

**Mobile Technology Use in the
Educational Development of Young Children**

MALS 4020 Graduate Research and Writing

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Abstract

Mobile technology devices (such as smartphones and tablet computers) are an increasing part of American lives beginning with our children at birth. This technology is growing faster than any major revolution in the history of mankind, and has the potential to bring major advantages (as well as possible disadvantages) to the educational development of young children. Mobile devices have the potential to become a very important educational tool beginning as young as two years all the way through college and beyond. This report discusses the possibility of using mobile devices for educational purposes with young children both in the home and as part of early childhood education curriculum.

Introduction

Smartphone and tablet use continues to grow by leaps and bounds, and smartphones in particular have “surpassed 50% market share among United States mobile phone users” (Nielsen 2012). This proliferation of mobile technology affects nearly every aspect of daily life, and has a profound effect on the way we can help our children learn. These devices are not only great for getting the latest up to date information; when used properly they can be excellent tools to help in the academic, psychological, emotional, and social development of children. Even young children can “benefit from the use of these devices as part of their early learning curriculum” (Blagojevic 2012).

While some report that using computers have no meaning for children under three (Van Scoter and Ellis 2001), these statements have not been thoroughly evaluated in the very recent post-PC era, where tablet computers and smartphones are so prominent. With intuitive interfaces and apps built specifically for early childhood development, these devices can provide benefits similar to well researched and documented educational computer software (Shifflet et. al. 2012). As with many concepts in life, moderation is the key to using any technology safely and efficiently (Pitzer 2014). If parents are involved in the way that children use mobile technology, it is likely that the overall experience will be beneficial.

While past research of the benefits in using computers for childhood education can be consulted, recent studies reveal that those benefits can be enhanced with mobile devices. Collaboration, sharing and turn taking, and an

increased desire to interact with devices are just some of the benefits these new devices add to educational curriculum.

However, without knowing the best way to employ, monitor, and limit use of these devices, parents risk raising a generation of device-dependent children. It's natural that parents want their children to excel and succeed, so exploring how mobile devices can be used with young children can be very beneficial. By studying the ways in which these devices can best be used, I will show that mobile technology devices are beneficial in the educational development of young children.

Background

Access to mobile devices in the United States has jumped from 52% in 2011 to 75% in 2013 (Rideout 2013). As a result of this high level of availability, children are using mobile devices much more often than in the past, especially with children under age 2 (Rideout 2013). This access is occurring despite the recommendation from the American Academy of Pediatrics "discouraging media use by children younger than two years" (American Academy of Pediatrics 2011). The result of this access is that "smartphones and tablets have become the "go-to" parenting tool of the modern era" (Wartella 2013). Research shows that careful use of smartphones and tablets in education situations can provide tangible benefits to young children.

Arguments that have been made (such as enhanced language and creativity skills) promoting the use of the computers in education (Clements and Sarama 2003) in many ways also apply to tablet and mobile devices. These newer devices have the added benefit of a touch screen, so using them (especially for young children) is much more intuitive than traditional mice and keyboards. As is common

in 21st century life, over use is a concern; however when parents monitor and control usage of tablets & smartphones, real benefits such as cooperation and collaboration can be realized (Shifflet, et. al. 2012).

Classrooms and child play areas at home are filled with toys, many of them educational in nature. Just as books, blocks, and electronic toys can be used for learning, mobile devices should be another tool for development of children, as Wartella states in *Parenting in the Age of Digital Technology: A National Survey*:

Media technologies—both old and new—are among the many different tools in their repertoire that are actively used in parenting practices, whether to occupy, educate, discipline, reward, or calm their children.

(Wartella 2013)

Since we're in the infancy of using mobile devices for early childhood development, recommendations for 'no screen time' from several groups such as the American Academy of Pediatrics (American Academy of Pediatrics 2011) have not been updated. As the National Association for the Education of Young Children and the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College stated in their position statement: "All screens are not created equal". (NAEYC & Fred Rogers Center for Early Learning and Children's Media 2012).

In fact, several pilot programs have shown benefits such as increased cooperation, a desire to explore multiple uses of the device, and enhancing the effect of real-world learning in both the classroom (Shifflet, et. al. 2012; Colorado Department of Education 2014), as well as in the home (Flewitt and Wolfe 2010).

Concerns of over-use of tablets, ergonomic issues, and children preferring an electronic experience over real world activities are worth noting, but when use is properly controlled these risks can be mitigated. Other studies show that mobile devices can definitely be a distraction when parents use them in lieu of interacting with their children (Radesky 2014), but when used appropriately for education purposes, mobile technology is another tool for teaching and learning (NAEYC & Fred Rogers Center 2012).

The positive benefits of using mobile devices can be realized when they are used properly. In fact, engagement with media under the right conditions is active (versus passive), promotes exploration during free play, as well as speaking language, and listening skills (March 2005). A specific area that needs more research is in the interface differences between touch screens and traditional mice & keyboards. Since young children are used to using their hands to grab, touch, and move objects, evidence indicates that using tablets and apps built for touch screen devices is more intuitive (Colorado Department of Education 2014).

The usage of smartphones, tablets, and similar mobile device will continue to rise. Schools are already starting to use these devices in the classroom (Colorado Department of Education 2014), so ensuring young children are familiar with their use will help ensure they're ready to meet digital challenges in the future. Not only do devices promote play, speaking, and listening (March 2005), but with a plethora of apps available, it's much easier to find something that meets the needs of individual children. Unlike standard books and educational toys, the mobile device can be immediately and almost infinitely adapted to serve the purpose at hand.

These benefits cannot be overlooked and are worth the small risk of 'too much screen time' with young children.

Analysis

Since smartphones have surpassed 50% penetration among all households in the United States (Nielsen 2012) and the use of mobile devices is up to 72% of adults as of 2013 (Rideout 2013), it's clear that young children will have access and the ability to use these devices on a regular basis. Some guidance "discourages media use by children under two years of age" (American Academy of Pediatrics 2011), while others attempt to make a distinction between the function and purpose of different screens. A screen that is used to learn colors, shapes, or numbers is completely different than a "passive screen such as watching cartoons on a TV" (NAEYC & Fred Rogers Center for Early Learning and Children's Media 2012).

While overuse of technology is a concern for all age levels (Newman 2012), moderation is the key to ensuring that technology use by young children enhances their development. Some studies have shown that parents can easily become distracted with technology while spending time with children (Radesky 2014); however, this type of behavior does not represent educational use of mobile devices with children. In her study, March found that "many parents believe mobile devices have a place in modern educational curriculum" (Marsh 2005), so it makes sense that these devices should be used in classrooms as well as at home. In their national survey, "Parenting in the Digital Age", researchers from Northwestern University discovered that smartphones and "tablets have become the 'go to' parenting

tool”, even though many parents do not believe parenting is easier due to mobile devices (Wartella 2013). These devices are used for keeping children busy, calming, or rewarding them, and even getting them ready for bed (Wartella 2013). Yet this same survey shows that smartphones or iPads are currently used only 10% of the time by parents looking for an educational activity for children under 8 (Wartella 2013). Reasons for this preference were not investigated, but it’s clear that books are still the primary education tool used by parents with young children (Wartella 2013).

Early learning curriculum is varied in both methods and tools. Pre-K, Montessori, and Head-Start programs all have various ways to teach basic skills such as color recognition, numbers, letters, and shapes to children under 4 years (Klein 2014). The way young children learn fits perfectly with mobile devices, since mobile devices can behave in ways similar to real-world toys yet are more adaptable to specific needs of the child.

When using tablet computers in her pre-school classroom, educator Cassandra Mattoon noticed several interesting results (Shifflet et. al. 2012). First, unlike some studies showing that computer use by children can cause isolation (Cordes and Miller 2000), in her classroom tablet use increased cooperation (Shifflet, et. al. 2012). By taking turns drawing portions of a scene, “children naturally collaborated on the project and presented what they did together”, without prompting from the teacher (Shifflet, et. al. 2012)

“Since all children learn in different ways and at different rates” (Hernandez 2014), the ability to change to a more appropriate app on a mobile device is much easier than with a traditional educational toy. For example, if a child becomes bored with a traditional letter-puzzle, he or she may not have another choice to continue learning, however having a mobile device makes changing focus as easy as switching applications. Some children prefer flashcards, some prefer matching, while others learn better through an interactive story. All of these methods are available on a single mobile device, versus several educational toys that would otherwise be purchased, stored, and eventually lost or broken.

Since young children are curious by nature, the idea of experimenting with tablet applications to determine what is possible comes completely natural. In their study, “A Tablet Computer for Young Children? Exploring Its Viability for Early Childhood Education”, Couse and Chen found that 3 to 6-year-olds quickly learned to use the tablet computer and that even though errors in using the software increased, correct responses also increased due to experimentation (Couse and Chen 2010). Being able to experiment with different apps and ‘self-guide’ through learning activities helps children explore the information they find most interesting with little or no adult guidance required.

Experimentation with suitable educational apps can have positive outcomes, however some devices are ‘always’ connected to the Internet.

Mobile technology that has full-time access to the open Internet can lead to undesirable consequences, so its use must be tightly controlled. Using these devices in an appropriate manner means not using technology just because it is available (NAEYC & Fred Rogers Center for Early Learning and Children's Media 2012). Additionally, parents and teachers should always be present when young children are learning with these devices; this will not only help with questions on using the devices, "but will also help ensure that maximum benefit is gained from this usage" (Marsh, et. al. 2005). Activities performed on mobile devices should be educationally sound and developmentally appropriate (NAEYC & Fred Rogers Center for Early Learning and Children's Media. 2012), so while learning numbers, colors, or shapes on a device is a good use, spending hours on YouTube is not generally an educational use and falls within the discouraged APP definition of 'screen time' (American Academy of Pediatrics 2011).

Some argue that introducing a new 'toy' as high-tech as a mobile computing device may serve as a distraction from 'real' learning tools (Sana et. al. 2013); however, under carefully controlled circumstances, children are quick to understand the difference between digital and real-life objects. In Ms. Mattoon's classroom, children were excited to learn about how cookies are made using an app on a tablet, but realized that if they wanted to eat the cookies, they would have to make them in real life (Shifflet, et. al. 2012). In most studies I've reviewed, use of these devices is carefully

controlled and they're used for a specific purpose (Shifflet et. al. 2012, Flewitt and Wolfe 2010, Colorado Department of Education 2014).

Ultimately, it's up to parents and/or educators to set good usage patterns (such as limited time with digital devices and using only apps that are appropriate for a specific educational task) for these devices (Wartella 2013).

While mobile and tablet learning are still in their infancy, information gained from past research on using computers in education is being used to show how these new devices can be an effective tool in early childhood development. Computer Aided Instruction (CAI) has been well documented since personal computers became widely available in the late 1980's (Clements and Sarama 2003). More recently, Flewitt and Wolfe (In their study published in the Cambridge Journal of Education) showed how computer use enhanced collaborative and problem solving skills (Flewitt and Wolfe 2010). Using an interactive computer for learning also serves as a great motivator; in the Flewitt and Wolfe study, one of the twins was much more motivated to learn in the afternoon when using a touch screen computer (Flewitt and Wolfe 2010), a time when she normally wasn't interested in learning.

The wide variety of applications available on many tablet devices (Hernandez 2014) results in the ability to use the devices for nearly any educational purpose. Using mobile devices in a group environment also

promotes exploration during free play, speaking and language skills, as well as listening (March 2005). Based on the excitement young children show when interacting with mobile devices, they are more interested in exploring their use than with many traditional educational toys. The full extent of benefits that can be gained from mobile devices are just beginning to be fully understood, and much more research should be conducted to pinpoint specific benefits and risks.

Some schools are already experimenting with using tablets in early childhood education. In iPad trials conducted at the Thompson Early Learning center in Colorado, after only one year of use the tablet computers added significantly to the EDC curriculum. In both large and small group settings, iPads have helped bring standard lessons to life due to their interactivity (Colorado Department of Education 2014). In one class, the ability to combine real-life vegetables with a tablet based vocabulary activity showed the children how vegetables can be used for many different things, while giving them the opportunity to experiment with real-life objects (Colorado Department of Education 2014). Additionally, educators were able to use the device as a motivator as well as tool for learning. Children had a chance to do work on the tablet, and then play a game on the same device as a reward (Colorado Department of Education 2014). Lastly, students who studied English as a second language (ESL) also benefited with specialized

bilingual apps (such as flashcards and games) that help them learn new language skills.

Conclusion

With the availability of smartphones and tablet computers throughout our country, their use as additional educational tools for our young children is a smart move for both parents and educators. Historical studies regarding the uses of standard computers in education have shown benefits that are enhanced by the use of these new, more interactive devices.

Teachers and educational planners should be embracing the carefully controlled use of these devices as way to reach new levels of interactivity in their curriculum. For parents of very young children, the use of smartphones and tablets for educational purposes in the home can create exciting learning opportunities for children as young as two years. Parental guidance and examples of good usage patterns are essential to realizing maximum benefit from these devices while minimizing associated risks.

Overall it's clear that smartphones and tablet computers can be excellent tools for education. Interactive devices are more fun for toddlers, provide an interface that's easy to learn and explore, and introduce our youngest citizens to the next revolution in learning and productivity.

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