iPod Touch for Literacy

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Abstract
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iPod Touch for Literacy
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Supervised by

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This study examined the benefits of using an iPod Touch with literacy learners. Research was conducted in the households of four early elementary students as they used an iPod Touch for recreational and literacy activities. Data was collected through interviews, pre- and post-testing, and video analysis of student interaction with the iPod Touch. The findings showed the students were capable of independently using the iPod Touch and were engaged when using it. In order to access the educational potential of the iPod Touch, educators must understand that it is a tool which requires carefully and conscientiously software selection based on solid learning theory.
iPod Touch for Literacy

Touch screen technology is part of the growing digital media industry. Children are now using technology well beyond the desk computers of ten years ago, much in part to the iPod products which have given rise to terms such as the "iPod Generation" (Dale & Pymm, 2009). The iPod Touch is a small mobile digital device developed by Apple. The iPod Touch has Wi-Fi internet capacity, which enables its users to connect to the internet on the go. Another significant feature of the iPod Touch is the way that it is operated; in addition to internal gyroscopes, which allow users to tilt the device as a control method, the iPod Touch is operated primarily through touching the screen. Users can zoom in with a pinch on the screen or flip between pages with a flick of a finger (Apple, 2010). Touch screen technologies offer interesting and new ways to support instruction, utilize multiple intelligences, and help students learn the skills necessary in an ever increasingly digital world. The iPod Touch and its software can provide many valuable resources to both teachers and students. New generation iPod's are increasingly interactive, providing more than just music or video and have interactive software, games, activities that provide a range of multimodal ways to interact with technology. The technology can provide an excellent tool for out of school learning for students and suggests possibilities for distance learning. iPods Touches are one way of integrating the use new technologies for literacy education. By not exploring the benefits of new technology to support diverse instruction, teachers may lose out on a valuable instruction tool. With younger generations increasing use of many digital media formats, failure to develop curriculum involving these new formats may leave students inadequately prepared for literacy in the 21st century.

This study involved four early elementary students who were observed as they used the iPod Touch for both recreational and for literacy learning objectives. Each individual
participated in interviews, pre- and post-testing, and their interactions with the iPod Touch were recorded on video for observation and analysis. The examination of this data was used to understand the benefits of using the iPod Touch for technology integration into the classroom. My research suggests that the iPod Touch, with its novel touch-screen and tilt input, is a new technology tool that children at the early elementary level are able to use. The multimodal methods of interaction that are possible provided by this device can be engaging for students as they use it for recreation and for education tasks. Lastly, this exploration of the iPod Touch suggests that as a tool for literacy development it cannot be used independent of classroom or other means of guided instruction.

**Theoretical Framework**

**Sociocultural Theory**

In order to further explore the iPod as a beneficial tool of literacy education, it is important to clarify how literacy is learned and how the iPod touch, as a new technology, is imbedded into literacy theories. The Sociocultural theory of language acquisition states that children are active members of a constantly changing community and that language knowledge is not only learned, but the ongoing process of its learning adds to and changes the community culture as well (Kucer, 2009). To be active members of a community, the Sociocultural theory describes that children must understand and learn to use language functionally as well as socially. In the 21st century, functionality is increasingly requiring the use of digital products at home, in school, at the work place, and the community as a whole. The iPod Touch and other related devices are a significant part of the culture in the United States today and are being used in more and more settings. Children are growing up immersed in an iPod rich environment.
Goodman (2001) emphasizes that children's development of literacy will expand in ways that are directly attributable to their experiences and the views and attitudes the encounter within their social groups. The use of iPod products by these social groups will contribute to the background experience and create comprehension strategies that children develop for literacy events (Goodman, 2001).

For literacy learners who are still developing their use of language and forming their literacy skills, literacy knowledge is constructed through the tools that teachers and students use in and out of school (Larson & Marsh, 2005). Extending the use of iPod Touch for literacy purposes will build on children's at-home discourses. At-home discourses are what Gee (2001) would consider primary discourses, defined as socio-cultural ways we communicate with intimates, such as immediate family members. By building on the literacy skills that children are involved with in the home, Gee (2001) suggests we will provide opportunities for concurrent learning and acquisition in the school. The iPod Touch, with its ability to connect to the internet and interactive touch screen for input, is a social tool and an artifact which transforms both the designers and users, and can become part of the classroom social learning process (Larson & Marsh, 2005). Use of an iPod Touch will provide students an opportunity for continued practice of already developing technological literacy skills. It will also enable children to be active members of their classroom, school, and home communities and emphasizes their roles in a community of learners, constructing and constructed by larger cultural systems (Larson & Marsh, 2005).
New Literacies and Technology Theory

The changes in literacy practices are not only social but involve operating and use of the new technologies as well. With the increasing use of new technologies, a second theory, the New Literacies and Technology theory, must be recognized and taken into account when understanding and defining how literacy is learned and used in both a functional and social manner. The prevalence of the iPod Generation is a clear example of how new technologies have impacted the way people communicate, listen to music, watch videos, read, and play games. Its design and interface involve reading skills that extend far beyond being able to read a sentence in a book or turning a page. The New Literacies and Technology theory address the ability to decode, encode, and make meaning of a range of modes of communication mediated by new technologies (Larson & Marsh, 2005). Larson and Marsh (2005) claim that as children become more competent using digital technologies at a young age, attention by educators must be spent towards utilizing these skills; if these skills are not used, educators risk creating a dissonance between the home and school experiences. The New Literacies theory also helps explain why using new technology is essential. Larson and Marsh (2005) explain that a gap between in- and out-of school technology experiences may result in current technology learning practices appearing tame, and lead to disaffection.

The New Literacies and Technology theory, in addition to recognizing new literacy practices that result from new technologies, provides a framework for educators to integrate technology into the classroom. Larson and Marsh (2005) discuss that traditional roles of teachers are changing to include being a resource manager, and learning and developing the skills to analyze and produce lessons with new technologies is becoming more important. They also posit that teachers must become co constructors of knowledge. Products like the iPod Touch provide a
way to integrate student technology skills with pedagogical practice. Larson and Marsh (2005) argue that teachers must not only use technology, they must be better trained, and build confidence in their skill to use new technologies, to transform traditional teaching, not merely replace blackboards with white boards and websites for worksheets.

By combining these two theories, it is understood that literacy is an active social construction of a meaning based system for communication that is multimodal in its expression, reception and understanding. Exploring the benefits of the iPod as an interactive teaching tool shows how it may support the active involvement of students in the development process as language learners, providing a medium, as they learn, test, and modify their understandings. New technologies are now involved in the modification of language learners understandings and contribution to the knowledge base of their cultural community and is increasingly significant as the new technologies require new literacy skills to operate and navigate through home, school, and global communications. In terms of this research, the iPod Touch will be explored as tool that can provide active engagement for young language learners. It will also be explored as a means of technology integration, assisting instruction as an option for extending learning beyond the classroom walls.

**Research Question**

Literacy is a social practice and unfolding new technologies change how reading and writing function in our society. This action research, in seeking to answer how new digital touch screen technologies, such as iPod Touch, be used to support literacy, asks the following questions: What benefits does the iPod Touch present for literacy instruction? Are young
learners able to use touch screen devices effectively?; and How do students feel about using the iPod Touch for learning?

**Literature Review**

**Introduction**

Computers and mobile technologies are one of the latest in a long line of technological advances that are changing literacy practices and requiring the development of new literacy skills. This literature review discusses current research related to the use of technology for educational purposes. Following a brief historical account of technology in education, the research addresses the strengths and weaknesses of using an iPod Touch for literacy education. Due to the recent development of the iPod Touch, the research is addressed in several themes which incorporates significant features of the iPod Touch and combines research on mobile learning tools and interactive learning tools.

**History of Technology in the Schools and New Literacies Theory**

The use of technological devices in schools can be traced back long before the advent of digital and electronic devices. The research presented in my study of iPod Touches examines the recent development of mobile computing devices. New technologies have changed education since the clay tablet, the pencil, the pen, and many other technologies. Baron (1999) illustrates however that not all new developments are immediately accepted. The attachment of an eraser to a pencil was contrary to a no crossing out policy, yet almost all pencils now have erasers (Baron, 1999). Similar to the eraser on a pencil, it is now widely accepted and expected that technology is an integral part of education in the United States. Technological development has been
important in education ever since the clay tablet and is now a distinct focus in K-12 curriculum. (Cheek, D., 1997) Cheek (1997) identifies that textbooks from the 19th century contained large portions devoted to technology achievements and notes that the focus on technology continues on into today's school, listing the science, technology, and society movement, The International Technology and Engineering Educators Association, and the International Conference on Technology and Education. Additionally, in today's classrooms, learning standards now target technology instruction. These standards have been produced by groups such as the American Association for Advancement of Science and the National Science Teachers Association, who help identify what our school graduates should know and be able to do with technology. (Cheek, 1997) Technology is used with many ages and grade levels and national standards have been incorporated into the New York State Department of Education Technology Education Framework, which states that schools must help to create a technologically literate society (NYSED.gov, 2010).

The history of technology education pertinent to this research study delves primarily into communication and computer based technologies and how they have become facets of our daily life. Communication devices such as the television, radio, and phone have seen continual development since they were first released and have effects on our literacy practices. The television, for example, provides a communication medium that includes audio and visual signals, which represents a significant change in how we encode, transmit and decode messages from the pre-television era. (Deal, 2008) Modern communication has become wedded to computer based technology in many ways. In addition to written communication like email, computers can be used similar to a phone in order to talk to people in far places, or even transmit both sound and video to talk to people face to face over the internet through video conferencing.
programs such as Skype. In education this communication has seen use in online courses, video pen pals (Rumpler, 2007), discussion forums (Swan et al. 2007), and email communications. Communication through the computer also allows the transmission of knowledge and resources. The internet has played a major part in computers prevalence as the worlds database of information, graphics, and streaming video, making it an invaluable resource for educators. Lankshear and Knobel (2003) discuss that changes have occurred in the manner which literacy is used by technology, school, media and the economy. They continue, commenting on this change as part as a move towards global scale communication and manufacture and that these changes impact social practices in all aspects of everyday life. Access to the internet through computers has enabled both teachers and students ways to access and share all types of information (Kervin, 2005) on as many subjects as can be imagined. Digital media and mobile communication systems have played a large part in creating a culture of ubiquitous computing. Not only is the presence of computers and the internet increasing, but the applications which they may be used for are growing, leading to the potential for paradigm change (Swan, Van T’ Hooft, Kratcoski & Schenker, 2007). The change in literacy patterns is in agreement with New Literacy Studies, and with much of the current literature reviewed here, which asserts that it is becoming necessary for teachers to account for changing literacy practices required by our new technology (Davidson, 2009; Hull & Katz, 2006; Shenton & Pagett, 2007). Swan et al. (2007) provides an example of a specific difference between classic literacy skills and technology based literacy skills, such as hypertext, which have been shown to alter traditional linear reading. Therefore, as educators who wish to help students develop as members of a technologically literate society teachers must account for changing technologies in our teaching practice. Teachers are responsible for teaching beyond decoding and basic "how to" skills so that students are able to successfully navigate new
technologies and these new means of communication. One such example of new technology and new interactive skills that are required is the advent of the iPod Touch which was released in 2007 (Apple, 2010). This device combines touch-screen technology with the mobility of other communications technology and represents a distinct possibility for providing new, creative, and interactive learning opportunities for literacy learners.

**Touch screen technology and Interactive Learning**

An even newer form of technology, the touch-screen device is an innovative technology quickly growing in popularity. A touch-screen allows users to operate the device through manually applying fingers to the screen, which reacts to the touch by performing functions depending on programming and user operation. In this way, touch-screens enable greater ability to interact with digital devices. For example, in order for users to select something on a screen they may tap it, or drag it with their finger. Users can zoom, enlarge, surf the internet, operate programs and play games all with their hands on a screen. The touch screen devices that are presented in this review of literature are namely the Interactive White Board (IWB) and the iPod Touch. Each operates using different touch-screen technology. Interactive White Boards use a resistive touch-screen; when touched, the screen will report the resistance where it is touched as means of input and will elicit some reaction (Deal, 2008). In contrast, the iPod Touch uses capacitive touch-screen technologies which creates a small electrical connection when the screen is touched for input into the device (Deal, 2008).

The interactive properties of these new technologies will enable teachers to more effectively integrate technology into their daily practice. The IWB is examined in the studies of Wood and Ashfield (2008), Bennett and Lockyer (2008), and Haldane (2007). The IWB is large
touch-sensitive boards that allow teachers and students, to manipulate, create, and distribute electronic teaching and learning resources (Bennet & Lockyer, 2008). The IWB is connected to a computer in a classroom and will display what the computer displays instead of, or in addition to, the standard monitor. In the classroom it can be used as a monitor for watching videos, it can be used for computer demonstrations, and it can be used interactively with teachers or students operating programs via the wall mounted touch-screen. Some white boards also come with an electronic a stylus, for writing, based on the same touch-screen principles. Connected to the internet, the whiteboard may also be used to surf the web, view videos, read online, and find additional teaching materials and resources.

The digital whiteboard itself however, is not interactive; it is only a tool. The user chooses whether or not to take full advantage of the interactive capabilities (Haldane, 2007). In analysis of their data, collected through observation and interview over a two year period, Haldane (2007) asks three questions which provide a framework for analyzing interactive learning: “Who is interacting with who (or what), how are they interacting, and what is the effect” (p. 263)? Haldane (2007) discusses the term causal interdependency to describe the elaboration of interactive learning threads as interactions with the lesson that spark a further interaction. In analyzing videos of lessons, Haldane (2007) used micro-analysis of interactive use of the white board to determine how causal interdependency adds to the student development of understanding through accumulation of numerous small points throughout the lesson. One portion of the data that Haldane (2007) discusses entails a literacy interaction where the class is involved in a Cloze activity. When a student is working at the board and struggles to produce a solution, not only was the student engaged with the IWB, but the class was engaged as well. Students were observed in their body language, such as counting on fingers, and faces set with
concentration showing their ongoing engagement with the IWB (Haldane, 2007). The described learning moment also displays how the whiteboard was used interactively to provide the student with an opportunity to complete a Cloze activity on the board. This study helps understand that the iPod Touch can be considered a literacy learning tool that extends beyond what it can offer simply as functional device. Teachers can incorporate technology to support a meaningful learning experience and can extend beyond the student going up to the board, which is only one form of interaction that a touch-screen can provide.

Jewitt, Moss, and Cardini (2007) discuss different methods of interactivity: technical, physical, and conceptual, which can be mediated by the teacher’s planning the use of an IWB. Jewitt et al. (2007) identifies technical interactivity as the focus on interacting with technical aspects of the board; physical interactivity, which involves having students going to the front of the room and interacting with the board; and conceptual interactivity, where the focus is on interacting with, exploring and constructing curriculum concepts and ideas (p.312). The inclusion of multimodality, the pace, and the amount of interaction that a teacher interjects into a lesson was found to have profound effects on how students use and perceive interactive touch-screen devices. Jewitt et al. (2007) identify that 75% of the teachers in the study designed their own lessons using the IWB; 45% used lessons made by other teachers and 42% used lessons derived from commercially designed sources. This identifies that teachers have many choices as to how IWBs are used in the classroom. The study uses three lessons from their observation to illustrate the findings of how teachers make instruction interactive. The three examples are all math based lessons. The first involved a teacher who did no electronic preparation and used the IWB to handwriting formulas and for diagrammatic drawing. In this lesson students remained in their seats except for a few who were invited to do some equations on the board towards the end
of the lesson. The second teacher instructed from the front of the class, using the IWB to present slides with formulas, flip charts, diagrams, hyperlinks, graphs, and tables. The teacher involved students intermittently throughout the lesson, inviting students for short interactions with the board. The last example presented in the study involved a teacher who prepared materials for students to interact with the board and taught from the back of the class. The students were instructed to make use of the prepared interactive slides throughout the lesson. The first two lessons highlight that traditional teaching can and does continue and uses IWB as glorified blackboards. All student interactions with the board, in the first two examples, are based on close-ended questions and demonstrates technical interactivity. The third lesson involves students co-constructing knowledge through discussion and dialogue. Students used the IWB to explore the contents of the lesson, which was designed by the teacher to be used as an open-ended prompt and resource for exploration. While all the examples used the IWB as a display device, it was the open-ended lesson which provided the most interactive experience for the students. The Jewitt, Moss, Cardini (2007) study emphasizes the teachers role in using interactive devices for learning. Lesson design can result in traditional teacher lead activities, or it can be used as a resource to involve students in the active use and manipulation of touch-screen devices.

Interactive learning is a pedagogical method that can be greatly enhanced by the use of an Interactive Whiteboards. This section of the literature review will identify current research establishing a range of resources the IWB can provide for teachers and students, and interactive learning made available with this technology. The use of IWB for the purpose of this literature review is as a representation of how touch-screen devices can be used to promote interactive learning experiences with students.
Although interactivity is a goal with IWB use in schools, it is still primarily seen only in teacher led instructions and is often used merely as an electronic blackboard (Shenton, & Pagett, 2007; Jewitt, Moss, & Cardini, 2007; Lewin, Somekh & Steadman, 2008; Wood & Ashfield, 2007). Shenton and Pagett (2008) reinforce this fact as they discuss interview responses regarding student interaction with the whiteboard is mentioned primarily as physical interactivity – children using the pen on the board, writing some text, or solving a problem on the board. Touch-screens, in this way, are not automatically interactive; in fact, the whiteboard can also be used for direct teaching, such as modeling, lecturing, and direct instruction (Wood & Ashfield, 2007). At the same time, direct instruction does not prevent interactive learning in all cases. Bennet and Lockyer (2008) found that teachers in their study used the IWB with the students by sharing control of the board and having students participate in activities involving the IWB, such as using internet search engines. In order for touch-screen technology to be increasingly interactive, as in the third example in Jewitt et al. (2007), it will be necessary for teachers to receive more training in both use of the technology and in interactive teaching pedagogy. This will also apply to the iPod Touch because, aside from size, it can serve many functions that and IWB can.

Educators have been quick to establish that IWBs provide multimodal tools which can be used for addressing the needs of learners. The adoption and use of the IWB has received enthusiastic response from teachers and has been used across curriculum subjects. Lewin et al. (2008) found examples of pedagogical change with the use of the IWB, citing that some teachers develop entirely new ways of teaching and use new skills when they involve the IWB in their classrooms. Throughout the two years of this study, teachers extended their understanding and implementation of interactive lesson for students and began to utilize learning resources in new
manner that were mediated by the use of the whiteboard. It is important to note that the changing practices were improvements on previous practices and were often not possible until the IWB was supplied to the class (Lewin et al. 2008). The presence of the whiteboard and its technology opened a new avenue of teacher resources that were not available prior to its arrival.

Bennett and Lockyer (2008) qualitatively studied the use of IWB in four primary school classrooms and similarly found that IWB was primarily used to support literacy and math skills and for providing immediate practical benefits such as resources found via the internet. The research of Wood and Ashfield (2008) adds to the argument of the IWB as a valuable resource in the classroom. Teachers in the study reported that IWBs supported good visual resources and had a range of software and digital resources to support their instruction. This is important, since the resource material and software is selected to enhance and support teaching for active engagement, the full potential of technology to active student thinking and learning is realized (Wood & Ashfield, 2008). The positive view that teachers take of IWBs and other internet capable devices as a resource is encouraging in that it will help maintain positive perceptions of technology for the classroom. Combined with resource possibilities, the education programs available on the IWB, and vicariously the iPod touch, make the iPod Touch a device that has effective classroom and mobile learning applications.

The positive attitude of teachers towards technology integration is important for effective implementation. Gorder (2008) and Yuen and Ma (2008) further explore teacher perceptions of using technology in the classroom. Yuen and Ma (2008) surveyed teachers using a technology acceptance model. The effect of perceived usefulness and perceived ease of use are determined by the researchers to be fundamental determinants of teacher acceptance of technology. However they found that perceived ease of use and computer self-efficacy, when combined, strongly
correlated with intention to use computer technology. Yuen and Ma (2008), conclude that developing a school environment that supports technology use will provide hands on experience for teachers that goes beyond additional training and creates a safe-zone for teachers to experiment with technology in their classrooms. Gorder (2008) went further and observed teachers with access to technology rich sources. The results of the study found that teachers used technology for productivity and for delivering instruction but did not fully integrate technology (Gorder, 2008). The study also found that the individual teacher is the prime factor for determining successful technology integration. Gorder's (2008) suggestions to improve technology integration are very similar to those suggested by Yuen and Ma (2008) and include increased training and professional development as well as creating an environment where teachers can practice, reflect and share.

It is also important to listen to student voices about technology integration and learning with technology (Levin & Wadmany, 2006). Levin and Wadmany (2006) studied the relationship between student views on learning with information technology and teachers’ beliefs of using information technology in the classroom. The study was a three year case study which used qualitative analysis to evaluate student and teacher questionnaires, interviews, and classroom observation. Results revealed that students’ learning environment and education views became aligned with constructivist thinking (Levin & Wadmany, 2006). Students emphasized processes and consequences of learning with new technologies that incorporated social interaction and interpersonal support. Students viewed information technology as a learning tool and a medium to negotiate meaning through collaboration (Levin & Wadmany, 2006). However, due to different teaching styles, students responded differently to technology integration had different views of how technology can affect learning, showing that teacher beliefs and practices
influenced student conceptions and attitudes toward technology (Levin & Wadmany, 2006). The effect of teachers’ beliefs and practices of technology integration on student learning underlines the importance of the activity, the context, and the culture in which it occurs (Levin & Wadmany, 2006).

The current research pertaining to IWBs helps to guide understanding for the possible use of an iPod Touch in literacy education. Like the whiteboard, an iPod Touch has a touch screen that can be utilized for multimodal presentation. Similar to the whiteboard, the iPod Touch can involve educational games and activities at differing levels of interactivity. It is also important to understand that teacher training and familiarity with use of the iPod touch will increase teacher self-efficacy in the same fashion as the IWB. Combined with access to a plethora of resources and communications tools via the World Wide Web, its small size and portability the iPod Touch is a candidate for a successful technology tool.

**Mobile Learning**

Mobile learning has a basis in communication technologies. The internet and mobile devices combined are providing new and meaningful education possibilities that harness the social aspect and portability of mobile technologies. A significant feature of iPods and other portable communication devices is the ease with which you can transport them. The iPod specifically has many different options starting with just a music player at the low end, and moving to a high-end touch-sensitive product that can play music, surf the web, record music and videos, take pictures, and play videos. The crucial aspects of mobile technology, namely their size and constant communication possibilities, will enable teachers to extend learning beyond the classroom walls. These characteristics allow for ease of transport and ease allows the
device to extend learning outside of the classroom. The research articles here will address education through digital communication and then educational Podcasting. While the research addresses iPod music and video players, the iPod Touch has both of those capabilities in addition to the interactive touch-screen.

Lam and Rosario-Ramos (2009) studied the use of digital media by immigrant teens in the United States as an important out of school social tool. Surveying 262 students about their use of digital media, they found that 72% of the students used the internet to communicate across borders. The study also found that the students used multiple avenues to communicate, such as instant messaging, E-mail, chat rooms, websites, and blogs. The study emphasizes how students’ digital literacy practices allowed them to learn and maintain other languages, as well as build on development of multiple perspectives due to their exposure to transnational media and social relations (Lam & Rosario-Ramos, 2009). It is important to note that Jailett (2004) also mentions the use of the same communications tools in a French study. Even though Jailett (2004) cites these as impediments to instruction, both studies demonstrate that computer and mobile communication are prevalent. Jailett (2004) sought to show that communication technology provided for student use received low amounts of educational use. Jailett (2004) addressed the improper use of technology, in the form of digital communication, by comparing test groups with control groups. The three test schools were provided with portable computers for their fourth-year students. Through surveys, internet usage logs, and observation Jailett (2004) found that students in the test group who were supplied with the portable computing devices frequently used electronic messaging such as emailing, sending 50.8 emails per week compared to the control group who sent 5.7 emails per week. Additionally, half the students in the test group replied to the surveys that they frequently used the internet to search for information, videos, and
music not relating to their school work. The contrast between Jailetts' findings that students are distracted by technology and the findings of Lam and Rosario-Ramos (2009) is that the latter study examined the positive social uses of students and communications technology. By coding students’ non-school work as distracting, Jailett (2009) fails to appreciate the social skills and technical skills that the students learn through this kind of exploration. These two studies show that student interest and ability to use computers in a social manner is, and can be, utilized as a positive motivational factor for their use by students as a way of learning. The development and popularity of the iPod Touch and the iPhone (a similar device that also transmits via phone company digital transmission in addition to Wi-Fi) represent that digital devices are becoming more popular and that students are shifting away from desktop computers and land-based telephones.

Swan et al. (2007) discusses the work of the students in their studies at the AT&T Classroom, which is equipped with access to desktop and wireless laptop computers for each individual student. This study looked at whether or not a computing environment could support individual and social construction of knowledge. Eight teachers participated in the study and brought their students to the AT&T Classroom for a half day every six weeks. Students used the technology provided to complete tasks such as completing KWL charts, digital photography, audio recording, concept mapping software, and other computer software in their learning. Teacher participants who were interviewed as part of the Swan et al. (2007) study noted that their classes were easier to manage at the AT&T setting than when in their normal classroom. The teacher also noted students were more engaged and spent four times as much time working on student centered activities than in their normal classroom. There are several reasons why the students may have been easier to manage at the AT&T classroom, the first reason being that the
students were in an unfamiliar location. A second reason could be the degree to which students were motivated and engaged by the increase in student-centered activities.

Bauleke and Herrmann (2010) note that iPods, another form of digital computing, can be used in a manner that will engage students and in effect, fight boredom. Teacher participants in the research had students connect the songs they like to important aspects of books they were reading. Student work also included an analysis of the song and an explanation of its connection to the scene from the books. They found that the use of iPod, in this manner, did result in quicker development in understanding of the themes. The development and popularity of the iPod Touch and the iPhone (similar device that also transmits via phone company digital transmission in addition to the Wi-Fi) represent that digital devices are still popular for students and show a shift away from desktop computers and land-based telephones.

Earlier, the streamline effect of touch-screen technology was mentioned as helping in the reduction of mobile device size, while at the same time increasing their capabilities. Power and Thomas (2007) seek to establish that handheld devices provide greater ease of use over desktop computers, especially in regard to rural communities. Hand devices that were made available to the research participants in this study were reviewed as excellent resource tools and offered anytime anyplace opportunities for use. As a result of the known usefulness of the handheld products, 85% of the teachers involved in the study used handheld devices over desktop computers. Although the teachers in the study recognized the possibilities provided by the handhelds, the teachers’ reflections indicated several stages of acceptance. Power and Thomas (2007) noted that initially teachers felt “lost” with the handhelds and took about six months to adjust to the new hardware and software. The next phase saw teachers recognizing the possibilities provided by the mobile devices for administrative tasks. Power and Thomas (2007)
identify phase three as a period when teachers began to find creative ways way for learners to use the hand held computers. That it took time and involved a process for teachers to become used to and begin exploring the use of hand held computers also reinforces that technology education is critical to creating and providing learning environments with technology. The importance of teacher education with mobile technologies will serve to support stronger classroom practice through equipping teachers for use of the technologies already available to them and help them explore new digital and mobile learning possibilities.

Rumpler (2007) discusses the positive effects of using mobile technology through the use of podcasts on iPod devices. Rumpler (2007) studied how Podcasting was introduced to support student science lessons. After finding information from many sources the students in the podcast group of 5th and 6th grade students compiled their information into an audio reports that would be available on the school intranet (Rumpler, 2007). Students were motivated by being able to share their work and teachers were pleased by the ease of use. Mobile technology helps students to share their work with others and communicate more effectively as well as motivate students, and support the development and use of mobile learning to extend education. The social motivations of students was also found by Lee (2009) when iPods and blogs were used in a social manner to promote intercultural exchange between Spanish and American students. The project used blogs and podcasts to exchange information with Spanish counter parts. Students reacted favorably to the use of communications technology as part of their course and found the experience both rewarding and fulfilling (Lee, 2009). In particular, the students appreciated the way that communications technology facilitated the use of and transformed students’ views about cross cultural learning. The students continued to be engaged and eagerly participated in the use of communications technology with Spanish students. Students felt that writing blogs
helped them to have control over their own writing. The use of programs like *iMovie* and *Audacity* enabled the students to add videos, pictures and music which, like the student studied by Rumpler (2007), they enjoyed being able to share with others. These two studies show that mobile learning projects can be motivational, allowing students greater control of literacy events such as Podcasts, and programs like *iMovie*, and sharing their work on the school intranet. It is important that mobile technologies are motivating for students. The inception of the iPod Touch as a medium for mobile learning weds popular touch-screen technology with literacy and other learning possibilities.

Stockwell (2007) also states that importance of mobile technology and that mobile learning will become more of an integral part of language learning. Vess (2006) agrees with this stating that iPods, also tools of mobile technology, are one of the best selling gadgets on the market. The Stockwell (2007) study used a designed intelligent language system for vocabulary assignments that could either be completed on a computer or by a cell phone. It is important to note that the use of intelligent language systems, which Stockwell (2007) defines as "an effective tool in language learning environments" (p. 368), would also be supported by Vess (2006). Vess (2006) demonstrates that mobile learning and iPods can increase student achievement when based on solid learning theory. However the study found that mobile phones were not used as frequently as the computer for learning vocabulary. Although Vess (2006) seeks to support mobile learning, the study revealed some flaws in using mobile phones for literacy instruction. Some problems that resulted from trying to use cell phones were overage charges, small screens, and lack of reception. Stockwell (2007) concludes that this study suggests the potential for intelligent mobile-based systems for teaching but has not attained that in the study. Fitting in with the growing prevalence of technology and technological advances, Stockwell (2007) asserts
that this may cause phone-based internet prices to drop making mobile-phone based educational programs more accessible. These studies support the use of mobile devices such as iPods provided that the programs and applications that are selected are done so with a concern for solid learning theory.

**iPod and Learning Theories**

The New Literacies and Technology theory and the Sociocultural theory overlap in several ways which pertain using an iPod Touch in education. As active members of a changing community students are learning from multiple sources including home, school, and an ever increasing global community. To be active members a child must learn how to use language both functionally and socially. This process is increasingly involving the use of new technologies and is requiring new skills to operate in the current age. Mobile devices such as the iPod Touch are providing new and meaningful educational possibilities through the many capabilities it provides.

Mobile devices such as cellular phones have been shown as a New Literacy method of closing the divide between home and school. Kervin (2005) discusses how technology can be used to strengthen and support home-school communication. In the study, Kervin (2005) explores the use of mobile phones for students to share in-school learning with parents via text and picture messages. Sixth year students in the study used a cell phone located in the classroom to communicate short text messages, emails, and multimedia messages. Data from Kervin's (2005) study shows that students found mobile phone communication as a valuable resource in the classroom for providing accountability, immediate contact with family, and stimulating dialogue with family members about school. Both parents and students identified the use of
mobile phones as technology that they understood (Kervin, 2005). By using the mobile phone as a social link between the students and their families the cellular phone was able to promote student learning by increasing motivation. Student understanding of the cellular phone as a valuable resource also serves for students to increase their own new literacy skills. Kervin (2005) mentions that in some instances, through exploration, students uncovered new features and ways to use the cellular phone. As language learners, exposure to literacy events through differing mediums and technologies provides opportunities for active engagement as we seek to understand and use new devices. The exploration of new technologies, such as the iPod Touch, represent resources and offer innovative new educational possibilities.

A combination of New Literacies is seen in extending the social use of computers for communication and literacy outside of the schools. Hull and Katz (2006) explore how two students go beyond traditional oral and written expression and use multiple media for forming and representing an agentive self. At the Digital Underground Story Telling for Youth center in Oakland, two individual case studies were analyzed to determine how digital media can be used for the creation and expression of an agentive self. The study found that the male participant used multimedia (poetry, music, image) as an expression of self through digital story telling (Hull & Katz, 2006). His digital story, two minutes in length, narrates a movie, performs a poem and compliments the piece with digital images demonstrating a digitally rich interweaving of symbolic and semiotic systems (Hull & Katz). The second case study participant, used multimedia to digitally author herself into stories with characters that align with her personality (Hull & Katz, 2006). An important role that this study demonstrates is that traditional forms of social expression such photography, poetry, and the written word are being subsumed, adapted, and merged using computers. It is important that weighty social constructions, such as creating
and representing oneself are being expressed digitally. The students in Rumpler (2007) are reported to have increased motivation when they have the option of publishing their work to the school intranet. This is important in terms of producing digital media (digital story telling in this case) for social interaction. The drive and motivation for this ability is supportable by the iPod touch. The iPod Touch can be used to capture video, pictures and sounds and can support creating, receiving, or sharing a digitally rich social atmosphere.

Method

Context

The research for this study took place at the home locations of four students in central New York. One of the participating children is an only child and the other two participants are siblings. The study atmosphere of the first child is at a home located near downtown Belle City (pseudonym). The two story house is located in a lower income area of town; the outside of houses in the neighborhood appear uniformly dilapidated. The inside of the house is well kept and clean. It includes many modern technologies, including a flat screen television, laptop computer, and video game consoles. The second study location will take place at a rural home in nearby Freeburg (pseudonym), where the second and third participating students reside. The second house is two stories and appears to be well kept, inside and out. The house is also used for a small childcare service, including dramatic play areas and writing/drawing tables. It also includes many forms of household technology appliances, including a flat screen television, and desktop and laptop computers. The fourth and final participant lives in a section of Belle City that is primarily tenanted by students attending a nearby college. The apartment is two stories, and the study took place in the downstairs kitchen. The living room nearby contains a large flat
screen television with dvd player and home theatre speakers. Other technologies reported to be in the home by the participants but not present during the study are a laptop and an iPod.

**Participants**

The participants for the study were from across a range of early elementary levels including pre-kindergarten, kindergarten and a first grade student. The first student, Lalandra (all name are pseudonyms) is five years old and the only child in her household. She lives with both her parents in their downtown Belle City house and began pre-school in the Fall of 2010. Lalandra is of mixed Asian-Caucasian descent and comes from a lower income working class family. Her parents report that she hasn't begun to read at the time of this study, but can read her own name and uses learning based games at the household in addition to school. The second and third participants are female siblings who are six and seven years old respectively. The six year old, Cherri, began kindergarten and the seven year old, Anastasia, began first grade in the Fall of 2010. Both Cherri and Anastasia are Caucasian and hail from an upper middle class household. Anastasia reads at a 1st grade level and Cherri is only able to read and write her name. The fourth study participant is Harvey who is four years old and began preschool during the Fall of 2010. He is an only child, of Caucasian descent, and lives alone with his mother. Harvey is unable to read, spell or write his name at this time. At this time their experience with technology is unknown; however, it is known that all participants have access to televisions and computers.

**Researcher Stance**

I am currently a graduate student at St. John Fisher College. I am working on obtaining a Master’s Degree in Literacy Education and have a bachelor’s degree in Early Childhood
Education. I have met all four students prior to the beginning of the study through social ties to their parents. I have also worked with Anastasia conducting practice observation survey assessments for school projects. During the course of this action research I acted as a participant observer, which Mills (2011) defines as observation as well as engagement in activities and providing information. This will have effects on how the children interact with the iPod Touch, providing an opportunity for assistance in its use, and may also affect program selection.

**Research Method**

This qualitative study is designed to examine the use of the iPod Touch for literacy activities with elementary age students. It specifically examines the user accessibility of the iPod Touch and how much prompting and guiding is necessary for students' use of this technology. The research will be conducted over two sessions, each approximately 45 minutes in length. The first session will consist of an initial interview, pretest, mini-lesson on navigating the iPod Touch interface, and an opportunity for students to practice using this device. The second sessions will involve literacy based practice exercises and a post-test conducted on the iPod touch, as well as the post-interview.

During the first session, an interview will be conducted with both the participants and their parents. These interviews will take approximately ten minutes, will be audio-recorded and transcribed, and consist of seven questions (see appendix A for interview protocol). The questions will ask parents and student about the students' prior experience using technology in the home and at school, as well as their prior knowledge of iPod Touch or other touch-screen devices. Following the initial interview, the student will be asked to complete a grade level paper based spelling test consisting of words that will be found in the iPod Touch applications. The
Conclusion of the first session will consist of a guided mini-lesson on how to use the iPod Touch and an opportunity for the student to use the device; this part of the first session will be video recorded. For the purpose of this session the applications used will be literacy games that are not associated with the second session, including single-player games (e.g. tilt snake), and multiplayer games (e.g. tic-tac-toe).

The second session will be completely recorded by video. This session will begin with a ten minute period allowing the children to review use of the iPod Touch through applications other than those used for the rest of the session. Following this, the students will be guided to the literacy applications that have been selected for this research (e.g. Meghan's Flashcards, Meghan's Matching Game, and Meghan's Spelling Quiz). Each of the applications has a set for preschool, kindergarten, and first grade words that will be used for the individual participants at these levels. Student scores for Meghan's Spelling Quiz will be saved; this test is equivalent to the paper based pre-test and therefore will be useful for direct comparison during data analysis. Lastly students will participate in a five minute one-on-one interview with the researcher about how they perceive the iPod Touch for both recreation and learning.

**Quality and Credibility of the Research**

The quality and credibility in the process of this research is very important. Mills (2011) states that credibility is the researcher's ability to take into account the complexities that arise during the study and deal with patterns that are not easily explained. To provide credibility for this study I will triangulate my information by collecting data from multiple sources. By using observation data, interviewing, and collecting artifacts and video for analysis, triangulation will
be used, which Mills (2011) argues provides credibility through enabling comparison of data for cross-checking data.

I made sure that my research is transferable and dependable. Transferability is identified as the researchers' belief that everything they study is context bound as not to develop statements that can be generalized to larger groups (Mills, 2011). Using video recording in addition to field notes will provide me with descriptive multi-modal data, and would enable detailed comparison to other possible contexts. iPod Touch applications that will be use for this research are also publicly available for evaluation and comparison by other researchers. Dependability refers to the stability of the data (Mills, 2011). I will overlap my method of data collection using both interview as well as observation to inform my analysis. For additional dependability I will establish an audit trail, creating reviewable data in the form of audio and video recordings, and original field notes.

Lastly confirmability of the data, which Mills (2011) defines as neutral and objective data, is ensured by the practice of triangulation. This has previously been discussed as the use of several differing methods of data collection which can be used for comparison and cross-checking.

Informed Consent and Protecting the Rights of the Participants

Before beginning the research process, informed consent will be collected to protect the rights of participants. Due to the young age of the participants, parental permissions forms and verbal assent from children will be used to obtain authorization to perform my research. The attitudes and reactions of the students involved will be observed and respected as well. Confidentiality was guaranteed to protect the rights of the students. All participants and parents
will be informed that all names included in the study will be changed to pseudonyms to protect their anonymity. Additionally, all recordings, transcripts, and student work will be kept in private location by the researcher and will not be used without authorization of the parents.

**Data Collection**

Data will be collected in multiple forms during this research over the course of two sessions. All participants and at least one parent of each child were interviewed for approximately ten minutes to understand students' previous use and background knowledge of technology. This interview will be recorded and transcribed. Students will be asked to complete a written exercise, which will require use of the same words that will be used by the iPod Touch applications, prior to using the iPod Touch. Student abilities will also be measured by the iPod Touch applications, which provides student performance statistics. Students will be observed and video recorded during their interactions with the iPod Touch. Field notes will also be kept throughout both sessions for an additional source of information. Lastly the students will participate in a one-on-one follow-up in interview, which will also be recorded and transcribed. The follow up interview should take no more than ten minutes and will discuss how students perceived use of the iPod.

**Findings and Discussion**

Through careful examination and analysis of the data collected through my research, three themes emerged. These themes were found consistently throughout the data and present possible advantages and disadvantages of using an iPod Touch for instruction. The themes
include the following: student engagement, the usability of the iPod Touch and the programs, and the educational potential of the device.

**Student Engagement**

The first theme that was identified from the research was that the iPod Touch was an engaging device for the children to use. This theme is evident primarily through the observation portion of the research. Student engagement with the iPod Touch as an interactive device is a theme that is also identified in the review of literature. Wood and Ashfield (2008) and Jewitt et al. (2007) discuss that technology can be used as a valuable resource to support active engagement and as a multimodal tool which also promotes engagement. (Lewin et al., 2008) The ability of the iPod Touch, through integrating technology, can be used to promote student engagement and is evident throughout my own research on this topic. The analysis of student engagement is based upon student visual focus, and time spent playing each game/program, and periods of interaction with the iPod touch.

The majority of my research that can be utilized for the discussion of student engagement comes from the observation and video analysis. Each of the participants was observed in their home as they interacted with the iPod Touch. These environments included many opportunities for distractions, such as visiting relatives at Lalandra's house, or an active baby, and cooking dinner at Cherri and Anastasia's home. However, during their time using the iPod Touch, all the participants’ attention was maintained on the iPod Touch. For the most part, the children also maintained constant interaction with the iPod Touch, using their fingers to constantly operate the programs they selected. An example of this is when Harvey sat quietly playing games for a period of three minutes without interruption. A stronger case of student engagement is presented
by Lalandra's use of the iPod. As an active and energetic child, Lalandra is usually very social and bounces around between activities. During her time with the iPod, however, Lalandra stayed sitting throughout the duration of the observation and focused on her interactions with the iPod. This engagement was made more evident through an excerpt of the video analysis of Cherri. Throughout a majority of her time using the iPod touch her eyes were glued to the screen. However, while Cherri used the flashcard program, Meghans WordFlash, her attention wandered. The Meghans WordFlash application on the iPod Touch is a leveled literacy program which displays words on the screen and reads them aloud so the students can repeat them back. Cherri began looking around the room and playing with other items at the table where she was sitting while using the Meghans WordFlash. These observations of extended visual focus lead me to believe that the iPod is definitely an engaging source for the children's visual attention. However, the example of Cherri's wandering attention to the iPod during the use of one program, as well as the children's frequent switching between and selection of new programs also suggest the need to address student engagement in terms of the activities offered on the iPod Touch for this research. Cherri's wandering focus of attention shows that technology is engaging but only if the software can hold the users attention. Another example from my research that supports the finding that technology is engaging only if it can hold the students attention, is that Harvey also veered away from software with minimal interactions or displayed material in a manner above his reading ability. Haldane (2007) states that technology is only engaging when software is selected appropriately by the teacher to promote engagement. Using technology, as shown by my research does not guarantee engagement.

Although the participants all maintained their visual focus on the iPod Touch, they frequently switched between different programs. The observations were on average 23 minutes
in length. During the observations the children switched between games multiple times. The switching between multiple games allowed me to begin interpolation as to why children switched between the games and identify program features such as the level and manner of instruction, the type of interaction required, and the ability of the children to interact with the iPod Touch independently. The participants were observed to switch activities between four and ten times throughout the observation. Some activities were played for less than two minutes. Some of these selected programs were played for less than a few minutes while others were played a majority of the time. The observation data leads me to believe that programs that were interactive and easy to learn or use received more play time than the others. The program that was played for a majority of time by Lalandra, Harvey, and Cherri was Dora program. The Dora program is created by a popular trade series that is found on television, in games, and books. The Dora program entailed a lot of student manipulation of the touch screen or tilting of the iPod for student interaction. The Dora program consists of two activities. The first activity is a coloring activity in which users can choose a color then select a portion of a colorless pictures to color. The second activity consists of a racing type game where users tilt the iPod Touch to have the character move left or right. Additionally the Dora program provides verbal and visual instructions on how to operate the activities. The popularity of the Dora program is connected to student engagement because at least some of the participants mention that they have had previous interest or experience with Dora. Cherri responds to an interview question that she has played "Dora" games before on the computer (initial interview, November 1, 2010) and Lalandra requested to play the Dora game in the initial interview. Additionally the Dora program utilizes verbal and visual instructions to inform users how to operate the game. This advantage is mirrored in the Super Why literacy game which both Cherri and Anastasia utilized for a period
of time as well. The Super Why application on the iPod Touch provides four different types of literacy activities; spelling, fill in the blank for passages, rhyming and a letter hunt. Each of the four activities provides verbal instruction and clues, which correlate with the graphically displayed choices for the children to select as answers. Harvey, Lalandra, Anastasia, and Cherri were all able to use the program without any assistance from the observer, including the use of the iPod tilt function without observer instruction after listening to the program explain what to do. Students using the Dora activities were also able to navigate easily between the two games. For example, Cherri was able to easily switch between the coloring and the racing portion of the game without instruction from the observer. The students frequent use of the Dora game leads me to believe that the program was popular for several reasons; the popularity of the Dora series, the manner of instruction helped the students to be able to use the program more easily, and the manner in which children interacted with the iPod Touch and the Dora programs was engaging.

Other programs that children selected were selected infrequently and the duration the children used them was also small in comparison to the Dora programs. One example of a game that was quickly switched from was the SpongeBob SquarePants Marbles and Slides game. It is important to note that SpongeBob SquarePants is also a popular trade series, however this game was played by only one child, Harvey, and for a very short duration. The SpongeBob game gives written instructions to users directing them to maneuver marbles to an exit. The SpongeBob program requires that users tilt and interact with the screen drawing lines and tapping buttons to effect the marbles. Through observing Harvey's interactions with the game I feel the reason that the SpongeBob SquarePants program activities for the SpongeBob SquarePants game provided no verbal instruction, instead each game, and the steps to get to the game required numerous readings of small text boxes. During the use of the SpongeBob SquarePants program Harvey
needed constant assistance and had the instructions read to him, and requested help operating the

game. Consequently, when given the option Harvey quickly closes the program and finds a new

one. A second example of students non-engagement was mentioned when Cherri’s visual

attention wandered and she began playing with items on the desk. The program she was involved

with was flashcards and only required the student to repeat the words said aloud. The major

differences between SpongeBob and the Meghans Wordflash to other games, such as Dora,

highlight areas that are general across the programs selected by the children. The difference

between games that provide verbal instruction and those did not did, affected how long students

used a game, with the former being used longer and more frequently. The difference of manner

of instruction provided and how it affects student engagement is seen when Harvey used the

SpongeBob SquarePants game, which relied only on text instruction, for less than a minute

before switching to a new activity. While verbal instruction provided by the game did have an

effect on students game selection the type of interactivity involved in the activities also seems to

have an effect as well.

Although the Meghans WordFlash activity provides verbal instructions, Cherri’s attention

wanders. Through observation of Cherri and the other participants, I am lead to believe this may

be due to the type of engagement offered. The word flash activity does not engage the student

beyond repeated the words. The lack of engagement is dissimilar to many of the other games that

were provided. Most of the games require the children to interact with the screen using their

fingers to color and manipulate objects on the screen. This manipulation of the screen is popular

with all the students, who throughout the observations are seen to be tapping, sliding, circling,

and tilting the iPod. These games, such as Angry Birds, and Cut the Rope are seen to be

interesting and engaging to the children, such as Harvey who quickly moves from games such as
Zoo Memory, which only requires a minimal amount of interaction (only flipping boxes over). Angry Birds is a game that requires Harvey to aim birds and shoot them at obstacles using a slingshot. Cut the Rope is a puzzle application that involves maneuvering a piece of candy attached to string to the end point through cutting different strings in a planned out manner. The type of interaction required affecting student engagement is also reinforced by the use of Super Why by Anastasia and Cherri. Both girls chose and played Super Why games for a matter of minutes. This activity provides both verbal instruction as well as frequent need to manipulate the screen to complete the activities. The amount of manipulation contrasts with Meghans WordFlash, requiring only repetition of words, during which Cherri’s attention wandered.

Interviews with the students also lead me to conclude that interaction is important, Anastasia discusses that she likes using the iPod Touch because "you can touch it" (Post-Interview, November 1, 2010). Harvey and Lalandra both mention that being able to operate the devices in their homes such as music players, televisions, and radios is part of their at-home technology interaction. Harvey replies that he uses "the remote" to operate the television and Lalandra points to herself, when responding to questions about who operates the television in their house. (Initial Interview, October 30, 2010) The observations show that students are consistently focused on the iPod during its use and that their engagement is modified by how easy it is for them to learn how to use the activities as well as the type of interaction required. These interactions contribute to what Haldane (2007) discusses as causal interdependency, which describes the elaboration of interactive learning threads as interactions with the lesson that spark a further interaction. The selection of software programs that rely on interactions of touch, seeing, and hearing, that the participants can access, provides multimodal experiences for the children which Jewitt et al. (2007) claims have profound effects on how students use and perceive technology. The
engagement offered by the iPod Touch that is seen in my research demonstrates that an iPod Touch can be relied on as a medium for presenting educational programs in that it is very multimodal.

**Usability of the iPod Touch**

The students’ abilities to use the iPod touch were demonstrated through the observation and video analysis. The ability to use the iPod independently was measured by the amount of assistance the students required to use the activities. Each student was provided with a quick demonstration on how to use the iPod Touch by touching the screen as well as how to return to the program selection menu. Additionally the students were monitored on how they used were able to use the iPod.

The first portion of usability to be examined related to the manner in which instructions were given to the students which was mentioned in the engagement section of the discussion and findings. Some of the iPod programs utilized both verbal and visual instructions. The verbal and visual activity instruction enabled all four participants to interact with the Dora activities with little or no assistance from the observer. Programs without these aspects required more assistance, and in some cases required constant one-on-one explanation, such as with Harvey and the SpongeBob SquarePants program. With the text only instruction, it was necessary for me to read every instruction as well as demonstrate each function as well. Another program which did not provide instruction was the MarbleMash game. The MarblesMash game has users hold the iPod horizontally and tilt the device so digital marbles will roll on the screen in the direction of the tilt. The goal in MarbleMash is to maneuver the marble around obstacles and holes to an end point. The lack of instruction required Anastasia to ask for assistance when figuring out how to
use the program, which required tilting the iPod to play. What this demonstrates is that not all programs enable independent use of the iPod. That not all software supports or enables independent student use of the iPod reinforces what was found in the review of literature by Jewitt, et al. (2007), that simply using technology does not guarantee successful use and that it is up to the teacher to choose games that students are able to use.

In addition to programs providing instruction, the manner in which the iPod was handled by the students spoke volumes about the usability of the iPod touch for education. The iPod programs required a variety of interactions such as cutting a rope in Cut the Rope or using a slingshot in Angry Birds. Other programs such as Dora and MarbleMash required the participants to pick up the iPod and tilt it to control the activity. Anastasia was able to successfully use MarbleMash by tilting the iPod, and all three of the other participants were able to use the tilt for directing Dora and selected this game multiple times. In all cases, the children had no difficulty using the touch screen; however as they used the iPod Touch they grew more comfortable using it. Lalandra was the only child to have used an iPod Touch prior to my research and required no explanation on how to use the device. She also picked the iPod up off the table immediately as she began to use it. Lalandras use of the iPod, holding it above the table, is in contrast with the other three participants who kept the iPod on the table for a majority of their time using it. In holding it above the table Lalandra demonstrates familiarity with the device and displays her understanding that the iPod is a mobile device that can be held in her hands and that it can be moved from the table to provide easier use. After using the iPod for awhile and after using the Dora racing game, the students began to hold the device in their hands more frequently. This leads me to believe that children were able to quickly gain a level of comfort using the iPod and were able to apply practices encouraged by some software programs to make
other software programs easier to handle. Cherri and Anastasia both demonstrated that they could independently change the iPod from horizontal to vertical facing to better use the activities. The observation of students in this research shows that the students have little difficulty using the iPod Touch in terms of handling and using the touch screen for input.

The amount of assistance required from the observer provides additional information on the usability of the iPod Touch. The amount of assistance required was first affected by students prior use of an iPod Touch. Lalandra, who had prior experience with the iPod Touch, not only didn't require assistance during her use of the iPod Touch but explained to the observer that her small fingers are better for selecting items on the screen. The observer had difficulty with selecting an icon on the screen, Lalandra stated that "I have small fingers, you have big fingers," and she proceeded to select the screen icon with ease. (Video Record, October 30, 2010) Lalandra's comments about finger size demonstrate a slight difference from the other participants in that she demonstrates her previous experience with the iPod Touch. The other participants required little assistance in terms of being able to handle and use the device. Harvey required the most assistance. At times he needed the observer to read instructions to him and demonstrations on how to achieve game objectives, even though he could play the game. Harvey’s ability to operate a game without understanding the objectives was seen in Angry Birds where he was able to launch birds using the slingshot but needed instruction on aiming.

Anastasia needed help using the MarbleMash tilt game as it provided no instructions, but after a demonstration, required no more assistance. Cherri required instruction on returning to the selection screen. There were two major exceptions to the observation that students needed little assistance during the use of the iPods. The first exception involved technical issues presented by the iPod Touch. During the session with Cherri and Anastasia, the low power icon appeared on
the screen. The second involved the sound not being loud enough on the speakers provided, which required the observer to read aloud certain portions of the literacy activities that could not be heard. The low amount of assistance required by the participants and the ease with which they can learn to handle the device showed that the iPod Touch has potential as a tool for education in that the students can independently use the device. Though Haldane (2007), referring to the Interactive White Board, notes that that the device in itself is not interactive, it's only a tool and that technology is merely a tool applies equally to the iPod Touch.

Educational Potential

Lastly, my research demonstrates the educational potential of the iPod Touch. To begin with, the interviews all show that the children have digital technology already in their homes in the forms of computers (all children), television (all children), console games (Lalandra, Cherri, and Anastasia), and iPods (Harvey and Lalandra). According to Kucer (2009) and the Sociocultural theory it is necessary to incorporate the technologies that are used at home by students in order to build on the skills already developing in the home. The iPod specifically is promoted by the research as well as casual conversation with the parents. The interview shows that Lalandra already uses an iPod Touch and her mother states that, "[Lalandra] prefers the [iPod Touch] for her games." (Initial Interview, October 30, 2010). Portions of my field research notes, pertaining to conversation with Harvey's mother, supports the use of an iPod Touch in that her sons use of the iPod during the research showed her that Harvey enjoyed using an iPod Touch and that she is now looking to buy one for him to use. Lalandras' mother also asked for suggestions on other learning games that I was aware of for the iPod Touch.
The second demonstration of the iPod's potential for educational is that the children used reading and literacy programs independently during the observation. The games that the participants used independently, which were literacy based activities, were Super Why (Cherri and Anastasia), and reading based Goldilocks and the Three Bears (Lalandra). The Goldilocks program reads the story Goldilocks aloud to the Lalandra, although an option to read alone is present. The children can explore the pages and adjust the pace of the reading by choosing when to move on to the next page, allowing them to read the words to themselves or look closer at different areas if the picture. During the use of Super Why, Cherri and Anastasia maintained active attention to the programs throughout the duration of their use. During the Goldilocks read aloud program, Lalandra demonstrated focused attention to the story as it was being read. While the students self-selected use of literacy programs shows that students are willing to choose education on the iPod Touch, their independent use of the device also speaks to the educational potential. It was also mentioned in interviews that students already use technology at home and at school. Cherri informed me during the interview that she "plays games" at the computer lab at school. (Initial Interview, November 1, 2010) Anastasia discusses that her favorite computer game to play at school is "called playground." (Initial Interview, November 1, 2010) Lalandra and her mother in the initial interview discuss that Lalandra "got a MobiGo for her birthday" and that "it is a touch screen game that teaches how to count and what the letters are." (Initial Interview, October 30, 2010) It is important to note Cherri, Lalandra and Anastasia have both used technology at school as well as at home for educational purposes. Levin and Wadmany (2006) discuss that the effect of teachers’ beliefs and practices of technology integration on student learning underlines the importance of the activity, the context, and the culture in which it occurs (Levin & Wadmany, 2006). Thus the use of computer technology in-school and at home
has previously influenced these participants concepts and attitudes towards using technology for learning activities.

In addition to the children's self-selection of literacy activities, they were directed to use the three Meghans' programs, WordFlash, Memory, and Spelling Quiz. All three programs use leveled words as students flip over boxes displaying the words in the memory game or fill in the missing letter in the spelling quiz. These programs were used in conjunction with a paper pretest. The pretest was a replicated paper version of the Meghans' Spelling Quiz. Across the board all students got 0/10 of the questions correct. The low scores on the post-test was largely due to the age of the participants, Lalandra and Harvey are in preschool have not begun to read, and neither has Cherri in Kindergarten. Additionally, for all students, the test was done with no preparation or prior instruction using the words on the quiz. After the quiz, the participants began their use of the iPod Touch.

In the second session, the children used the Memory and WordFlash games which shared word lists with the spelling quiz and the paper pretest before taking the spelling quiz on the iPod. Harvey, Lalandra, demonstrated random selection of tiles to flip over in the memory game. Cherri, however, was able to explain to me that she was thinking about how she found matching words, "I saw that one, I did that one last time, then I flipped this one over then I flipped this one over and I made a match."(Video Observation, October 30, 2010) This research shows that while the children were able to operate the memory game, they did not all process it in the same manner. The second literacy activity was the WordFlash, which involved the game saying the word on the screen aloud and having the student repeat it. This activity was completed by all of the students. Each student did the first couple words with myself. When they began to use the flashcard program independently, Cherri and Lalandra stopped repeating the words aloud for
three words before resuming repeating the words aloud. Cherri also showed that she was less engaged with the WordFlash than any other student during all other portions of the observation. After completing the two supplemental activities, the students then completed Meghans Spelling Quiz on the iPod Touch. The findings of this research found no improvement in the scores of the children. Cherri and Lalandra both got zero correct answers on the post test and Harvey refused to take it. Harvey’s refusal was likely connected to his writing confidence. After writing his name on the pre-test, Harvey began to cry because he felt his writing was bad. Anastasia, the oldest participant, increased the amount of correct answers from zero correct on the paper pre-test, to getting four correct answers on the Meghans Spelling Quiz on the iPod Touch. This finding of my research shows that the manner these literacy programs were used did little to support literacy learning. According to Vess (2006) it is important that literacy learning through technology can be successful if it's based on solid learning theory. Solid learning theory however, was not the case in the students use of the literacy programs in this research. First, reading and spelling is above the appropriate level for independent learning and instruction for children at this age. Second the words used in the spelling quiz were taught in isolation in a non-authentic manner. The research then demonstrates that in order for the iPod Touch to be used in an effective manner it is up to the educator to teach based on solid learning theory, as well as select programs that promote student engagement.

Lastly, the low amount of direct instruction that the students needed to operate the device and the programs supports the iPod Touch as a device that could be readily used in a classroom without extensive training. As discussed in the usability and engagement sections, and shown in my research, the iPod Touch is a technological device that children are capable of using and that the children enjoy using. In order for students to be considered self-sufficient users of the iPod
Touch they needed to be able to operate the device with minimal assistance from myself or an instructor. However the research also demonstrates that not all programs are as engaging or easy for the children to use. The children in the research demonstrated through differing levels of engagement and literacy learning that the iPod Touch has the potential to be an effective education tool but is not guaranteed to be effective.

**Implications**

The findings of my research have several implications for me as a teacher. As Larson and Marsh (2005) state, it is important to develop a level of comfort and competence with new technologies. For education practitioners, the use of the iPod Touch in the classroom will help students to develop New Literacy skills. The findings of my research suggest that an iPod Touch can be used to bolster student engagement with technology by being easy to use and by providing engaging activities to students.

The first implication is that the iPod Touch device is practical and appropriate for use in the classroom. This result from the findings that the early elementary children involved in this study were able to functionally operate the input requirements of the iPod Touch. The observations showed that the participants were effectively able to operate the touch screen and tilt motion input which was required. This finding is important since the iPod Touch is a small single user device and it is essential for students to be able to operate the device in order to engage with the software independently. In a classroom setting, the self-sufficient use of the iPod Touch has the potential to be a valuable tool for harnessing the student engagement for either recreational or educational tasks.
The second implication is that in order to support student engagement with an iPod Touch, teachers must make knowledgeable software selections. Educators who carefully select the software they use acknowledge that a touch-screen interactive whiteboard isn't engaging, that it is just a tool, and the engagement is dependent upon the teacher to take full advantage of its capabilities. (Haldane, 2007) My research provided two suggestions that educators should consider when selecting software to engage students using the iPod Touch. The first suggestion is that software which provides clear verbal and visual instructions, such as the Dora software, will support student engagement by enabling them to play independently with the iPod Touch. The second suggestion is that programs which provide a variety of multimodal activity promote greater student engagement when using the iPod Touch. In my research, students were observed spending the most time with activities that consisted of variety of interactive forms, such as touching, tilting, seeing, and listening. Participant preference for interactive software concurs with the findings of Jewitt, Moss and Cardini (2007) who similarly found that students who used technology in an more interactive fashion were more engaged. Therefore, software which promotes independent use and that requires multimodal interaction should be selected to engage students with the iPod Touch and other forms of touch-screen technology.

The third implication that results from my research relates to the specific use of literacy activities selected for my participants to use on the iPod Touch. My study found that the use of Meghan's Word activities did not result in increased student performance between the pre and post test and that teachers should not use the iPod Touch as the sole method of instruction. The lack of increased performance implies that the iPod Touch is not effective for sole instruction. As the literature suggests, student development through using new technology can be achieved when instruction is based on solid learning theory (Vess, 2006; Stockwell, 2007). Student development
is not demonstrated by the use of the iPod Touch as stand-alone tool for literacy learning in my research.

What I have learned through this research is that I will be able to use an iPod Touch as a technology tool in the classroom, but I am left wondering how the iPod Touch can be utilized as an effective literacy learning tool. The iPod Touch is a device that students have the ability to use and it will help them as they develop the skills necessary for utilizing other digital tools and devices which use touch-screen technology. The skill to use touch-screen devices enables our students to operate these devices and will help prepare them to interact in a society which increasingly uses digital technology across home, school, social, and workplace environments.

The implications of my research and findings have left me wondering how the iPod Touch can be used as effective tool for literacy learning. I suggest that future research should capitalize on the student engagement that is connected to technology use by Kervin (2005), Rumpler (2007), Lee (2009), Swan et al. (2007) and in my study, and evaluate the iPod Touch as an extension of classroom learning rather than the sole method of literacy instruction. This would branch a significant manner in which my research was limited. The participants involved in my research were asked to interact with literacy activities independent of teacher led instruction. Another limitation of my study is the small number of participants involved, as a result it is clear that this study cannot be used to create generalizations pertaining to the use the iPod Touch. Lastly my study was limited by the age range. By involving older children who are more independent, the iPod could potentially provide a greater impact on literacy development without the teacher led instruction.

After conducting the review of literature and my research I am left with several questions about using the iPod Touch for literacy learning. Due to the lack of improvement from pre-test to
post-test I question the authenticity of the Meghans programs as literacy activities. Although when asking this question I must acknowledge that the Meghans programs were used in a stand-alone manner and must ask myself how these programs could have been used to support instruction. A question related to the directed literacy activities that also must be considered is the age of the children. Would literacy activities on the iPod Touch be more beneficial for older children who can already read in an independent manner? The last question I ask is based upon the goal of minimal interactions involved in my research with the participants trying to ascertain the usability of the iPod. Would working together with the iPod Touch and myself have supported children's literacy development in a more significant manner?

**Conclusion**

Early elementary students were found capable of using the touch-screen input and tilt input required to use an iPod Touch. The children's ability to interact with the iPod Touch in a functional manner can be used to support student development of new literacy skills. The software on the iPod Touch and the multimodal interactions of sound, visual, and kinesthetic generate student engagement and focus when using the device. However in order to be utilized for student literacy development the iPod Touch cannot be a stand-alone tool. The iPod Touch is just a tool and its practical benefits in the classroom are dependent upon the teacher; the teachers selection of software, and the teachers ability to integrate the use of technology based on solid learning theory.
References


Appendix (A)

Initial Interview:

- What kinds of technology do you use in your house and how often do you use it?
  
  *Prompt: Technology is things like television, computers, and video games.*

- Can you tell me what you like to do with technology? *Prompt: You told me you have a _____ can you tell me a story about when you used it?*

- How do you use technology with other people in the house? People outside the house?

- What do you think about using technology for learning?

- What technology do you have in school and how do you use it?

- Have you ever used an iPod before, what can you use it for?

- Have you heard of or used an iPod Touch or another computer where you touch the screen to make it work?

Post Interview:

- What did you do with the iPod Touch?

- What did you dislike about using the iPod touch? Can you tell me something you enjoyed?

- Were you able to use the iPod touch easily?

- How did you feel about using the iPod Touch for learning?

Appendix (B)

Pretests:

Preschool Pretest:  Participant:  Date:  Tester:  

Instructions:  Select the letter that makes a word

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### Kindergarten Pretest

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**Date:**

**Tester:**

**Instructions:** Select the letter that makes a word

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**1st grade Pretest:**  Participant:  Date:  Tester:

**Instructions:** Select the letter that makes a word

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