

# The iPad and Preschool Children with Learning Difficulties

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## Abstract

Preschool children learn through exploration of their environment, and a review of the research literature has revealed that learning can be enhanced through exploration that also includes the use of digital technologies. Although research can be found illustrating the use of computer assisted instruction to enhance learning with preschool children, research on the use of touch screen tablets with this population is just beginning to emerge. These devices offer the possibility of exploration in a new way, with ease of interaction on the touch screen, thousands of early learning applications, engaging multimedia capabilities, and reasonable cost. They have great potential as an early learning digital tool. However, little information exists on how this potential can be utilized effectively with young children with learning difficulties. The focus of this study was to look at the use of early learning applications loaded on the iPad, one of the touch tablets available, by preschool children with learning difficulties. The study also examined the applications that the children and parents chose to use, parent perceptions of the use of the iPad by the child, parent/child interactions while using the iPad, and the supports that parents and families needed to use the iPad effectively.

## Keywords

iPad, apps, early childhood, learning difficulties, special needs, preschool

## **Introduction**

Young children naturally learn about their environment through play and exploration, and digital technology tools offer opportunities to extend this exploration in new and innovative ways. Over the past decade, a growing number of interactive games and educational software packages have been implemented in early childhood education (Wang et al 1), and the computer has become a recognized tool in the education of young children (Nikolopoulou 173). There may also be distinct advantages in the use of digital technology for young children with disabilities. The use of digital technologies may help to stimulate interest in learning and support active exploration for children who are less able to explore the environment, or learn in typical ways because of their disability (Primavera, Wiederlight and DiGiacomo 6). Preschool children with disabilities may have a huge need for technology for learning, communication, and play. Yet their exposure to suitable technology for play and learning may be limited due to a lack of access to appropriate technology tools.

A number of studies in the literature have indicated that the use of computer technologies with young children can be beneficial and can provide children with an opportunity to learn and practice skills in an engaging and interactive environment. Roschell, Pea, Hoadley, Gordin, and Means (92) found that the use of computer based technologies can be very simulating and motivating for young children. Hitchcock and Noonan (145) found that computer assisted instruction of early academic skills was successful in improving skills. Johnson, Perry and Shamir (209) looked at the skills of 180 preschool and kindergarten children and reported that the children demonstrated positive changes in skills when using computer-assisted instruction. Li and Atkins (1715) reported that early computer exposure during preschool years was associated with the development of concepts and cognition.

Although there is some research in the literature regarding the use of various computer and assistive technologies with young children, there is no information regarding the use of the iPad with young children with disabilities. A search of several databases, including ERIC, revealed no results using the terms “early childhood,” “iPad/iPad2,” “preschool,” and “disabilities.” The literature available on the use of the iPad appears to largely be limited to papers describing the technology and its capabilities, descriptions of the administrative or practical uses at postsecondary level, and a few pilot studies in grades K to 12. The iPad offers a means of learning and interacting in new ways that have not been previously explored (Valstad and Rydland 9). The iPad, with its ease of interaction on the touch screen with multi touch finger gesture controls, thousands of applications from which to choose, engaging multimedia capabilities, and reasonable cost, has great potential as an early learning digital tool. However, little information exists on how this potential can be utilized effectively with young children with disabilities. The focus of this study was to look at the use of early learning applications loaded on the iPad by preschool children with mild to moderate learning difficulties. The study also examined the applications that the children and parents chose to use, parent perceptions of the use of the iPad by the child, parent/child interactions while using the iPad, and the supports that parents and families needed to use the iPad effectively.

## **Discussion**

This was an exploratory study on the use of the iPad for early learning with 6 preschoolers between the ages of 3 and 5 with mild to moderate learning difficulties, who were receiving support from a rural community organization in Alberta, Canada. The learning difficulties experienced by these children differed from child to child, and included speech and language delays, fine and gross motor problems, difficulties with social skills development,

attention deficits, and behavioral issues. Once the children were identified by the community organization, the researcher contacted each family to see if they would agree to participate in the study. The parents and staff member who worked with the child in the community organization were interviewed prior to the commencement of the study to identify the child's strengths and weaknesses. The parent and staff members' current use and familiarity with technology was explored, as well as their perspective on the use of the iPad in early learning. The parents were also asked to keep a journal regarding their child's use of the iPad. Following a brief introduction to the device by the researcher, each child received an iPad to use at home for a 6 week period. Each iPad was loaded with a number of early learning applications that addressed a range of early learning opportunities including early literacy, early math, interactive story books, puzzles, coloring, drawing, tracing letters, and a number of interactive cause and effect games. Observations of the child were also conducted as the child received the iPad and completed the initial app activities. The data collection at the completion of the study included a post interview with the parents, a document filled out by the parent identifying the apps the child used, and observations of the child using the iPad and their favorite apps.

A number of positive results were noted across the children. None of the children in the study had difficulties learning how to navigate with this tool. During the initial activities with the researcher, the majority of the children were able to learn how to effectively use appropriate touch for navigation on the iPad. Two of the children had not quite mastered the touch in 20 minutes, but with prompting and one or two more sessions to practice with their parent, were able to use the tool. Over the course of the research, all of the parents reported that the children used the iPad independently and did not require help to find the apps that they wanted to use, or

to use the apps. In fact, the parents reported that the children insisted on using the iPad independently and were able to do so.

All of the parents in the study reported that the apps on the iPad completely captured their child's attention. They found that their child was engaged for extended periods of time and often practiced tasks over and over. Even skills such as tracing and coloring seemed to capture their child's interest, although the children typically would not be interested in tasks like this. The majority of the parents reported that their children had learned a number of preschool skills during the 6 week period that they used the iPads. A much unexpected result was that 5 out of 6 of the parents reported that their child had acquired printing skills through using tracing applications. Although it is not possible in this kind of a study to totally attribute this skill acquisition to the use of tracing apps on the iPad, all of the parents indicated that their child found the tracing applications to be particularly interesting and engaging and that their child was very interested in practicing letter formation over and over again independently. A number of other areas of growth were also identified by the parents. One child learned to count to 30 on a favorite early math application. Several of the children learned to print their name and had even generalized the skills to printing their name on paper with a pencil. Several children had progressed to completing puzzles on apps that were considerably more difficult than what they were able to complete at the beginning of the study. One parent commented that he was certain that his child was "thinking faster" while engaged in problem solving apps.

A number of positive outcomes were identified that are related to the parents of the preschool children. None of the parents in the study reported that they needed any training and support to use this technology. The parents were all interested in having their child use this tool. They were all comfortable using the iPad and having their child use the iPad.

Several drawbacks were reported by the parents during the research. Many of the parents felt that their child liked to spend too much time using the apps on the iPad. Despite the fact that the children appeared to be engaged in the activities and learning, several parents reported a need to monitor the time spent on the iPad and to balance the child's day with other kinds of activities. It was also noted that one of the children in this study abandoned the learning activities on the iPad to play games with no cognitive demands on other technologies available in the household.

### **Conclusion**

Overall, the results of this exploratory study were very positive. Even though the study was conducted with only 6 preschool children with learning difficulties, each of the children was able to use the apps on the iPad independently. The cognitive threshold for use of a technology has been substantially lowered on the iPad. Even young children with learning difficulties can master the navigation very quickly. This tool provides access to technology for children with disabilities who might not be able to access other types of technology without support. It provides preschool children with the opportunity to play and learn without adult direction and allows them have control over their own learning experience once the apps are loaded on the iPad by an educator or parent.

As discussed above, the parents reported that the children were very engaged with the learning apps on the iPad. For children with learning difficulties, who often get disenfranchised from the learning process even at an early age, access to applications to work on preschool skills may help to keep them more actively interested and engaged. Even more importantly, for preschool children with significant attention problems, for whom learning in traditional ways is very challenging, the engaging multimedia on the iPad may provide the stimulus to keep them engaged in learning for longer periods of time.

All of the parents reported that the children demonstrated gains in their learning in one or more areas. Several of the children made gains in learning in areas they would not normally be interested in practicing. This may be due to the fact that they are very engaged in the learning activities and are able to practice the same tasks over and over again until they are mastered. The multimedia apps also reinforce learning as they often have obvious reinforcement for correct responses built into the app, and they engage the child through a variety of auditory, visual, and tactile feedback.

The iPad is a valued mainstream technology, and there is no stigma involved in its use for children with learning difficulties or their families. The desirability of the iPad may reduce typical technology abandonment issues that occur when complex assistive technologies are introduced into the home for children with learning difficulties. The iPad is simple to use and very engaging. Several of the families were considering buying an iPad for their child at the end of the research. They saw many positive outcomes occur through the use of the iPad during the research, and the cost was within the family budget. This willingness of the families to purchase mobile technology for their child may help eliminate funding issues, which can be a significant barrier to access technology. These parents were also very willing to purchase apps that would support their child. They have the ability to access these apps and can afford them. They do not need a professional, school, or program to buy apps for their child. However, the parents do need information as to what apps are suitable for their child's developmental level and interests, and they want to purchase quality apps.

There are drawbacks to the use of the iPad with preschool children. One drawback is that the child may want to spend more time playing and exploring on the iPad than the parent would like. This drawback could be addressed by the parents, by designating a certain amount of time

for the child to have access to the iPad each day or week. Visual reminders of when this time will occur and how long it will be would help the child plan and anticipate access. It is also important to choose the apps for the iPad carefully. The apps should match the child's developmental level, but also provide options to extend skills to a more advanced level. The preschool children in this study particularly liked playing with interactive learning games, but given a choice some children will choose games that do not require thinking or cognitive engagement.

This exploratory study is the first of a number of studies aimed at examining the use of the iPad with preschool children with disabilities and focused on preschool children with learning difficulties. Due to the very limited scope of the study and the small number of preschool children involved, there is not yet sufficient evidence to determine the best practices of the use of this tool with this population. However, given the positive results that this study produced, the use of this device as an early learning tool for children with learning difficulties should be explored further. In addition, it would be interesting to explore further whether the study outcomes were the result of the design of the learning applications used, or the simple touch interaction of the screen that is likely most suited to this population.

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