will also benefit from this information because it will serve as a basis for understanding how technology affects children in the primary ages. Parents will benefit from the information so that they can make educated decisions regarding the use of technology for children of primary ages.

### **Primary and Secondary Research Questions**

The primary research question this paper looks to answer is: *Does using technology at a young age benefit a child?* The secondary questions in this research are: (1) *What type of technology should be used?* (2) *How can classroom concepts be taught by using technology?* (3) *What are the pros and cons of using technology in the classroom?* (4) *How will it affect classroom management?* (5) *How will it affect the students' social development?* The purpose of this paper is to find out if technology use in children age's three to five is beneficial, and if the use of technology would affect their social development, particularly in light that technology use has increased significantly in the last decade.

### **Literature Review**

**Benefits of Technology in a learning environment.** Calvert , Strong, Jacobs, & Conger, 2007 conduct a study of how the television program, Dora the Explorer, influenced Latino/a and White children's learning and if they identified with the character in the show. The first hypothesis was that children would identify most with same-sex models. The second hypothesis was that based on ethnic background, since Dora is a Latino/a character, would the Latino/a children identify most with Dora. The third hypothesis was that children who perceived themselves similar to Dora would learn more about the story and show flexible thinking patterns.

The fourth hypothesis was that children who interact with what was going on in the story would be more engaged than those who just observed the story.

The participants in this study (Calvert et al., 2007) were children three to five years of age which are known as the preschool age. The average age was four years and two months. The children that were studied were Latino/a and White. The children watched a 20 minute episode of Dora the Explorer named Sticky Tape. Dora represents many Latino/a backgrounds. Dora speaks English and Spanish, and has music and food that represent Latino/a backgrounds. The episode included obstacles that needed to be overcome. Dora gave four options to overcome the obstacle. Dora prompts the audience to help her choose the best method to overcome the obstacle. At the end of the episode, Dora thanks the audience for participating.

The researchers used the theory of social learning to examine the impact that watching Dora the Explorer had on preschool aged children. They used four conditions which were control, observation, participation and interaction. Each session was 45 minutes long and the child viewed their version of the episode on a laptop, and answered the questions after they saw the episode. The sessions were videotaped to later assess their engagement and attention.

The results showed that the first hypothesis was true; children would identify most with same-sex models. The second hypothesis proved not to be true; that based on ethnic background, since Dora is a Latino/a character that the Latino/a children would identify most with her. The third hypothesis was proven not true; that children who perceived themselves similar to Dora would learn more about the story and show flexible thinking patterns like Dora does. The fourth hypothesis was true; children who interact with what is going on in the story would be more engaged than those who just observed the story. (Calvert et al., 2007).

In the second study by Mares and Acosta (2008), children watched an episode of Clifford the Big Red Dog. The goal of the study was to see if children comprehend the message of a pro-tolerance television episode. There were three questions explored in this study. The first question asked what children understood to be the moral lesson of the episode. The second questioned which components of the goal-events-outcome-judgment sequence of the story are problematic for young audiences, and which predict their ability to generate or identify the moral lesson. The third question explored whether or not the inclusion of negative content (in this case fear) alters the effect of each component on children's ability to extract the moral lesson.

There were three hypotheses that this study looked at. The first hypothesis was that when asked to describe the moral lesson of the episode, the majority of kindergarteners would fail to generate a moral lesson. The second hypothesis was that when asked to choose an option based on the lesson of the episode they had just watched, kindergarten children would be more likely to choose a familiar but irrelevant moral lesson or a literal summary of the plot than to choose the correct lesson generalized to humans. The third hypothesis was that when asked to choose which of the three television episode descriptions has the same moral lesson as the episode they just watched, kindergarten children would be more likely to choose either an episode with the same characters but different moral lesson, or an episode that reflects a partial generalization of the lesson (be nice to wounded animals), than to choose the complete generalization (be inclusive of people with disabilities).

In this study there were a total of 64 kindergarten children of which 89% were five year olds. The 64 children were randomly selected to watch a 12 minute episode of Clifford the Big

Red Dog titled “A New Friend.” There were two versions of the episodes. One episode was the original and another episode was altered to not show fear. The entire session lasted half hour.

The study used eight measures to gather results. The first measure was the adult comprehension of the moral lesson. The second measure was children’s comprehension of the moral lesson. The third measure was comprehension of events. Children were asked to retell the story. The fourth measure was comprehension of goals. Questions were asked with the goal of seeing how they perceived KC and if they realized that KC just wanted to be accepted. The fifth measure was comprehension of emotion. The final measure was prior exposure.

The researchers used Kohlberg’s theory of moral reasoning which states that children’s reasoning doesn’t allow a child to fully understand moral lessons until they are older. The preconventional stage in children shows learning moral lessons are only seen as right and wrong.

Once the tests were concluded the results of the study showed that the first hypothesis was true that when asked to describe the moral lesson of the episode, the majority of kindergarteners would fail to generate a moral lesson. The children did not fully understand that there was something wrong with the disabled character. They accepted the disabled character as an equal and didn’t see there was a problem. The second hypothesis was also true that when asked to choose which of three options is the lesson of the episode they just watched, kindergarten children would be more likely to choose a familiar but irrelevant moral lesson or a literal summary of the plot than to choose the correct lesson generalized to humans. The children when asked about the moral lesson wanted to give an answer and randomly chose something to say even if it wasn’t relevant. The third hypothesis was again true that when asked to choose which of the three television episode descriptions has the same moral lesson as the episode they



just watched, kindergarten children would be more likely to choose either an episode with the same characters but different moral lesson, or an episode that reflects a partial generalization of the lesson (be nice to wounded animals), than to choose the complete generalization (be inclusive of people with disabilities). Children answered the questions based on the similarity of their basic understanding and could not noticeably connect their decision to a moral dilemma, (Mares, M. L., & Acosta, E. E., 2008 p. 390).

The results of these two studies suggest that the effects on children's learning through media or television can be positive. The researchers in the Dora study (Calvert, et. al., 2007 p. 437), concluded that television did enhance children's learning of study content under certain conditions. They stated that children who saw same-sex role models identified best with their same gender. It didn't matter whether they were Latino/a or White; girls of both ethnicities identified most with Dora. It also showed that by engaging with Dora, both ethnicities learned more about divergent learning. Children were able to learn preschool concepts such as colors, alphabet, numbers and shapes. The researchers also, recommended that given these positive findings regarding learning associated with watching a children's animation, more creators of children's educational programs should be using these models.

Although educational screen time can help children learn many concepts, they have to be concepts at their developmental level. In the study where children watched Clifford (Mares, M. L., & Acosta, E. E., 2008), the researchers concluded that children could not comprehend the lessons on morals in television shows. Children did not have the developmental capacity to understand deep concepts in morality such as the inclusion of children with disabilities. They

concluded that if parent's wanted children to learn these moral lessons that they probably needed to sit with their child as they watched these shows and explain the moral lesson.

The National Association for the Education of Young Children and the Fred Rogers Center for Early Learning ("Technology and Interactive Media", 2012 p.3 ) suggest that the use of technology and interactive media in early childhood programs, for children from birth through age 8, can help young children grow and learn through the opportunity and challenges of using technology and interactive media. This can have an effective use as long as the technology and interactive media is used intentionally and appropriately for the benefit of the child's education.

Many childhood programs in schools, centers, and family childcare agencies use technology and interactive media as a tool to support learning and child development, along with other tools in a setting that is appropriate and has the proper method of use. According to this policy, young children learn better through real world, hands-on experiences and should never use media and technology until the age of 2 years old, keeping in mind that there may be proper uses of technology for young children such as using Skype to connect with family members, looking at digital photos together, co-viewing e-books with an adult, and engaging with interactive age appropriate Apps. The claims that have raised concerns for young children improperly using technology and media are 3D vision and eye health, as well as exposure to electromagnetic fields and radiation from cellular phones, toxins from lead paint and batteries, choking hazards from small parts, screen time, and other psychological or developmental effects according to the World Health Organization's International Research on Cancer (J. Newton, personal communication, May 31, 2011 p. 6).

As young children's minds are developing they are acquiring a sense of initiative and creativity. They become curious about the world around them and use different types of tools and skills to communicate and learn about their surroundings. In optional situations, they use a variety of hands-on materials to learn about their environment including markers, crayons, paints and other art materials, blocks, ethnicity dolls, different types of animal toys, and multi cultural dress up clothes. Allowing them to use media and technology in their developmental setting is another type of outlet that can be used to enhance their creativity and explore learning. The policy suggests that media and technology can be used as an effective tool by choosing age appropriate activities that can enhance the child's learning. Such as allowing children to explore the internet to learn about animals or other educational topics, and learning about new Apps that can help them create something new. They can also look for interactive Apps and tools that can allow children to work together with others, but these activities should be monitored to allow screen time at their developmental age. This method of introducing media use and technology to young children can result in helping them feel empowered as they learn new skills at their own developmental level ("Technology and Interactive Media", 2012 p.7).

In the public policy area of young children and tech use, the use of technology has specified instructions. In order for childhood programs to appropriately use technology and interactive media to help young children's knowledge grow and learn and avoid any psychological or developmental effect of technology use and media exposure, the NAEYC and FRC recommend that age appropriate tools and methods must be used such as monitoring of the usage of technological devices by allowing the children to use tools that are developmentally appropriate for them, helping children explore the internet by co-viewing can appropriate Apps

that can be interactive and easy to navigate, and monitoring age appropriate screen time in order to avoid any psychological or developmental effects.

The author states that the policies presented in addressing the concerns about the use of technology and interactive media exposure in early childhood programs can be an effective tool as long as the educators use skillful methods to help children learn about technology. This can only be truly integrated when the children and the educators focus on the activities and explorations themselves and not on the actual technology (“Technology and Interactive Media”, 2012 p. 9). If guidelines on the use of media and technology with young children are clear, then educators would be able to use media and technology as tools to help young children learn.

The policy provides an effective way for informing the parents-and practitioners working with young children about the potential negative impacts of the technological and interactive media exposure on children’s development. They give good examples of the negative hazards and effects of developmental damage that can occur when technology and interactive media is not used intentionally and appropriately in an early childhood setting. Both parents and practitioners would have a clear understanding of what is helpful and harmful for young children when using technology and media. In this way, both parents and practitioners can adhere to the guidelines in order to avoid harming the development of the young child.

### **Methods and Procedures**

Individual research was done in order to understand the benefits of technology in primary education. Research was conducted with teachers from the Gonzales Unified School District (GUSD) and the literature reviews. Questions were created and provided to four teachers at GUSD.

## **Participants**

A questionnaire was sent out to seven teachers in the Gonzales Unified School District. Four teachers responded out of the seven who were asked. The teachers were broken down by grade level; two Preschool teachers, one TK teacher and one Kindergarten teacher. The same questions were given to all. All teachers were tenured and had been teaching for over 20 years. The participants are identified as one to four for the purpose of this study.

## **Materials & Procedures**

A questionnaire was used to gather the information from the teachers, it was sent via email, and was asked for it to be completed in a timely manner. The questionnaire had seven questions. The questions and responses are in the Appendix. Questions used are labeled Appendix A and questions answered are labeled by teacher number and named Appendix B.

## **Results and Findings**

The findings from the teachers questionnaires and the literature review, revealed about the same results. The benefit of using technology in the primary education environment was positive when used within a 30 minute time period. The secondary questions were also answered.

### *(1) What type of technology should be used?*

Based on the literature review and the answers from the Kindergarten teacher (Teacher #4) who was the only one who used technology in her classroom, the findings showed that the technology that benefits primary children was technology that had a specific interactive component (Calvert et al., 2007). The use of this educational technology was to adhere to strict

screen time monitoring. Both the literature review and the kindergarten teacher used educational technology with primary students less than 30 minutes a day (“Technology and Interactive Media”, 2012 p.3 ).

*(2) How can classroom concepts be taught by using technology?*

Classroom concepts were taught by different technology methods such as cartoon programs such as Dora the Explorer (Calvert et al., 2007), Clifford the Big Red Dog (Mares and Acosta, 2008) and specific educational application that teaches subject matter such as Language Arts. The teachers in the literature review and the GUSD Kindergarten teacher (Teacher #4) were intentional in their use of technology in the classroom. Instruction was given to the students, and technological programs were used to reinforce what was taught by the teacher.

*(3) What are the pros and cons of using technology in the classroom?*

The pros of using technology in the classroom were mainly identified by the literature review and the GUSD Kindergarten teacher (Teacher #4). They felt that as long as the technology was used in an appropriate manner within specific time guidelines of less than 30 minutes a day, it would yield positive benefits for the primary child.

The cons were mainly expressed by the GUSD Preschool teachers (Teacher #1 and #2) and the one GUSD TK teacher (Teacher #3). They intentionally did not use technology in their classroom because they believed that emphasis on developing a child’s social and emotional state was most important in the preschool setting. They believed that using technology would hinder their ability to manage problem solving skills because they would lose the personal interaction with each other.

*(4) How will it affect classroom management?*

Although the GUSD Kindergarten teacher (Teacher #4) observed that the children enjoyed using technology in the classroom, she did have a concern because students at time got bored from using the interactive program. She felt that keeping the children engaged became challenging.

*(5) How will it affect the students' social development?*

In the literature review, it conveyed the message that a student's social development was actually enhanced because of technology in the classroom. The students were more sensitive to other's needs when interacting with their peers who had disabilities (Mares and Acosta, 2008). The GUSD Kindergarten teacher (Teacher #4) indicated that it had not affected her student's social development because the time was under the 30 minute suggested technological time use.

### **Discussion**

The literature review showed that technology use in the primary classroom was beneficial if it was intentional and screen time was less than 30 minutes a day. The literature review also demonstrated that children in a preschool setting also benefited from interactive shows where the main character taught them while seeming like it was a give and take. Teacher #4's answers coincided with what the literature review illustrated that primary children could benefit from technology in the classroom if it was intentional and used as a supplement from the classroom teachings.

Teacher's #1 through #3, felt strongly that a child in the Preschool and TK classroom would not benefit from technology in the classroom. Their points of view were all similar in that the primary child's social and emotional development would be hindered if they only had the

technological item to associate with. For these three teachers, no amount of time used with technology was beneficial for the primary student.

### **Problems and Limitations**

The limitations of this study were that the sample size used to gather research was very narrow. The small sample size was not reflective of all primary teachers in the GUSD. A second problem with this study was that I could not observe the students in the classroom due to COVID-19 school closures. A third limitation was that because of COVID-19, parents were now homeschooling their children and using technology to teach at all ages, yet parents were not surveyed for this study.

### **Recommendations**

After conducting the research on the benefits of technology on primary students, it would be beneficial for all teachers' to go through specific training on the benefits and effects of using age appropriate technology in the classroom. Based on the knowledge gained from the literature review indicating that a decade ago children were exposed to screen time only 12 hours per week in comparison to current times where children are exposed to screen time seven hours a day, it would also benefit the parent's to receive educational material on the affects that large amount of screen time could be detrimental to their primary child.

Along with these recommendations, it would also benefit this study to look at the negative effects of too much sedentary time leading to weight gain. Research should be conducted on the effects that technology isolation would have on children's physical development such as eye-hand coordination, explore in dramatic play, and using large and small



motor skills in comparison to sitting in one place watching television, even when it's engaged material. Research can also be done on parent's use of the educational television as a babysitter, and the non-interaction with people can also lead to decreased social skills.

### **Conclusion**

As media and technology invade homes and methods of learning, it is important to be watchful of their impact on primary education since they are starting their social and emotional development. As has been found through literature review and individual research from GUSD teachers, research has answered the primary question in this study: *Does using technology at a young age benefit a child?* This research has shown that with direct monitoring and specific targets in educational programs children can learn from the use of media and technology. The benefit of interactive technology along with the instruction from the teacher helps the primary child to learn in different learning styles. It is important to train teachers in the benefits of technology in the classroom for primary students and that they are willing to be open to new changes from a decade ago where technology was not seen as having a positive benefit in primary children.

Along with the positive impact of technology on primary children, it is important to implement policy on the use of media and technology and its proper use when working with primary children. The clear guidelines will help parents and practitioners alike to properly use media and technology for the benefit of young children.

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## Appendix A

### Teacher Questionnaire

1. Do you use technology and/or interactive media in your preschool teachings?
  - a. If the answer is yes, continue with the rest of the questions.
  - b. If the answer is no, why don't you use it?

Continue with the following questions ONLY if you answered Yes to question #1.

2. What types of technology and/or interactive media do you use?
3. How much time is given to complete a technological activity?
4. How do you measure what the children have learned?
5. Do you believe this is an effective way for children to learn?
6. How is classroom management affected by technology?
7. Has the children's social development been affected by technology use in the classroom,  
and if so, how?

**Appendix B**

Teacher Questionnaire Responses

Teacher #1

1. Do you use technology and/or interactive media in your preschool teachings?

a. If the answer is yes, continue with the rest of the questions.

b. If the answer is no, why don't you use it?

I personally don't use technology with preschoolers for many reasons, but the most important I think is because we want them to have a strong social development. We want children that can have different skills like cooperation and leadership. We want them to be able to share manage problem solving and interact with other children, and they don't need technology for that.

Continue with the following questions ONLY if you answered Yes to question #1.

2. What types of technology and/or interactive media do you use?

3. How much time is given to complete a technological activity?

4. How do you measure what the children have learned?

5. Do you believe this is an effective way for children to learn?

6. How is classroom management affected by technology?

7. Has the children's social development been affected by technology use in the classroom,  
  
and if so, how?

Teacher #2

1. Do you use technology and/or interactive media in your preschool teachings?
  - a. If the answer is yes, continue with the rest of the questions.
  - b. If the answer is no, why don't you use it?

I do not utilize technology or interactive media in the preschool setting because I believe that children are exposed to technology and media at home often. Most of the children that attend the preschool have access to tablets, phones, or even computers. It is my goal as a teacher to help the children develop their developmental skills, with a high focus on social and emotional skills, by learning from the school setting and the children around them. I believe that children learn and do better with hands-on activities instead of sitting in front of a computer learning on an online program. It may be beneficial for them to utilize technology however for limited amounts a day. If children are given technology at home for extended periods it may be best to provide them hands on, interactive activities to be able to support their thinking by having class discussions and provide equal opportunities among all students. I believe that real experiences and learning from their peers can help them gain new perspectives and tools.

Continue with the following questions ONLY if you answered Yes to question #1.

2. What types of technology and/or interactive media do you use?

3. How much time is given to complete a technological activity?
4. How do you measure what the children have learned?
5. Do you believe this is an effective way for children to learn?
6. How is classroom management affected by technology?
7. Has the children's social development been affected by technology use in the classroom,  
and if so, how?

**Teacher #3**

1. Do you use technology and/or interactive media in your preschool teachings?

yes

- a. If the answer is yes, continue with the rest of the questions.
- b. If the answer is no, why don't you use it?

Continue with the following questions ONLY if you answered Yes to question #1.

2. What types of technology and/or interactive media do you use?

When teaching Transitional Kindergarten, I only used You Tube videos to sing songs to reinforce math concepts in class.

3. How much time is given to complete a technological activity?

didn't do technological activities in TK

4. How do you measure what the children have learned?

NA

5. Do you believe this is an effective way for children to learn?

NA



6. How is classroom management affected by technology?

NA

7. Has the children's social development been affected by technology use in the classroom,

and if so, how?

NA

**Teacher #4**

1. Do you use technology and/or interactive media in your preschool teachings?
  - a. If the answer is yes, continue with the rest of the questions.  
  
YES
  - b. If the answer is no, why don't you use it?

Continue with the following questions ONLY if you answered Yes to question #1.

2. What types of technology and/or interactive media do you use?

Students use iPads in the classroom to do iREADs, which is a Language Arts intervention, which helps students with letter names, sounds, high frequency words, and reading comprehension. I also use YouTube videos to guide writing instruction. For example, each week students learn about a topic and I show them a video on that topic. They then tell me the facts that they learned to complete our idea web on the topic.

3. How much time is given to complete a technological activity?

Students typically log onto their iREADs app on the ipad for 20 minutes a day. Students usually log on 4 times a week so in average 80 minutes per week.

4. How do you measure what the children have learned?

iREADs has a progress monitoring section that lets the teachers view their student's progress. Here is a screenshot of the top of the page:

# Growth

## Progress toward grade level benchmarks



In TK-Kinder students are supposed to be in level A. Once students reach level B that means that they are at a First Grade level.

Key		
<ul style="list-style-type: none"> <li>• Level A correlates to Kindergarten standards</li> <li>• Level B correlates to Grade 1 standards</li> <li>• Level C correlates to Grade 2 standards</li> </ul>	<ul style="list-style-type: none"> <li>— Student placed past this series</li> <li>  Initial Screener Placement</li> <li>! Deferred topic in current series</li> <li>D Student is currently working on deferred topic</li> </ul>	<ul style="list-style-type: none"> <li>■ Above grade level</li> <li>■ On grade level</li> <li>■ Below grade level</li> <li>■ Far below grade level</li> <li>■ End-of-Year Benchmark</li> </ul>

**Using This Data**

**Purpose:** Track students' progress through the program. If students are tracking below grade level, you may want them to spend more time on the software.

Here is a screenshot of the “key”. You can also click on the student’s name to see what they are specifically struggling with. For example students might have trouble with words with the letter sound /w/. iREADs also has a feature called the groupinator that groups students who are in the same levels and you can provide intervention to students in a small group setting.

5. Do you believe this is an effective way for children to learn?

I think that for Kindergarten students, using ipads is a great way to begin their journey towards familiarizing themselves with technology but I don't think that this is enough. It would be great if the school had a computer lab where students could practice using the keypad on a computer or chrome book or using a mouse. I do like the iREADs app because it focuses on important skills that students need, so as an intervention the iREADs app is good but in terms of technology I think that students need more exposure to other types of platforms like computers, chrome books.

6. How is classroom management affected by technology?

I think that students enjoy using technology in the classroom and the classroom management has not been negatively affected. On the other hand, I do notice that the students at times get bored using iREADs so managing to keep them engaged can be challenging.

7. Has the children's social development been affected by technology use in the classroom, and if so, how?

No, I don't think so. Only 20 minutes is allocated to using iREADs and that is just part of their daily routine.