IS THERE AN APP FOR THAT?

THE USAGE OF MOBILE TECHNOLOGY FOR THE PURPOSES OF TEACHING HEALTH EDUCATION IN GRADE 4 AND 5.

by

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A thesis submitted in conformity with the requirements for the degree of Masters of Arts
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ABSTRACT
The use of mobile devices in elementary schools has steadily increased in the last few years. These mobile devices harness many tools that can help teachers teach classroom material and help students become better students academically. The research question was “How can mobile devices be used to teach health education?” Research was conducted in a grade 4 and 5 classroom to see which mobile apps worked best among teachers and students in conveying health education. Anecdotal notes and daily journaling over a two-month period documented how the students enjoyed playing games and also how engaged they were when they subsequently used the devices for non-gaming purposes. It is still unknown how well these apps conveyed messages of health. How the mobile apps are being used in the classroom and the content inside the mobile apps largely dictates the messages they can convey to the students.

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Without the strength and direction that God has given me, I would not have been able write this thesis.

This thesis is dedicated to my wife Saira who encouraged me to apply to OISE at U of T and who supported and stood by me the entire time while I completed my Masters degree. It has been a long road and this is but a drop in the ocean of appreciation I can show you for your tireless work and efforts to keep me focused and moving forward academically.

Thank you Saira
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Chapter 1 - Introduction

This study investigates how health education (HE) may be taught through technology in an elementary school setting. The overarching question of this study is ‘How can mobile technology be used to teach health education (HE)?’ The purpose of this study is to look at whether mobile technology may be used as an aid in HE and if so, to identify which applications (apps) are best suited to this purpose. The purpose is two-fold: to explore the nature and impact of digital mobile technology in health education while looking for evidence on the results of these efforts. Some the impacts will be seen through some of the more prevalent, popular and positively rated apps on the Apple iOS platform, since Apple has been a dominant force in penetrating the educational market over any other platform, even though as a whole, more Canadians use the Android operating system (Ipsos, 2012).

Subsequently, I will analyze and critique these apps for their usage in promoting health education and potential to create change in youth and adolescent health in my own classroom, based on anecdotal evidence and journaling of my own and student progress over time.

1.1 - The Existing Landscape of Health and Physical Education in Ontario Schools

In the Ontario elementary school curriculum, health education is combined with physical education. The Ontario Ministry of Education separates the two subjects distinctly by assigning them each their own set of curriculum expectations and having them reported on the Ontario Report Card separately, a mark for Physical Education (PE) and a mark for Health Education (HE). HE and PE are together allotted 90 minutes of classroom instructional time on a weekly basis. Each school’s administrators, prior to the start of each school year, individually decide how this time is dispersed throughout the week. Although part of a collective group of administrators in the YRDSB, each administrator may have their own agenda when it comes to the flexibility of time allotted per subject or the importance given to each subject, in particular
HE. If this is the case, then some schools or classrooms may receive more or less time designated to the teaching of HE.

Moreover, the fact that HE is taught in conjunction with PE and has a combined allotted time with PE further complicates the instructional integrity of HE. For example, through my various experiences I have seen some teachers may spend an entire term teaching HE expectations where others may only spend a week to teach expectations they feel are necessary. There can be a wide degree of variability when it comes to the amount of time HE is allocated.

1.2 Personal Background

This study emerged from my personal experiences. I grew up watching my father put time, effort and care into his electronic sound systems. His enjoyment transferred me and I somehow adopted his appreciation for technology and gadgets. In time, I became old enough to purchase my own devices. It started out with a simple Sony Walkman and eventually reached an Apple iPhone. I was immersed in the world of gadgets and technology from a very young age and I continue to be fascinated by their capabilities and their possibilities.

My interest in health only blossomed during my undergraduate studies in field of Kinesiology. Growing up in an immigrant family, nutrition and health were of low priority given the more short-term goals of daily livelihood. Consequently, I knew little of what constituted good health practices given that my only concern was playing some sort of sport outside. As the years went on, it was through the knowledge gained through my Kinesiology degree that I submerged into rich topics surrounding cancer, physical activity, and nutrition, among others. I soon developed a thirst for knowledge regarding certain processes in the body, how it operated the way that they did and the factors that were associated with causing change in the body. This desire, stemming from my love of sports and athletics from a very young age, complemented my desire to
complete a bachelors degree in Kinesiology. Technology and health now coexist seamlessly within my own classroom.

As a teacher, I am now in the position to share my learning and impart knowledge pertaining to health and physical activity to students. The adaptation of using technology in the classroom had become even easier given that many students bring in their own technology to use in my class. My goal has always been to integrate HE and technology, more specifically mobile technology. Yet its this blending of technology and HE that serves as a road less travelled many teachers I have informally spoken to through my practice. As a result, my journey to empower youth with health education through engaging technology-related instruction underpins my reason for selecting this topic.

Over the last number of years, since the explosion of mobile technology (i.e. smartphones, iPod Touches, tablets), the York Region District School Board (YRDSB) has had to address the issue of using mobile technology in the classroom and take a stance on students bringing their own devices to school for use. The YRDSB along with other school boards (i.e. Toronto District School Board, and Peel District School Board) have since refined a firm policy on the appropriate usage of technology in school (Peel District School Board, 2011; Toronto District School Board, n.d.). These policies held by each individual school board affirm that personal technological devices may be brought into the classroom and used for educational purposes.

Mobile devices have an explosive potential to new unlock opportunities. In fact, there is so much potential that it is easy to become overwhelmed and lost in the inordinate number of ways in which mobile devices may be used for inside the classroom. We need to use mobile devices to maintain the health of youth, if not work to consciously improve it (Arteaga, Kudeki, & Woodworth, 2009; Woolford, Clark, Strecher & Resnicow, 2010).
1.3 Format of the Thesis

This thesis will be divided into a series of chapters. The next chapter will outline the existing literature on mobile technology in the classroom and the implications it can have on health and health education. Chapter 3 discusses the methodological approach my research will focus on and why that approach is being taken. This is followed by a results chapter and discussion on the research conducted.
Chapter 2 - Literature Review

The iconic chalk and blackboard classroom has evolved considerably since the early days of formal education. With the proliferation of technology, more and more schools are implementing technology into their classrooms to improve student success (Ontario Ministry of Education, 2009). Nevertheless, questions pertaining to the use of technology and its effect on students remain unanswered. The rationale underpinning this paper is to map out the existing research base within the landscape of mobile technology in the classroom. This literature review will examine important factors surrounding mobile technology usage in school classrooms. It will specifically discuss how technology aids students in their classroom learning, how technology might foster positive social behaviours, the role of the teacher in implementing technological tools, and the effects of learning online.

2.1 - Teacher Training

The integration and the use of technology in the classroom is not as seamless as some of us may believe. The ubiquity of technology these days still requires training on how to effectively use a given piece of technology (Niess, 2005). Kleiman (2000) shares the same sentiments suggesting that successful technology use does not require a computer for each student, but rather demands the preparation and support of teachers implementing the technology. It must be clear that teachers with a basic understanding of computers and their use can potentially implement technology effectively at school (Kleiman, 2000).

Teachers are able to adjust to new technology and are capable of making decisions based on their interests. Franklin, Sexton, Lu and Ma (2007) found that, when teachers were given a Personal Digital Assistant (PDA) over a period of time, they adjusted to the technology. They did so by not just learning how to use the technological tool, but by using it to their advantage,
such as for assessment purposes, creating calendar events for assignments or emailing other teachers about ideas. The teachers also began to download applications for their PDAs, which personally suited their needs and their instructional practices (Franklin et al., 2007). Yet with a 12% failure rate of PDA’s not functioning properly and having accompanying problems, Franklin et al. (2007) make it clear that mobile technology is not without its shortcomings.

In 2003, Seppala and Alamaki examined how teachers employ mobile technology. Figure 1 is an illustration from their study. They investigated how teachers shared their ideas through short messages service (SMS), also known as text messages. The study showed that teachers used SMS quite regularly accompanied with digital pictures to share their work and ideas. Kynäslahti (2003), as cited by Seppala and Alamaki’s (2007) study, mentioned three components that mobility is based on and which teachers subsequently rely on: Convenience, expediency and immediacy. The ability to take pictures, send messages and make notes while using mobile devices allowed the teachers in the study to experience all three components of mobility.

Furthermore Cebeci and Tekdal (2006) linked the benefits of audio recordings or podcasts to an important pedagogic characteristic, which is learning through listening. Not only are audio recordings or podcasts convenient and accessible at any time, but they allow the student to access the information in a different way. Cebeci and Tekdal (2006) emphasize how podcasts and the act of listening may benefit students who may be poor at reading while simultaneously capitalizing on their excitement regarding technology.
Subsequently, there can be more at stake for a teacher when it comes time to implementing, integrating and planning for a classroom with mobile technology. Reid, Kervin, Vardy and Hindle (2006) found that implementing technology in the classroom (i.e. Apple iPods) can prove to be a challenge due to extenuating factors such as the instructional plan, the level of the students, and the reaction students might have towards the technology. Brookshire (2007) discussed how the incorporation of audio and video into a mobile device has increased the possibilities of instructional uses. Moreover, he point out how delivering and creating content for teachers and students has become almost effortless.

Teachers are often in a position of learning how to use technology when it is given to them to use in their classrooms (Kervin, Reid, Vardy & Hindle, 2006). In one study, Kervin et al. (2006) identified how some technical aspects, such as preparing files for audio listening, took
time to get used to. Despite this, teachers reported they learned more about how their students learn when using iPods as a teaching tool.

More importantly, mobile devices allow teachers and students to have instant access to information at all times. This further enhances the teachers' ability to be an effective instructor by freeing up the teacher to engage in tasks like monitoring the students' learning progress, monitoring participation, implementing various activities and monitoring whether students are deviating from an idea, task or lesson (Liu, Wang, Liang, Chan, Ko & Yang, 2003). Yet, Liu et al. (2003) do mention how the use of technology depends entirely on how the teacher uses it. Ultimately, the teacher must understand the benefits and limitations of mobile technology for instructional purposes in the classroom.

2.2 - Technology & Academic Achievement

It has been noted that technology in the school environment shows signs of fostering academic improvement. Sivin-Kachala (1998) extensively reviewed studies that documented technology and its effect on academic achievement spanning from 1990 to 1997. Sivin-Kachala found that students who were learning in technology intensive environments tended to improve academically. This trend was visible from pre-school all the way through to higher education. Moreover, student attitudes improved when technology was used during instruction. The latter of these findings begins to broach the social aspect of the use of technology, which will be discussed later in this review.

In the area of math in particular, Wenglinsky (1998) conducted a national study focusing on mathematical achievement and found that students in grades 5 and 8, when using higher order thinking software rather than “drill and kill”, showed gains in math scores. The increase in math scores was also correlated with those students who had teachers that received professional training on the use of technology. Lastly, in the same study, although fifth graders only
performed three to five weeks ahead of their counterparts that were not technology using students, there remained a marginal increase in their learning. Another study demonstrated that students who participated in a Computer Supported Intentional Learning Environment, had higher scores on standardized reading and language tests, wrote with multiple perspectives, and displayed independent thinking (Scardamalia & Bereiter, 1996). These findings suggest that technology may be instrumental in student achievement, yet effective use of technology in schools is still a topic that garners many perspectives as there are studies that show that even television, in some circumstances can be a positive technological tool (Seels et al., 1996; Neuman, 1995; Reeves, 1998).

2.3 - Technology & Social Development

Kmita & Davis (2004) claim that computer technologies in schools have a positive impact on the social environment of students who use them. They continue by saying that students are overall happier doing work when using computers. In contrast, Nie and Erbring (2000) found a correlation between students spending time on the Internet and social isolation. Socially aware teachers, according to Zhao et al. are those that are technologically savvy and socially sophisticated when it comes to understand technology and its social dynamics. All of these attributes contribute to creating a positive social environment where technological innovation can take place. These examples show how technology can shape social behavior and also how technology can be influenced by social constructs.

2.4 - Implementing Technology in the Classroom

Teachers play multiple roles inside the classroom including determining mediums through which lessons take place. With a large array of technologies that can be used, there are a wide variety of ways to implement them. Before the stage of implementation begins, Hu et al. (2003) note that the perceived ease of use has a minor effect on teachers’. This means that
teachers may not likely adopt technology simply because it looks easy to use. Zhao et al.’s (2002) earlier argument about teachers needing to be technically savvy has bearing on Hu et al.’s claim that computer self-efficacy helps in determining whether teachers will adopt technology. The more computer self-efficacy has the greater the perceived ease of use is.

The social construction of technology as discussed by Jones and Orlikowski (2009) informs us that rather than technology shaping the way humans operate, technology is socially driven and shaped by the human, depending on the need. The authenticity of a task can be seen through constructivist theory, which suggests students construct their knowledge independently. The more teachers use technology for a prolonged period of time, the more their pedagogy begins to move towards the constructivist approach (Windschitl & Sahl, 2002).

Kim, Miranda and Olaciregui (2008) mention how mobile technology is helping poor populations and developing countries, which are opting to build mobile networks over landlines. Sharples, Taylor and Vavoula (2005) suggest that this transition, coupled with the advancement in mobile technology, will help reach populations in both rural and urban areas. What seems to make this transition all the more advantageous is the cheap technology that allows mobile learning to take place. Simple portable media devices may start as low as $16, which have a digital camera and enough storage to encompass textbooks and educational videos (Kim et al. 2008). Kim et al.’s (2008) study found that mobile technology amongst adolescents, when used in villages, became the most popular sources of excitement, more so than any other activity in the village. In places where there was a lack of infrastructure for education or technology, simple mobile devices and mobile learning may be the best and sometimes the only means of education.

Similarly, Roschelle (2003) tells us how mobile technology, or wireless Internet learning devices (WILD) as described in this study, can serve the enhance social activity inside the
classroom. This study illustrates how children are more participatory when using WILD technology. If an answer is composed and posted online, other students can see this composition and reply to it, edit it, provide feedback, allowing them to become more engaged in their learning (Roschelle, 2003). This allows students the opportunity to collaborate with one another in a given social space online, allowing more reserved students a place where their presence can have a larger impact.

Mobile technology has become nearly ubiquitous with its alarmingly fast advances. Lai, Yang, Chen, Ho and Chen (2007) describe how it has modernized the way so many things are done in a learning setting. Some of these things include tools such as recording, taking photos, video and facilitating note taking. This is become such an advantage that it accelerates learning and facilitates different learning styles (Lai et al., 2007). Lai et al. continue by mentioning that mobile technology provides affordances such as ‘real time’ information at our fingertips. Through the Google search engine. Another affordance is the diverse array of tools mobile technology is capable of providing. Ultimately, Lai et al.’s (2007) research concludes by mentioning that through experiential learning, students with a PDA outperformed those without a PDA on certain assessments.

If we look at students or teachers working with technology, it is important to note how each one is interacting with their given technology. When we think about desktop computers, Vahey, Tatar and Roschelle (2006) observe that interaction tends to be private. They describe how we are often not in communication with others around us resulting in the interaction being a private endeavor. Handheld devices are more conducive to face-to-face interactions. Their results showed that teachers quickly adapted to the use of handheld devices in their classrooms and also felt that their students worked even better on tasks with a handheld device or computer as opposed to a paper and pencil (Vahey, Tatar & Roschelle, 2006). In the end, although Vahey
et al., (2006) could not assert claims of the handheld devices directly related to an increase in academic scores, they did say that their study showed compelling evidence that handheld devices may lead to learning gains.

Mobile technology supports different forms of media, which may be easily accessed by the students, such as podcasts. Podcasts serve as a great resource that will not replace classroom instruction, but can act as a supplement for students who use it to clarify their understanding of topics (Frydenberg, 2006). This was explored by Craig and Paraiso (2007) in a study comparing and contrasting having Apple iPods in urban and rural elementary English Language Learner (ELL) classrooms. Many of the results and data provided by the teachers in the study found that depth of discussion, vocabulary, and quality of writing all improved. But whether this was directly correlated to the iPods was difficult to know (Craig & Paraiso, 2007). One point, which was brought to light in this study was how the iPods acted as a great way of differentiating the learning for the ELL students, integrating into their lessons. Complementary to this, Kervin et al. (2006) tells us that students were able to use iPods in class to access on-demand content to aid in their learning.

iPods have advantages and disadvantages when compared to other mobile technology. iPods have a high potential in helping a student with differentiated learning needs. With their mobility and instant accessibility, iPods have helped students in school and at home (Mueller, Wood, De Pasquale and Archer, 2011). Other mobile devices such as Blackberry’s, serve other learning needs. Generally, Blackberry has been used in students communicating with each other at higher levels of academia. Mueller et al.’s study did uncover one more important aspect of mobile technology in the classroom since grades K-12 were being observed. As they got older, students began to report drawbacks to mobile technology. Concerns were raised about its potentially addictive qualities and the impact on student achievement it can possibly have
(Mueller et al., 2011). Its distracting qualities can lend students to spending and even wasting more time than is necessary on mobile devices.

Across ELL students, we see a positive trend in the use of mobile phones to assist in learning (Thornton & Houser, 2005). In their research, Thornton and House found that university students used emails to set up study sessions and exchange class notes. They generally found the mobile devices helpful when it was used for university purposes. Thornton and Houser (2005) found university students were comfortable viewing texts and watching videos on small screens, which can normally be a hindrance to many students (Shudong & Higgins, 2005).

Mobile technology does not just enhance learning, but it can also help to change the general learning style of students. Wang, Shen, Novak and Pan (2008) explain that Chinese students are used to learning by listening and memorizing from audio or a CD-Rom, resulting in the student being a passive participant in the learning. The Chinese students were then provided with mobile phones in which they had access to class content through interactive videos, and more. It was discovered that students become more active participants by receiving content through their mobile phones, thereby promoting social and intellectual interactions (Wang et al., 2009).

2.5 - Online/Distance Learning

In the traditional sense, the teacher has always been present in the classroom. However, as technology has continued to advance, online learning and distance learning have become another avenue where technology has played an important role (O’Malley & McCraw, 1999). A study conducted by O’Malley and McCraw (1999) asked undergraduate students to describe their perceptions of online learning and distance learning. Surprisingly, many preferred traditional lecture style education, yet they also enjoyed the advantages that online learning
provided such as saving time, convenience and the ability to take more than one course. In another study, students echoed some of the same sentiments about how they enjoyed the convenience that online learning provided (Sit et al., 2005). They felt that online learning allowed them to be more responsible for their learning. On the other hand, a major drawback the students shared was the lack of human interaction when it was most needed. Social presence theory helps explain why students may perceive online learning the way they do. This theory articulates the important role people play when communicating with one another. Social presence examines the degree to which a person is real in communication (Richardson & Swan, 2003) and how increases in social presence are thought to correlate with satisfaction and learning.

2.6 - Technology in Health Education

The health behaviours of students have been an important focus in schools over a number of years (Donovan, Jessor & Costa, 1991; Kelder, Perry, & Klepp, 1993). Only recently has technology been used to aid in health education (Andersen & Andersen, 2011; Papastergiou, 2009). Video games provide one path through which health education may be taught (Baranowski, Buday, & Baranowski, 2008). In their research, Baranowski et al., suggest that there are health related changes that may occur through role-playing video games. In particular, video games aimed at changing physical activity and diet behaviours had a positive effect on health behaviours (Baranowski et al. 2008). This study also mentioned that three out of four video games aimed at changing health behaviours were focused on asthma and documented fewer hospitalizations (Baranowski et al., 2008), (Bartholomew LK, Shegog R, Parcel GS, Gold RS, Fernandez M, Czyzewski DI, Sockrider MM, Berlin N, 2000). One of the games even went as far as demonstrating significant reduction in emergency medical care. Games which had a narrow focus, such as teaching children to monitor food intake in order to control glucose levels

SMACK, a video game that allows teens to play roles where they are perpetually encountering drug abuse related scenarios, provides a forum for teens to evaluate their decision-making and to see the realistic repercussions of using drugs (Oakley, 1994). Video games are not the only area of technology where health improvements have been considered. Within the classroom setting, computers have been used to replace classroom instruction with interactive software that helps lower fat consumption and increase levels of physical activity (Marcus, Owen, Forsyth, Cavill & Fridinger, 1998). According to Marcus et al. (1998), their study displayed nearly no effect in the long run on improved physical activity behavior amongst students with mass-media promotional programs. Yet amidst the many mass-media promotions and technological tools to disseminate knowledge to help improve physical health, Marcus et al., shares the importance of the message rather then the medium “The new information technology … should not detract from the professional and scientific imperative to deliver materials, resources and programs which are based on sound knowledge and substance.” (p. 375). On the other hand, other computer and video games may prove to be more of a detriment to students’ health than a benefit (Dorman, 1997). The study suggests that there are some cases of students having epileptic seizures with some videos games.

But the study still asserts that video games may be used in positive ways to promote health education (Dorman, 1997). A worry that did not arise through the literature, yet is a common concern among parents, is the unorthodox way video games may help students learn in comparison with traditional teaching strategies (1997).

Consolvo, Everitt, Smith and Landay (2006) describe the results of their study involving a mobile application intended to improve physical activity. They found that some of the positive
changes in participants arose from social pressure; Students were more motivated to achieve their goals since they were sharing their results with one another. Along with including a component of social influence for participants, proper credit should also be given to motivate participants to be physically active (Consolvo et al., 2006).

Another empirical study by Lin, Mamykina, Lindtner, Delajoux and Strub (2006) tells a similar story in which a computer application called Fish’n’Steps makes use of a pedometer and visually monitoring the progress of other fish (friends) in your tank. Lin et al., reported that although the novelty of the application wore off after a short period, they still found positive changes in daily routines of physical activity had been made.

Technology has not always been correlated with positive healthy behaviours in students. Ogunleye, Voss and Sandercock (2011) found that time spent in front of a screen in excess of 2 hours was directly correlated to a decline in physical activity. Moreover, if screen time was less than 2 hours, students were more likely to increase their participation in physical activity (Ogunleye et al. 2011).

Looking at the effect in adults, Hurling, Catt, Boni, Fairley, Hurst, Murray, Richardson and Sodhi (2007) found that there was a significant positive change in physical activity when automated Internet and mobile phone-based systems are used. This study is unique in that the results of accelerometers, which can differentiate movements and speeds, were used to determine the extent of the participant’s physical activity level (Hurling et al., 2006).

2.7 - Problems in Using Technology in Health Education

Parry, Holt and Gillies (2001) mention that the constant change in software poses problems when using technology to teach health. Parry et al., (2001) observes that with the increased speeds in internet quality, the ease of use and reliability increase commensurately. A source for disseminating knowledge that benefits from increased Internet speeds is podcasting
and video podcasting (Walton, Childs & Blenkinsopp, 2005). Walton et al. (2006) suggests that podcasting and video podcasting are on the rise amongst mobile phone users and may be utilized as a good tool for health education. High quality video messaging has also been found to effectively promote smoking cessation among teens (Whittaker, Maddison, McRobbie, Bullen, Denny, Dorey, Ellis-Pegler, Rooyen & Rodgers, 2008). Although the study only had 15 participants in it, 60% of the participants stopped smoking while participating in the study (Whittaker et al, 2008). What stood out in this study was not just the successful use of technology in educating teens but how roles models, through the video messaging, served to influence behaviors in a positive manner (Whittaker, 2008).

Since technology is often changing and advancing, Geiger, Petri, Myers, Lan, Binkley, Aldige and Berdebes (2002) found that teachers are reluctant to implement health education using unfamiliar software. The study also mentioned that technology is not always readily available in all schools. It is shared, or competed for, which leads to difficulty in using it to implement health education (Geiger et al., 2002). Contrary to the hurdles, the study found that using software to teach students health education yielded 93% of students to say that their interest in health education had increased, even a year after the study was conducted (Geiger et al. 2002).

The theory of conversational learning introduced by Gordon Pask (Taylor, 2010) is used to highlight the hindering qualities that mobile technology may have on student learning. Conversational learning describes the conversations that a student may have with others, with themselves, with their environment, with their device and with their teacher (Sharples, 2002). These conversations, as Sharples tells us, are all part of the learning that takes place. The issue arises when the communication technology component is brought into the picture. Sharples argues that although this can help a student in their learning, it also provides a distraction and
disruption to the regular flow of how learning and teaching traditionally occur. The author goes on to suggest that the design of technology should support conversational learning, continuing to allow engagement, exploration and learning to occur the way they were meant to be (Sharples, 2002).

Electronic bullying, also known as cyber bullying, has gained prominence in the literature over the years (Kowalski & Limber, 2007). With the use of mobile technology constantly increasing amongst youth (Nollen, Hutcheson, Carlson, Rapoff, Goggin, Mayfield & Ellerbeck, 2013; Skierkowski & Wood, 2012), communication through these devices has become increasingly popular. This has led to cyber bullying. Some of the findings show that in one study, 50% of the teenage population use cell phones, 97% use the Internet and a quarter of the female population reported they have been bullied electronically in the last few months (Kowalski & Limber, 2007). Kowalski and Limber suggest that it is possible that participants may not have reported on bullying instances because they were unaware of them, thereby underestimating the true instances of bullying.

Concerns over the health of individuals using the Internet prompted a major review of 38 distinct studies. This review showed that time spent on online in peer-to-peer community interactions (where individuals can go to socialize, seek help and provide help to others on a single platform) has a positive effect on the health of an individual. (Kraut, Olson, Banaji, Bruckman, Cohen, & Couper, 2004). While no real negative effects were reported in the study, Kraut et al., (2004) suggest that online social interactions are less authentic than offline ones since there is a host of inefficiencies, for instance spam and verbal inhibition, that degrade the quality of an online peer-to-peer community.

Some of the literature describes a contradiction between using mobile technology (i.e. cell phones) to facilitate health education given that it has been claimed that cell phones may
cause harm to ones health (Aydin et al., 2007; Thormee, Harenstam & Hagberg, 2011; Thomee et al., 2011). Although focused on young adults, Thormee, Harenstam and Hagberg (2011) found that a little more than half of their studied population considered themselves as “low” mobile phone users and the rest as “high” mobile phone users. Moreover, a high level of mobile phone usage was correlated with signs of mental health disorders, such as stress and depression (Thomee et al., 2011). For adolescents and children, the results were more positive. A study of 352 participants, ages 7-19 were assessed for brain tumors based on the mobile phone exposure throughout a 4 year period. The children showed no sign of brain tumors based on their mobile phone usage (Aydin et al., 2007). Yet, the researchers do suggest that mobile phone usage may not have been high enough to cause any signs of tumors and may furthermore increase as children get older.

2.8 - New Forms of Technology as Tools in Health Education

The Internet, photography, video and music making software are all possible avenues in which health education and promotion may be delivered (Flicker, Maley, Ridgley, Biscoe, Lombardo & Skinner, 2008). Even more importantly are the newer forms of communication technology such as Facebook, Flickr and YouTube, which are popular methods for reaching youth (Flicker et al. 2008). Writing can be a difficult or even a cumbersome task for some students in school (Yancey, 2009). As teens aged between 14-17 quickly move towards fast forms of writing such as Twitter or text messaging through their mobile devices, these students do not necessarily think of it as writing (Lenhart, Purcell, Smith & Zickuhr, 2010; Yancey, 2009).

With that being said, social media seems the most likeliest to travel as an educational tool, as it can serve as a potential bridge between in school formal education and informal learning experiences outside of school (Bull, Thompson, Searson, Garofalo, Park, Young, & Lee,
Since only 40% of U.S. states use technology for physical education, Burgeson, Wechsler, Brener, Young and Spain (2001) suggest that technology can be used more to facilitate teaching for students with disabilities. Chu, Choudhury, Shortt, Pincus, Creed and Kendall (2004) go as far as to say that technology such as DVDs or self-guided computer software can make the difference in making a health treatment a success or failure.

Neville, Greene, McLeod, Tracy and Surie (2002) seem to agree with the studies discussed above. Neville et al. (2002) found that not only did text message reminders help asthma patients take their inhalers, but they suggest that the lifestyle text message reminders which consisted of sports, news, celebrity gossip blended well into the participants lifestyle. Levine, McCright, Dobkin, Woodruff and Klausner (2008) also corroborate evidence behind the use of text messaging as a means to inform and educate youth in health education. The study (Levine et al., 2008) targeted a particular youth group who owned cell phones, and send text messages that focused on providing sex facts, relationship tips (based on healthy behaviours) and even referrals to clinics. Levine et al. (2008) reported the awareness of the text message program amongst youth was 44%. However, the awareness level was 77% for those youth living in targeted neighborhoods and 90% among those that had cell phones.

Selki, Benson and Moreno (2011) used a similar technique to provide sexual health information to adolescent youth. They related how the adolescent youth preferred the interactive way of communicating to obtain their sexual education information. What made the interaction so valuable for some was the idea that rather than going to a website, which presents information in a textbook like manner, interacting via text messages was a conversation. Someone was, in fact, at the end of the communication line.

Lastly, Selki et al. (2011) found that communication was much easier through texting since they did not have to deal with the subject in person. The study revealed three main themes
as to what the youth in the study look for when obtaining health information, 1) accessibility; 2) trustworthiness, credibility, and confidentiality; and 3) personal comfort. Accessibility may seem rather easy to come by through mobile platforms and access to Google, but the youth in the study felt that even through Google searches it was hard to find specific sexual health information that the respondents found useful. The respondents also wanted to get information from a trustworthy source. A main source cited often in this study was WebMD. The youth added that, if they were to ask questions via text messages, they would want to feel that the person on the other end was knowledgeable about sexual health. This ties directly into the last theme of personal comfort. The youth felt they wanted to feel relaxed and at ease when it came to discussing sexual education since some felt that they might be met with disapproval, depending on whom they spoke to about the subject matter.

Selki et al. (2011) touches upon a number of issues related to youth in using technology for the purposes of HE but overall indicates how mobile technology may be used in furthering and promoting HE.
Chapter 3 - Methodology

3.1 – Research Design

As I dive into possible ways to enhance HE at the grade 4 level with the use of technology, action research appears to be the most effective way to explore new educational practices. Stephen Kemmis, one of the founding theorists of action research, says that action research “aims at changing three things, practitioners practices, their understandings of their practices, and the conditions in which they practice.” (Kemmis, 2007, p. 1). All three are important factors in this study. However, my work focuses on the first two elements identified by Kemmis.

The overarching question of this study is ‘How can mobile technology be used to teach health education (HE)?’ This paper begins an analysis of how health education (HE) may be taught through the use of mobile technology. Further, it determines which applications from a preselected group might yield a positive learning experience and reasons stemming from this. The methodology is grounded in action research. Practical action research, which is a component of action research, focuses on the “how-to” process of teaching and in this case, “how-to” implement mobile technology in HE. Within this approach, a problem is selected which is occurring in a classroom, while a group of teachers work to devise a set of strategies to solve the problem (Hinchey, 2008). In this thesis, I will be devising the plan and carrying it out.

Furthermore, it may not necessarily be a problem that is being studied but rather it can also be seen as a component that needs improvement in the classroom. This division of action research fundamentally asks the practitioner to come up with their own answers to what perhaps needs improvement in their class. Through this, the teacher/researcher becomes more conscious of what they are teaching in the classroom and the reasons behind a possible pedagogical change.
Moreover, the philosophical underpinning assumes that teachers will (1) be committed to their continued professional development and (2) be the decision makers and play an active role in choosing their own area of focus. Kemmis and Carr (1986) observe that, while a problem is being chosen and dissected, “the teacher/researcher also learns more about the process of reflecting” (Hinchey, 2008, p. 39).

This process of reflecting is a core component to action research. If this component is embraced, what we see is a teacher/researcher taking the time after the lesson has been taught to sit down with their own thoughts and debrief themselves on what they saw in the classroom, what was working, what was not working and why it wasn’t working. The potential results of this research project can help us explore how technology might be used in the classroom when teaching HE to students in Ontario elementary schools.

3.2 - Applications

There are four major apps that will be used in this research: Green Smoothie Game Lite, Fit Quest Lite, Lose It!, and Green Smoothie Full Version. I will explain all games in this section.

The first app, Green Smoothie Game Lite, is a game produced to educate its users on eating healthy. The app is geared towards a younger audience with its animations and main character being a squirrel, yet the developer does suggest that the game can be played by people of all ages. The app aims to educate its users about health education through two means. The first comes through controlling the squirrel. The object of the game is simple, the squirrel moves across on branch on a tree and catches items that fall down from top of the tree. Items that fall range from junk food, to random items like keys, to healthy food such as avocados. The user has
to make choices as to what are the best items to catch so that a healthy or “green” smoothie can be made.

The purpose of making a healthy smoothie is to help feed the other animals in the forest. The second method of educating the user is after the smoothie has been made, an ingredients list appears of showing the recipe of what it is needed to make the given healthy smoothie. The recipe list, may not be entirely advantageous to the younger audience as they may be more fixated on playing the game, while adults interested may enjoy the game and make use of the healthy smoothie recipe. Each level of the Green Smoothie app progressively gets harder, instilling a sense of competition in the user. If the user in the game does not successfully make a healthy smoothie they cannot attempt the next level. Moreover, the forest animals do not benefit from the smoothie and lose a chance to eat (Boutenko, n.d.).

The second app, Fit Quest Lite, centers around another squirrel controlled by the user. The squirrel runs its way across a course that traverses through territory where other animals may present themselves. In order to remain alive in the game, the user must jog, hop or duck in order to proceed throughout the level. To begin the user is always in a jogging state when moving the squirrel. The user must then duck if an eagle flies down to capture the squirrel with its talons. Lastly, the user must hop at certain points to get the squirrel over alligators or snakes in order to get back to the tree house. There are numerous different levels, which the squirrel has to pass through. The object of the game is to return back to the tree house, but for the user it is to engage in physical activity actions such as jogging, hopping and ducking (JogHop, n.d.)

The third app, Lose It!, is an app that is meant to keep the user healthy by monitoring their actions. The app allows the user to input their weight, caloric intake and exercise regiment. The user can set goals and monitor their daily calorie intake to help monitor weight gains or losses. There are numerous facilities within the app, such as through recipe building, a barcode
scanner that allows instant caloric information to become available, and a large food and exercise database. Lose It! connects itself the user in a few different ways. It is compatible with many exercise apps and wearable bands that record exercise data. It also allows the user to add friends and monitor their progress as well (FitNow, n.d.).

The fourth app, Green Smoothie Full Version, offers many more levels for the squirrel character to proceed through. When all the levels are completed, the app unlocks a new character whose intent becomes to properly recycle waste instead of create smoothies. This bonus level can only be accessed when all other squirrel levels have been successfully completed (Boutenko, n.d.).

3.3 - Context

The York Region District School Board is a growing school board that resides just north of Toronto. The YRDSB consists of approximately 80,000 elementary students, 4600 elementary teachers and 270 elementary administrators (York Region District School Board, 2012). The socio-economic demographic of this board is ever changing and encompasses a large spectrum of faiths, races and backgrounds. The implementation of technology in the classroom over the past few years has progressed from an idea that was non-existent to an idea that is implemented in many classrooms each day.

Since mobile technology has seeped into the psyche of many young adults and has trickled down to the youth that attend elementary school, I felt it was important to explore whether mobile technology is making a difference in the classroom or not. More specifically, this study will look at the technological uses within HE during two consecutive four-week periods. The first four-week period will consist of one practical action research plan carried out through a series of action research phases, while the second 4 week period will consist of a second practical action research plan which will operate differently from the first 4 week period.
3.4 - Overview of Phases

Kemmis and McTarggart (1988) discuss how action research has 4 moments that illustrate its process, 1) Planning, 2) Action 3) Observation and 4) Reflection. Within each phase, I will implement my own ideas of best practice, critique and reflect on them throughout the process.

3.5 - Phase I

<table>
<thead>
<tr>
<th>Plan</th>
<th>Time</th>
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<tbody>
<tr>
<td>Practical Action Research phase 1</td>
<td>1) Planning</td>
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<tr>
<td>4 weeks</td>
<td>2) Action</td>
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<td></td>
<td>3) Findings</td>
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<td>4) Reflection</td>
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<tr>
<td>Practical Action Research phase 2</td>
<td>1) Planning</td>
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<td>4 weeks</td>
<td>2) Action</td>
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<td>3) Findings</td>
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<td></td>
<td>4) Reflection</td>
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*Figure 2: Action Research Plan.*

*Planning:* During the 4-week period, I intend to make it through the four moments once on a weekly basis. This allows time throughout the week to observe and use the weekend to reflect on the actions of the week and plan for the next week of action. For the first phase, I operated
entirely outside of the given classroom periods meant for subject matter. In this first phase, the
data was collected primarily during the 20 minute lunch break that the students receive from
11:55 am to 12:15 p.m where they eat in their classrooms, after which they go out for lunch
recess.

In order to account for the time that students need to get their lunches and settle back
down into the classroom, I only observed and reported on actions that occurred within a 15
minute period from 12:00 pm - 12:15 pm. In the first week, I asked the students in my classroom
to volunteer by staying for lunch to play Green Smoothie Lite on the iPod Touches or iPads
while they eat. Although the classroom rules entail that food and technology be kept separate,
students were asked to wash their hands and only participate once done so.

Given that there are 12 students who stay at school to eat their lunch, there will be a ratio
of nearly 1:2 for mobile devices to students, excluding students who may have their own devices.
The first week of action may be an important predictor of whether the students like the HE apps
later on in Phase 1. As a result, I anticipated that numerous actions may result. Students may
gravitate towards playing the game and creating a sense of competition with others. Also, since
games are not permitted to be played in the classroom with the school’s technology devices, the
students may inadvertently be motivated to play any sort of game that involves using the iPod
Touches or iPads.

On the other hand, the participation level may be minimal for a couple of reasons: The
students will likely be hungry and want to sit down to eat their lunch; the other possibility is that
the apps/games may not coincide with the level in which they are used to with their own app or
gaming experiences. In this phase, the data collection method will be conducted solely through
anecdotal notes. Through these observational notes, the students’ comments, actions, behaviours
and reactions will be recorded and critically analyzed.
**Action:** That action that will take place in the first week and throughout phase one will be playing the game apps (Green Smoothie Lite, FitQuest Lite, Lose It, Green Smoothie Full Version). Green Smoothie Lite will be the first game to be played and was observed on a daily basis for one week. Subsequently each game was observed for one week. Aside from the students playing the game, I observed their physical activity while they play the game given that will demand movement, in addition to an increase in their HE knowledge transferred to them from the app. The latter has greater value as it translates directly back to the goal of this study. The extent of their actions were determined through the anecdotal observation notes.

### 3.6 - Phase II

**Planning:** During the next four-week period, the grade 5 students were taught health education through formal classes designated in their timetable. The grade 4 students will also learn health but will do so in another classroom with another teacher. As a result, only the grade 5 students will be observed and reported on. In the following weeks, I used the Health Ed Buddy app, which covered a number of topics. These topics included: Getting help and Death, Promoting a healthy lifestyle, School Safety, Your behaviour and reducing health risks, Caloric expenditure, Communicating, Eating disorders, Emotions, Injuries, Living a Healthy Lifestyle, and Mental disorders.

My teaching focus in phase II was taken directly from the Ontario Health Curriculum expectations. “C3.1 Media Influences - Food Choices” assesses how the students are able to understand how food is advertised with claims in the media. Since the Health Ed Buddy app did not coincide with the expectation I had chosen to teach, I was unable to use it at all during the second phase. Due to this, my plan changed prior to starting the second phase.
My focus shifted to using the mobile devices for the their native applications in order to teach expectation C3.1. Each HE class will be 40 minutes in length and only one class is scheduled per week. Since it is 40 minutes per week, this phase consequently requires less time compared to the total time per week the students received in the first phase (75 minutes).

*Action:* In the four-week period, the students will look at food print advertisements online. The students will access these online sources with the classroom mobile devices, using the Safari Internet navigator app. The students will analyze advertisements using worksheets provided by the Ontario Physical and Health Education Association.

The results were gathered and observations of the students were made as they worked through the tasks in the subsequent weeks. Towards the end of this phase, students began to work on a final project, which involved making an advertisement of their own using some of the advertising strategies.

### 3.7 - Participants

This action research study occurred in a single class with grade 4 and grade 5 students of mixed ability in an elementary school in the YRDSB (n=28, 10-grade 4s and 18-grade 5s). The class has an imbalance of males and females (n=28, 8 females and 20 males). The ages of the grade 4’s range from 8 years to 9 years while the ages of the grade 5s range from 9 years to 10 years. Additionally, I am a major participant in this study as the practical action research approach asks the researcher/teacher to plan, implement and reflect on the path that was taken during the teaching process. I have been a teacher within this school for 6 years, while all the students within the combined grade 4 and 5 class have been members of the class since the start of the school year (September, 2012).

During the 20-minute indoor lunch period, students sat down in their respective classrooms to eat their lunch with their classmates. The students that do not stay leave to eat at
home and return back to school any time within the hour. Those students that are at school are then sent outside for a 40 minute lunch recess break. Therefore during the 20 minute indoor lunch period, not all students are available to participate as some have left to go home. There are 12 students that stay at school and eat their lunches in the classroom everyday. These 12 comprise a balance of grade 4s and 5s (n=12, 6 grade 4s and 6 grade 5s).

3.8 - Data Collection and Analysis Methods

My research focused on collecting and analyzing information from student work samples and observations that may have an impact how mobile devices can be used to teach HE. Student work samples will be analyzed through worksheets created by the Ontario Physical and Health Education Association (OPHEA) and also by their oral responses during classroom discussion. Other content required such as PDFs, PowerPoint presentations, audio and video material are all viewable and accessible through the students Google Drive accounts.

The majority of the analyses was through my personal reflective journaling, which took place following each HE lesson. The journal entries are an integral component of the action research ethos. Through these journals, my teaching and practice informed and were adjusted in order to implement new strategies that will help to improve HE implementation and learning through the use of mobile technology. The decisions and realizations that are made through the action research approach may ultimately determine the level of instruction, and possibly the quality of student work with mobile technology. The student data, along with the reflective journaling, was analyzed qualitatively by looking at student’s written work alongside direct observation of the students as they work.

It is important to note that the information obtained from the students work for this research project cannot be analyzed solely by itself. The student’s demonstration of knowledge through their worksheets only provides a small glimpse into their learning. As a result,
analyzing only students work is not sufficient and requires further anecdotal observations of students as they may be able to demonstrate learning without tangibly using the technology.

3.9 - Materials

Within the classroom, students have access to multiple mobile devices that have been bought and shared amongst other students within their individual classrooms. There are 2 iPads, 6 iPod touches and one Macbook Pro laptop. These devices are accessible by any student in the classroom and require no login or password to use. To add to this, there are 5 students in the class who bring their own mobile devices to school so they can use them to assist with their work. This changes the totals for mobile devices in the classroom (N= 8 class devices; 2 iPads, 6 iPod Touches) and for student owned devices (N= 5 student owned devices; 1 iPad mini, 4 iPod Touches). With the added mobile devices being brought into the classroom, this provides an increased opportunity for each student to have an opportunity to use mobile devices in the classroom setting.

The health related apps that will be used from the Apple iTunes store include the following: 1) Green Smoothie Lite Game, 2) FitQuest lite, 3) Lose It and 4) Green Smoothie Full Version. Aside from these apps, mobile technology will be implemented during the HE lesson by using its more native apps such as Safari (web browsing), Camera and Video.
Chapter 4 - Findings

4.1 - Phase I

4.2 - WEEK 1 - Green Smoothie Lite

Phase 1 started on a Monday at the beginning of a four-day week. The Friday at the end of the week was a holiday along with the following Monday, resulting in two consecutive four day weeks. This phase of the study takes place only during a 20-minute lunch period, 15 minutes of which were recorded to allow the students time to settle in with the lunches. The setting was inside their regular classroom with their regular classmates who stay at school for lunch. Of 12 students who stay in the classroom for lunch, five are girls and seven are boys. All the girls are grade 5 students except one who is a grade 4. The boys have five being grade 5s and two being grade 4s. There was very little divide inside the classroom since the students from both grades sat with one another regardless of gender and age.

As the observational period began on the first day, a Monday, the children were unaware of my plan to let them use the iPods and iPads to play a game. When the lunch bell rang at 11:55 am, the students left the classroom to get their lunch from their bags in the hallway. By the time the students settled themselves back into the classroom, it was 12:00 pm. At this point, I asked one of the students to unlock the technology cart and take out all the mobile technology (6 iPod touches and 2 iPads).

When the devices were on my table, I quickly opened up the Green Smoothie Lite app on all of them and announced, while waving an iPod touch in the air, “Who wants to play a game?” Once I had made the announcement there were 3 students who immediately came up to my desk wanting to have a device to play with. Once that initial stream of students went back to
their desks and lunches to eat and play, there still remained six devices on my table. I felt it was best to get these devices into the hands of students as this would only aid my observations, while concurrently not forcing students to play as the idea of devices not being used was an observation in itself. I announced that there were more devices that were left over and that more students could play. After this second announcement was made, more students slowly made their way up to my table to use the devices.

Since this was the first day, it is entirely possible that students were caught off guard with my announcements given that technology devices are generally not used during lunch hour. But those three students seemed to be the ones that were eager game players and who enjoyed having a good time while playing games, perhaps especially video games. During the first day, all the mobile devices were in use, but there were a few times when students would return them after playing for a short period of time.

As the students began their game play of Green Smooth Lite, I observed enjoyment coming from the students in both grades. Students were jubilant as their Squirrel character picked up the correct healthy items that fell from the treetop. Students would say, things like “Yes! Yes! Yes!” or “This is easy!”. I also noticed how the aspect of eating lunch was certainly not forgotten. There were moments when students would pass the iPod or iPad onto a fellow classmate to give them a turn if they asked for it without hesitation in order to eat. It was great to know as a teacher that there did not seem to be any dilemma in sharing the devices when it came to playing games. The first day came to a close with an assortment of observations and the introduction of only one game.

By the end of Tuesday (day 2 of the phase I), the landscape within my classroom had changed. Not only were the students more engaged in playing the game, two students were so enthralled by the game that they were able to complete all four levels of the lite version of Green
Smoothie by the second day. This left me wondering what these students would do for the rest of the week. However, they still managed to play the games again even though they had completed all the level in previous days. Those same students also helped others if they had questions or encountered difficulties in playing the game.

On the 3rd and 4th day of the first week, many male students approached me to share that they had completed all four levels of the lite version of the game. These students then asked whether I would be buying the full version. When I had asked whether I should or not, the response was mixed. Of the boys that felt it was not necessary to purchase the full version of the app, which was $0.99, one of them proclaimed “get a new game.” When I asked that student why he thought that, he continued, “you don’t want to waste money on a bad game.” When I asked for the students who were in favor of buying the full version of the app the reasons behind this interest, their responses included: “its only $0.99”; “there are more levels to play,”; and “it was fun.” It was a challenge to make a decision on purchasing the full version but it had to be done in the fourth week in lieu of The Health Ed Buddy app due to the incompatibility between the app and my teaching focus (which will be discussed later.)

By the last day of the first week of phase I, students were still playing Green Smoothie lite. The female students who started out slow in accepting the chance to play had multiple chances to do so throughout the week. Some of the grade 5 girls were uninhibited in sharing their feelings about the game. One female, while playing numerous times in the first week, would shout out “who throws keys from a tree?”, “who throws a couch from a tree?” and “why throw a bike from a tree?”. It was clear to certain students that the logic behind the game was senseless in a way. They did not understand why some objects would be tossed down from the tree to deter or trick the player into putting it into their blender to make a smoothie. There were rare occasions when I would hear the sound effects of the wrong object going into a blender,
followed by a sigh of defeat from the student. Although that one female made those comments while playing, she continued to play and coach her friends throughout the week.

Throughout that first week there were only a few incidences where there were comments from two students about the realization of playing a game that had a health focus. Through my observations of student behaviours and listening to the mini conversations that the students would have while playing, it appeared that the majority of the students did not realize the game’s health implications or the ties to the health curriculum or the content already studied this year. That is not to say they were unsuccessful at playing, since as mentioned earlier, a large number of the students who played Green Smoothie Lite completed all four of the levels offered in that version, but rather that students may have been unaware of the larger idea underpinning the game.

Students did realize that it was only healthy items that allowed them to be successful in each level of the game and feed their fellow forest animal friends. Consequently, a short smoothie recipe would be presented at the end of each level the game, not of all the items that went into the blender but of one considered to be healthy. My students’ ages may impact their ability to connect and understand the smoothie recipes. Student over excitement and competitiveness may have been another factor that steered their thoughts away from the idea of why I might be allowing them to play this particular game.

There were many times throughout the week where they would ask to play another game. Subway Surfer was constantly mentioned and downloaded earlier on in the year by an unknown student and then deleted by myself for its lack of educational value. I frequently informed the students that they were not allowed to play any game other than Green Smoothie Lite. For most, not being permitted to play other games did not seem to deter them very much. They may have been bored of Green Smoothie Lite after playing for a short time, and as mentioned earlier, this
possibly resulted in them returning the mobile devices to me or passing it onto another student. By the end of the first week of playing this game. The students enjoyed using the portable devices while playing the first game. However, I did not witness authentic learning transpiring.

4.3 - WEEK 2 – Fit Quest Lite

In the second week of phase I, I decided to move onto a different game, since most indications pointed towards needing a new app/game for the students to play. I could very well have continued to play Green Smoothie Lite in the second week, and I think at the very least some of my students would still want to play it. However, I thought that a second week of that same game might leave others who enjoyed the gaming experience a little turned off from the devices or from that game. As a result, I felt the second week was a good time to start a new game for the students to continue their enthusiasm for playing and using the devices.

That Monday when I announced, “Who wants to play a new game?,” at least twice as many students came running up to my desk, hoping to obtain an iPod touch or iPad. The fact that all of these excited individuals were all males tells me a little bit about who might be more inclined to use a mobile device at that age level. On the other hand, throughout the second week the female students did have many opportunities to play and made requests to play games on the devices when they became available.

Before presenting the devices to the students, I deliberately loaded the app on the device in order to circumvent any chance of students being distracted by other apps or settings preventing them from playing the game that I tasked them with. I asked the students to begin by reading the initial instruction page before continuing with the game so that they were aware of the games’ rules. This ensured that the students played the game the way it was intended to be played. I proceeded to show these students the short instructions on how to play and began modeling one of the game’s levels for them to ensure their understanding. As I extended my
hand forward with a device still simulating the first level, I asked the students if they understood how to play. One eager student who had been the first to finish all four levels of Green Smoothie Lite, swiftly removed the iPod from my hand by replying with “Yeah, I get it,” turned around and continued to play the first level.

Following the distribution of the iPods and iPads, many students who asked exactly how to play the game or what the point was. I walked over to a few students in order to explain the premise to them as well as how to play with more clarity given their eagerness in getting started. The other ambivalent students observed the first student who started playing and who quickly grasped the idea of how to play the game. This student identified as S1, was very active in his movement, bouncing around the room, jogging while jumping and ducking simultaneously. The other students in the classroom who did not volunteer to participate in FitQuest Lite were captivated by S1 and his kinesthetic actions. This subsequently prompted their interest in identifying what it was that he was playing. The task of looking at S1’s screen was not an easy one. Given his swift active movements, the students only caught a glimpse of what it was that he was playing, just before he jogged away, jumped or ducked, further obscuring the view of these onlookers.

On the other hand, all of the females in the classroom remained indifferent and did not ask to play. Furthermore, after an iPod was returned to my desk, I asked the class who else wanted to play given that a device was returned. Although numerous boys volunteered, I decided to select a female student instead who did not get to participate during the last 15 minutes. This female student obtained the iPod and asked if she could play Green Smoothie Lite. Without hesitation, I concurred. Throughout the week, I observed this female student who decided to play Green Smoothie Lite a few more times throughout the week with her female counterpart at the lunch table.
As the second week of phase I moved forward, the females preferred to play Green Smoothie Lite over FitQuest Lite. The males were always eager to play both games, more so FitQuest Lite. The males played rambunctiously and actively creating the physical movements that they wanted their character to embody. When I examined my anecdotal notes for themes, a prominent recurring observation each day was that of students playing FitQuest Lite while engaged in various kinesthetic activities (i.e. jogging around the class while jumping and ducking). Seldom would I observe students jogging in one place. They felt as though they had to move around to keep their character moving in the game.

Their actions I was playing a joke on them in an attempt to propel their various movements throughout the classroom. In fact, during the first day one student proclaimed, “Hey look, people are exercising.” It could have been taken as a joke but there seemed to be some realism to her comment. Given that the participating students were exercising, this particular students’ observation reinforced that some students were cognizant of the game’s physical education components. The only hint I gave to the students was that I would pass the game to other students if existing players were found sitting and not displaying the games’ required movements.

Two students in the class compromised the authenticity of the game. Both of these students owned iPods at home and were familiar with how the accelerometer worked in games involving movement. These two students would sit at their chairs quietly and rather than move themselves to jog and jump, they simply would jerk the iPod up and down while vibrating to simulate the running of a person. It was eye-opening to see how these two students knew how to use the accelerometer in the iPod to think they were actually performing the movements with their entire bodies.
These two students who were able to trick the accelerometer conveyed a strong message through their actions that games may be played with and without extracting the true purpose behind them, prompting further questions about the disadvantages of mobile technology. From a teacher’s perspective, it could be easily argued that the two students who sat while playing FitQuest Lite were generally inactive (i.e. frequently selecting to opt out of physically activities during physical education classes). What was unsuccessfully measured were the students’ abilities to comprehend the larger messages surrounding health. Although their understanding was not the central focus of the study, it was hard to decipher whether this message was being conveyed or not. These observations were also characteristic of the students in phase I.

Overall, the participating students took the game seriously performing the correct actions required by their characters. During the second week of this phase, their resilience persisted as they were engaged and excited about playing games with a health related focus. This uncovered signs of potential success springing from this study.

One other feature that continued into the second week was the importance that the students placed on their lunches while simultaneously playing their games. As the excitement amongst the students increased, they always managed to eat and finish their lunches. The only conflicting indication of this observation arose on Tuesday and Wednesday when S1 and another students stayed just after the lunch recess bell to complete their games. When the devices were taken away, only then did they consume their lunches. Overall, each student that played mastered a perfect balance between playing the game and eating their lunches.

This game displayed signs of varying potential. One student, who during the prior week did not make an attempt to play Green Smoothie Lite, was actively playing FitQuest Lite with the other students. This student did not receive the same amount of playtime as the other students did. However, whenever he had an opportunity to play, he would with enthusiasm.
There were no other students who manifested this same level of enthusiasm. He played at a level where he was almost posing danger to his other classmates jumping high in the air and running at a high speed around the classroom, while everyone else ate. Given that his energy and athletic ability is usually dormant, the game may not have provided him with a venue to release his energy in a positive way during his lunch break.

When the week came to a close, I noticed a high level of student interest in playing this game in comparison with the first weeks’ game, Green Smoothie Lite. As students completed this game, there was very little, if not any, conversation about a continuation or full version of FitQuest Lite. Upon looking into this matter a little further in order to consider providing the students another week with a full version of FitQuest Lite, I noticed that the developers of this game had not made a full version of it. Consequently, I had to adhere to my plan of a 3rd game application on the iPads and iPods to test out in week three of Phase I.

4.4 - WEEK 3 - Lose It!

When the week began with the introduction of Lose It!, I clarified the game’s instructions by telling students that this app was straightforward and that we would be measuring and recording their weight each day. Immediately, I heard a student ask aloud whether it was a game or not. When I responded by saying “No,” another student quickly asked, “Can we still play the other games?” to which again I responded with the same answer. I could tell they were visibly disappointed. No one explicitly stated that they had fun during the previous two weeks, but by their body language and enthusiasm, I could easily conclude that they enjoyed the game. The students seemed to have made a decision that since the new app was not a game, they would not have any fun and therefore did not feel the need to participate so enthusiastically as they did in previous weeks. After the initial hush that fell over the students staying for lunch passed, I asked again, “Who wants to record their weight?”
I began by displaying the seven iPod Touches to students. There was no sense of urgency from the students to play, as had been demonstrated every day for the past two weeks. Two students slowly raised their hands and approached me asking to record their weights and use the app. I was observing the girls while they began to eat their lunch and I could hear their initial conversation was about whether some of them should use the app or not. The conversation was more about, “Should I do it”? and “Should I get the iPod?” rather than “Should I share my weight?” Finally, on the first day, after five minutes had passed, two of the boys who volunteered to try the app had recorded their weight and inputted it in the app, followed by 1 girl who decided she wanted to try it out.

The week progressed slowly with only one more male student asking to track his weight on the app on the second day of the week. By Wednesday, there were three males and one female still tracking their weight on Lose It!. That day, the lone female decided that Wednesday would be her last day to track her weight. She approached me and said, “Mr. Khan, I don’t want to play with this app anymore.” I said that was no problem and thanked her for telling me. The three males continued the app until the end of the week. On Friday, I showed them how their weight in all cases did not change over the span of five days. They were not entirely impressed but at the same time, neither was I. This brought an ending to an uneventful week for the students in my class who stayed for lunch at school hoping to play a more enjoyable game.

Nothing seemed to resonate enough within the students as the previous two games did. There appeared to be no real health benefit from trying out this app and there were no health lessons that student’s took away from this app. They only saw it as an app that could record weight over a period of time. It appeared that recording ones weight over time, viewing it, setting goals, etc. was really what this app was meant to do, rather than directly or indirectly inspiring messages around health promotion.
I have observed that when students enter the intermediate grades (i.e. 6, 7 or 8), any discussion about weight becomes a personal issue that few are comfortable talking about. At the grade 4 and 5 levels, when I approached this issue earlier in the year, the most frequent response I received from the students was that they had no idea what they weighed. Once we went through the stages of gathering each student’s weight, the students were relatively comfortable with writing their weight down on paper and disclosing it to their classmates. Months later, only a few of these students decided to use the Lose It! app.

4.5 - WEEK 4 - Green Smoothie Full

The fourth week ignited a resurgence in the grade 4 and 5 students that stayed at school to eat their lunches. Once I announced that I had purchased the full version of Green Smoothie, many of the students were eager to participate, particularly the males. Over half of the boys rushed to my desk hoping to get an iPod or iPad to play the game. I randomly chose which boys would play the game in hopes that they would remember to pass the game on to others upon completion. Once the devices were all out, immediately the eagerness of the students resurfaced as if the third week of Lose It! never existed. To illustrate, when the second day was nearing to a close, S1 who was in the middle of an epic moment in his game play, paused the game and politely asked he if could stay a few extra minutes after the lunch bell had rung for recess to finish a difficult level. S1, along with other students, maintained this eagerness throughout the week. By Thursday, S1 and one more student completed all the levels to the point where they had unlocked a new character in the game. These were the additional levels that were hidden from the other players and could only be accessed by those who completed the game.

Midway through the week, three girls decided to challenge one another, however it was not with the Green Smoothie game. Instead, the girls each obtained an iPod Touch and opened up the FitQuest game. The girls stood in an open area of the class and waited until everyone was
setup and ready to go. When they counted down, they began to jog, hop and squat on the spot. Their movements were almost synchronized considering they were all playing their own games, yet they stayed in the same spot within the classroom without moving around similar to how the boys had been. These girls continued this style of synchronized competitive gaming throughout the rest of the week.

Student engagement with Green Smoothie Full lasted the entire last week of phase 1 without complaint, mention of the level of boredom or without changing the game despite the example of the girls playing FitQuest Lite in the latter part of the week. Although the excitement remained, in the last week, it felt no different from the previous three weeks. Teaching health education through these game-playing tools demonstrated a few glimmers of possibility throughout the four-week phase. The students’ ability to be physically active while playing the games was also consistent. The exceptions to this were those students who realized how to play a game without having to stand up and be as active as everyone else. Although only two students managed to participate like this, the overall physical activity level of the students during the lunch period remained active. However, the physical activity engagement and participation was not the focus while observing the students. With the conclusion to phase I, my focus turned towards phase II whereby a more formal educational approach would be taken towards teaching health education through the use of mobile technology.

One point that deserves highlighting was just how excited the students became when they were enjoying the games on the devices. Upon completing a game, they would put down their devices and pass the devices on to other students within a single 15-minute period. I could see two reasons why a student would give up their device instead of continuing to play: 1) wanting to eat their lunch and 2) boredom of the game. Lunchtime is an important break that the students receive each day. The first break they receive is at 9:55 am and is called a “snack
break”, during which time they get a chance to go outside for 20 minutes upon completion of their snack. During their lunch break, they received 20 minutes to sit in their class to eat their lunch. When the lunch period begins, most students are eager to eat their lunches. As a result, students who played the games, had the instinct to want to eat at the simultaneously, some of whom put the devices down or passed them onto other players to resume their lunches, while others simultaneously ate and played.

4.6 - Phase II

4.7 - Introduction

The second phase of this research encompassed a traditional in-class teaching approach to determine how mobile devices may be used to teach HE. The amount of time officially designated to teach HE each week was 40 minutes, it was held each Wednesday. Comparatively, this was only a fraction of the time they received in phase I during their lunch break throughout the week (75 minutes per week). During the 40 minute HE period, I would instruct only the grade 5 students in HE, as the grade 4 students would leave and attend their HE class in a different room with a different teacher.

My intention was to use the best HE app that I encountered (Health Ed Buddy) within my HE instructional time to see whether it might act as an appropriate means to teach HE with mobile technology. Change was required in my plan of action leading into Phase II. The Health Ed Buddy app had a select number of health related topics that it could serve as a teaching resource for. These topics included: Getting help and Death, Promoting a Healthy Lifestyle, School Safety, Your Behaviour and Reducing Health Risks, Caloric expenditure, Communicating, Eating disorders, Emotions, Injuries, Living a Healthy Lifestyle, and Mental Disorders. The change of plan occurred due to the limited topics that this app contained. My
teaching focus in Phase II was around the Ontario Health Curriculum expectations I had planned to teach at that point in the year, “C3.1 Media Influences - Food Choices”.

Though, topics in the app including Communicating, Living a healthy lifestyle and School safety align with the grade 5 health expectations, the content and material for teaching the Media Influences Ontario curriculum expectations were unavailable. Consequently, the only next step was to resort to traditional means of using the mobile technology to help facilitate teaching and learning.

The Health Ed Buddy app was eliminated from the plan and was replaced. Over the four-week period, I intended to use the mobile technology for its native apps and traditional uses that included Safari (for web browsing) and Camera (for taking videos and pictures).

4.8 - WEEK 1 - Health Education Class

The first week commenced with the use of the mobile devices as I instructed the grade 5 students to visit a few websites on their mobile devices. These websites were written on the whiteboard. These links showed food print advertisements that were geared towards junior level students. During the HE class, the students looked through a number of the advertisements with a partner on their mobile device, chose a few advertisements, and rated them according to which appealed to them on a personal level. A worksheet provided by the Ontario Physical and Health Education Association (OPHEA) was printed out and used for the students to record their advertisement ratings and explanations.

During the class, there were a few students that asked if they could look through some magazines to see if they could search for more advertisements. There were magazines available that those students did use after using their device. For the majority of the period, the devices were in perpetual use as the students searched the advertisements through the Internet using the Safari browser. This concluded the 40-minute HE class.
**4.9 - WEEK 2 - Health Education Class**

In week 2 during the one HE class on Wednesday, the food print advertisement ratings continued and were shared. The mobile devices inside the classroom (5 iPod Touches and 2 iPads) were in full usage by the students as they went back to the link to complete their task and worksheet. The students re-visited the website from the previous week continuing from where they had left off. When the time had expired for working on the task, the grade 5 students put their devices down and began to share their rating results with the entire class. By the time the results and ratings had been shared, the class had ended and the mobile devices were locked away for the next day.

**4.10 - WEEK 3 & 4 - Health Education Class**

In week 3, the students were asked to investigate the strategies underpinning the advertisements as opposed to rating them. During the 3rd HE class of the second phase, students spent time looking through more advertisements online using another online link which they were easily able to access with their mobile devices. Time was also spent away from the mobile devices when students investigated different strategies, tools and techniques and used food advertisements to capture the audiences’ attention. In terms of the mobile technology usage, student attitude and behaviour towards the technology seemed no different from any other time that they had used their devices both within the classes and across subjects. At this point in the year, my feeling that they had become rather comfortable with the usage of the technology for its basic apps and features (i.e. Safari and Camera).

During the fourth week, student use of mobile devices subsided. This stemmed from my introduction of the next HE project to the class where we discussed the criteria surrounding the
creation of a food advertisement for their own health product. The remaining class time was used for planning their projects.

In the subsequent weeks that followed the conclusion of phase two of the observational period, some of the students began using the Camera and Video Recording apps for creating commercials to promote their products. Once students completing filming with the Camera app, they began editing their advertisements using the iMovie app located on their mobile devices. The process of filming and editing through the mobile devices was an observation that nearly mimicked that seen during the most engaging moments within Phase I. The students had the opportunity to film a component, make mistakes, view it, receive oral feedback from classmates, and re-film their sections in a matter of minutes. The responsiveness, luxury, ability to save time and make a project implicitly enjoyable were all features I observed students enjoying when using the mobile devices. Although they were working on their project, no formal HE instruction was administered since it was time for the students to demonstrate their knowledge of food advertisements.
Chapter 5 – Discussion and Conclusions

5.1 Discussion

Using mobile technology inside the classroom came naturally to me given my role as the Technology Lead Teacher. Although I was able to implement the project in spite of the scarcity of mobile devices available, I found it more of a challenge when using mobile devices, which lacked appropriate applications and direct ties to the Ontario Health Education curriculum expectations. My experiences concur with Reid, Kervin, Vardy and Hindle’s (2006) and Kleiman’s (2000) suggestion that successful technology usage comes more from preparation and support of teacher implementation rather than just being able to use the technology.

During the time that the observations were being conducted, I had many thoughts with respect to the use of technology as a teacher inside the classroom. This emanated through my teaching experiences, students concerns and technology usage in general. Some of the major themes and patterns that emerged from the observations stemmed from how easily the students adopted the mobile devices for multiple uses. Additionally, it was interesting to note that the mobile devices were more sought after when it came to using them for gaming or when personal enjoyment was at a high level. The level of enjoyment corresponds well with Kmita & Davis (2004) claim that students are overall happier when using technology. The level of excitement days prior to implementing the technology during this study was in contrast to their level during the study.

Students almost always readily responded when the mobile technology was introduced in class as evidenced by their continuous engagement when utilizing the mobile devices. If I had...
not established any order in the classroom with rules, expectations and regulations, then more often than not students would easily run to the technology cart waiting for it to be open.

The rules and expectations of technology in my classroom gives rise to another important experience. In every classroom throughout the school there are technology expectations that are laid out by each teacher that encompass the appropriate usage of technology at school. Part of these rules involve understanding that technological devices, whether owned by the school or by individual students, may only be used to support class work. There have been a few instances throughout the year when students are unable to adhere to these policies and are caught using the technology for alternative purposes.

Once routines were established and mutual understanding of appropriate technology usage was understood, promising usages of mobile technology manifested. Simple tasks like researching, taking photos or videos and reading content were all general purposes that I saw work quite effectively while teaching HE. During health classes, the students had no quandaries about using mobile devices properly. Mobile devices appear to benefit classrooms stemming from their speed and ease of use. The second floor of our school has two computer rooms referred to as “pods”. These pods both house ten desktop computers that need to be signed out in advance in order to be used by classroom teachers.

If students play games or even mobilize themselves to use the pod computers, valuable time is wasted from traveling to the pod and logging into the school network system. The mobile devices used in this action research project contrasted with issues around these desktop computers since students were able to access and navigate through them with ease. Lastly, even if there are only a few health apps that may help teach certain content, the mobile devices may still be used to easily look up and access other pertinent information through the web browser on the device.
Playing games provides other promising uses around mobile technology. Traditionally digital games could only be played on the desktop computer, however as previously mentioned, time is saved by using mobile devices. Although the Internet provides copious amounts of educational games, perhaps more so than the Apple iTunes store, there is an advantage to downloading games for mobile devices. Whether it is for Android devices or Apple devices, viewing a list of games and deciding which is best based on the game description, screen shots and user reviews all serve as major advantages. With what seems to be a rise in students owning a mobile device, it may be more feasible for students to play games portably then on a stationary computer.

There was no single app or game that was able to measure up to my expectations of the use of mobile technology in the classroom, but more importantly for health education. Although each app had a positive side, it was outweighed by what the app lacked. The games were all meant to be games, regardless of the health focus and seldom coincided with the Ontario Ministry of Education’s Health and Physical Education curriculum. Perhaps adding a component to the apps that allowed the student to respond to a question or task in order for them to move on to the next level may have provided some authenticity to the message being conveyed.

The process of searching for an app or game that had larger health messages proved difficult. The iTunes store is replete with over a billion apps and games. Searching for apps regarding a specific health subject was less challenging. iTunes itself has managed to input in a few clever search functions. Once I completed my search for health related apps, sifting through the thousands of apps and narrowing them down to those which pertained to the grade 4 and 5 Ontario curriculum was a challenge. For Phase II, I was looking for apps that were content heavy and complemented the curriculum expectations I was trying to teach. Even with the user
reviews, search functions and numerous apps, searching for the most suitable app proved to be nearly impossible.

I found that the apps that I did find seldom adhered to all of my criteria. As a teacher, I had plans to teach a certain concept and wanted apps to facilitate my lessons. Some appeared to have potential but had little worth in the end. For each app and game that I had chosen to use in my research, the content was often characterized by breadth and not depth.

Not all of the games captivated student interest. For example, prior to entering into the third week of Phase I after selecting the apps for this project, my immediate hesitation surrounded the Lose It! app. This type of app had very little connection to the development characteristics of grade 4 and 5 students. After playing two game apps, I predicted that there would be a good chance that the students would lose interests in such an app. The students enjoyed playing games that were entertaining. Lose It is not categorized as a game, but rather a health app. I intended to steer in this direction because my topic focus was health. I felt that the students might make connections between the weights that they may gain corresponding to the unhealthy food that they may be consuming, even though this was never the case at any point during my observations. This contradicts Hu et al.’s (2003) notion that the perceived ease of use of technology has a minor effect on teachers’ ability to use technology. Instead, the perceived ease of use had a major effect on me. This propelled my whole idea to use the games and apps to support the teaching of health education. Unfortunately the ease of use was so high that the games and apps, as mentioned earlier, never lived up to their potential.

Secondly, unlike the previous two apps, there was no “fun” element to this app. It was simply a matter of weighing yourself, recording the figure and tracking throughout the week. Third, as mentioned previously, time can also be a pivotal factor underpinning the level of enjoyment. From what I was able to discern over the first two weeks, the longer the students
were engaged in a game, the longer their level of enjoyment was sustained. Lose It! did not seem to have any sustainable qualities as it was a quick record, save and track your progress which can easily take seconds to complete. The simplicity required in using this app lends itself to be largely unappealing to grade 4 and 5 students.

Lastly, since there was no character to feed, levels to finish, points to gain or rewards to win, I was concerned that students may not view this app as they did the others. Therefore there was no incentive for them to share their weight, track or even concern themselves with what happens to their weight. There was no substantial health benefit from trying out this app for a week, nor were there any broader health education lessons that emanated from the app for this particular age group. They merely saw it as an app that could record weight over a period of time. I seemed that recording one’s weight over time, viewing it, setting goals, etc. was really what Lose It was meant to do, rather than to directly or indirectly teach HE.

Moving into Phase II meant that I had more time to plan how to use the technology while teaching HE. The worksheet used for the students to describe and rate their food advertisement was a digital PDF document and could have easily been edited and worked on by kids with mobile devices. However, I chose not to for the sake of simplicity. I did not attempt to have the students multitask with the mobile devices all year and subsequently did not want to try to do so late in the year give that the report card completion deadline was soon approaching.

The devices were used for the majority of the time in our Health class because the students had prior experience with them. In my classroom, the mobile devices were utilized on a regular basis for multiple purposes ranging from accessing documents on Google Drive, editing documents, providing feedback, taking pictures, videos, and viewing websites all of which agrees with Lai et al’s (2007) notion of technology becoming ubiquitous and making great affordances for students. Students were adept with how to maneuver around an Apple device
since our school had been using them for two years and since Apple devices were compatible with the technology most students had at home.

As documented in the previous chapter, there were only a few instances when students were found not using the devices for their intended purposes. The majority of the time the students in these two grade levels used the mobile devices for their appropriate usage that seems to make them purposeful inside the classroom. Perhaps the ascendance of Apple devices gives rise to increased student usage, whether at school or away from school, thereby removing most of the allure and distraction away from the devices, not flawlessly though. Through my observations, the more comfortable the students were with the devices, the less distracted they were. Outside of the regular observational periods (Phase I and II), it was mostly the students who did not have a lot of exposure to the Apple devices that wanted to spend more time exploring the devise itself more, but this was a moot point in all of the observations.

Using the devices during the lunch period certainly came with disadvantages. It was not very fair of me to ask students to participate in educational activities during their lunch break. The lunch break is a time for the students to relax while they eat. At the grade 4 and 5 level, never did a student say that they did not want to play any of the games while others were playing. As described in the observations, many students waited for lunch so they could play one of the games.

The real disadvantage was that I could not expect very much from the students during this time. I could not ask the students to sit down and focus on the game, as it was more their time than it was mine. Since lunch time is a relaxed time, the students rarely took the gaming seriously to the point where they asked thought provoking questions surrounding the larger objective around the games (i.e. health messages). Teaching HE during this time may not have been the best strategy and I would not conduct research during this time again if I had to.
5.2 Conclusions

This study investigated possibilities of whether mobile technology, such as Apple iPod Touch’s and iPads, may be used to help teach health education at the grade 4 and 5 levels. Research has shown that the use of mobile technology has a positive impact on student learning in the classroom (Scardamalia & Bereiter, 1996; Wenglinsky, 1998). It can also help teachers in aiding classroom instruction. The ease of text messaging, social networking and video calling are all factors that may help facilitate student learning. As it relates to content sensitive issues in health, mobile devices have proven to be an option where health messages, consultations and monitoring may be of benefit to young students.

The purpose of my research was to examine how apps and games available in the iTunes store would provide the opportunity to aid my teaching of health education in my grade 4 and 5 split classroom. My initial focus explored the landscape of health applications in order to identify those apps with strong health messages, which proved to be a challenging endeavor. I would find myself encountering significant difficulty in searching for the best apps complementing my focus. It seems there really is no app with the one-size fits all approach. My plan was to divide my research into two phases: The first phase examined how health games could be used to communicate health messages to students and the second phase investigated how mobile technology could be used in a more formal classroom setting to teach health education. Both phases showed signs that mobile technology can potentially aid in teaching HE.

The first phase seemed more captivating for the students since it involved games that that particular age level enjoyed. The health games provided a gateway into health content as an educator. The students were hooked on playing but the health messages did not seem to penetrate as students were unable to identify the broader health messages. The specific gaming apps were limited with their message and purpose. If I had used other apps that did not revolve
around a game but were more content driven, it is quite possible that the health message and content could reach the students more easily. Other possible apps that are interactive such as quizzes, game show related apps or just strictly content focused apps such as the Health Ed Buddy app but more versatile in their design, may have had a greater teaching effect on the students.

The second phase was conducted in a more formal learning classroom setting with more of a focus on learning health content. In spite of the fact that there was no appropriate, specific iTunes store app for this phase, the mobile devices were used largely for their native apps that included navigating the Internet and taking pictures. This phase showed the most promise in teaching health education. The devices assisted in maintaining student engagement during the learning and did seem to help in teaching HE inside the classroom.

The engagement was in large part due to the native apps in the Apple devices, which provided more versatility for the students to explore health content. I found that the students were able to use a simple app like the Camera app for multiple purposes. Students could take pictures of their work, save it and upload it. They could create a photo essay of a specific health topic. The possibilities that a simple camera app offered were endless. Another extremely powerful native app was the web browser, Safari. With the web browser the students were able to browse particular health websites, read content, save websites, contribute and collaborate on writing documents and sharing answers. There was virtually no learning curve with both of the Camera and Safari app, allowing the students to obtain more knowledge through these standard apps. Although, as suggested by Liu et al. (2003) if I had received more training and support for the usage of these apps inside the classroom then as the teacher I would have had more possible usages from them.
In order for the research to have had a greater impact, my search for apps needed to be much more in depth. There is a vast number of health related apps in the iTunes App store and a great deal of time would be needed to search through the array of apps. If this study were to be conducted again, I would recommend more time to look for apps but also to choose apps that focus more on health content. Games seem to only accomplish a small goal in delivering content to students. The more content they are able to access, the more capacity there is to learn. The type of games that may have a greater impact are those that have a clear purpose and message. Green Smoothie’s message was covered by layers of gaming and recipes. FitQuest’s message was almost non-existent in the app itself. Although these games required the user to make decisions, games can have a greater impact if the user is invested in the outcome of their actions in the game (Baranowski et al, 2008). Consequently Baranowski et al.’s argument did apply to any of the games as they lacked in the capacity for the user to be making important decisions. In order to possibly invoke a greater understanding for the students in the game, the user has to think more about what is happening in the game and how they are able to control it. These types of games either cost more money, or are hard to come by.

The games looked at in this study lacked in the capacity to convey a message or teach anything effectively enough. Another recommendation is to harness the power of the natives Apple apps, built into the devices already. These apps have multiple purposes and can accomplish much more than simple games or health apps. The generalizability of the native apps opens a wide range of possibilities for teachers to teach within and students to learn from.

Health educators and teachers need to be aware that there is no one solution to using mobile technology to teach HE. There are always new apps that are being developed which serve a better purpose then the last one developed. In the field of HE, it is likely that more than one app is necessary to effectively use it as a teaching tool. The curriculum in Ontario for HE is
extensive and ever changing that a number of apps are needed to come close to achieving the expectations in the Ontario Health Education curriculum. Educators may even be doing a better job of teaching HE without the use of mobile technology, which is why the apps have a lot of ground they have to cover in order to be effective. As a result, educators will have look hard and be critical about the apps they choose to see if they deliver the content, message, goal that is tied to the Ontario curriculum expectations.

Time as a teacher is a valuable variable. A teacher is always in pursuit of accomplishing as many expectations as possible before the end of the school year. My experiences have shown that sometimes when teachers are provided with a new tool, they are reluctant to use it because of time restraints. The apps discussed in this study were not worth my time to be using inside the classroom, except the native Apple apps. If more time is given to these apps, to teaching the content and focusing on what is really happening in the game then it is possible to use them to obtain some gain. Possibly even create long term change in behaviours as suggested by Lin et al. (2006). Educators should also be aware that a great deal of time is needed for that to occur on top of the time needed to find, dissect and use new apps. In some apps the content is limited which is why it may be easier to find and teach content without using apps. I would suggest that content related apps are better than games, depending on the content app. The more apps that are used to achieve certain expectations, the more time it will take to invest into those apps. Time that many teachers may not have.

Ultimately, numerous factors contribute to whether mobile devices can help teach health education. But the potential of mobile devices to help convey health education messages to students is limited at the grade 4 and 5 level. Although, it is important to note that mobile technology can serve as a useful vehicle in teaching health education provided that there are effective tools in place (i.e. apps, training) to support its usage.
References


