THE USE OF TECHNOLOGY INSIDE AND OUTSIDE THE SCHOOL AMONG KUWAITI STUDENTS AT THE INTERMEDIATE EDUCATION LEVEL

By

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Dr. Khalid (Dad), I dedicate this work to your memory. From you I have learned the benefits of hard work, how to forgive others as myself, and the joy of life worth living. Your loyalty, devotion and love lives through me. I love you.

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ABSTRACT

Today's education is different to the one that existed not so many years ago. Our education is constantly changing. We live in an information society where the leading role has been given to new technologies, especially those devoted to information. Therefore, this study will attempt to understand Kuwaiti middle schools students' perceptions of technology use inside and outside schools, particularly students' impressions of educational technology.

The purpose of this research study was to determine are their differences between how technology is used in and out school by grade level and gender. The instruments were two questionnaires called a survey of technology usage inside school and a survey of technology usage outside school. With 20 items in each instrument. All the students were 11 to 14 years of age, at four intermediate education levels: sixth, seventh, eighth, and ninth grade. The total sample size was N = 384 (185 boys, 199 girls). This study was conducted with grade sixth, seventh, eighth, and ninth for both schools, students in intact classes.

The most strongly endorsed technology item inside of school were educational in nature. Whereas, outside of school students developed more recreational purposes of technology use. The inferential statistics showed an interaction between gender and grade level. Technology inside of school found a low level in grade six and rising in grade seven for girls while it rose for boys in both grade seven and eight. Both boys and girls utilized technology in school less in grade nine.

Technology outside of the school found the same results as inside for boys while girls started higher in usage and declined each subsequent year. Girls utilized technology for more educational purposes than boys.

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CHAPTER I

INTRODUCTION

The rate at which technology has advanced has drastically changed the manner in which people interact with one another, acquire education, do their work, and how they spend their leisure time. The advent of computers and information technology has evidently revolutionized almost each and every aspect of the day to day living thus determining the place and manner of obtaining news, the way goods and services are ordered, and also how communication is conducted. It is reasonable and anticipated that technology needs to also assist in leading the way of improving the manner in which learning and teaching is done in schools. Moreover, it is realistic to believe that incorporating technological opportunities in education will greatly assist in leveling the playing field even at the intermediary education level and specifically across the grade and gender levels (Noeth & Volkov, 2004).

Through technology, new learning and teaching methods may be obtained. At the same time, technology offers modern ways of holding everyone involved in education to become transparently accountable to communities, parents, and the learners (National Research Council, 1999). According to the National Academy of Sciences, emerging and latest technologies have the potential of enhancing learning and knowledge development in various exciting ways through the provision of accessibility to a wide range of information to other stakeholders with regard to information, their responses and inspiration inside and outside schools (National Research Council). However, in spite of such promises, there is wide range of evidence with respect to technological effectiveness since it relates to issues of achievement and educational equity (Barton, 2001, Cuban 2001). One of the crucial goals of the No Child Left Behind at is the enhancement of education through technology with particular emphasis on what really works in applications of technology (U.S Department of Education, 2000). In relation to that, the (Revised Plan of National Technology, 2001) particularly calls for empirical studies to be conducted in and out of schools which are designed to determine effective technological uses under what conditions and with which types of students.

Technology has become a significant tool in influencing students' attitudes, learning and achievements. According to Abrams, Lockard, and Many (1997), technology is an inevitable change component that is now affecting the United States education and the entire world in general. Moreover, learning and teaching are difficult objectives to achieve, but through computers, new and effective ways are opened for working in order to have these goals attained. Technology is a good tool that provides an environment where students virtually apply tools as they would in real life. For many years the use of technology in the education sector has displayed a notable rise in most countries (Collins & Sakamoto, 1996). In the public schools of the U.S for example, the student numbers for every computer increased to 9 per computer in the school year of 1995/96 from a low of 125 students during the school year of 1983/84 (Data of Quality Education, 1995). In spite of the technological use increase, there are still important questions to address. For instance, in integrating the curriculum or extending methods of instructions, what is expected of educators with respect to technology? The basic question has changed from if, to how, technology should be used (Lockard et al., 1997).

Kuwait is a country that is modernized and in many aspects of Kuwaiti's life, technology is applied. It is used in offices, banks, hospitals, shopping centers and homes. According to HajIssa and Sadoun (1993), decision makers at the Ministry of Education in Kuwait (MEK) have appreciated the significance of using technology in education. MEK examined other countries' experiments with respect to technological use in their institutions of learning. From those countries, they adopted what was suitable for the Kuwait environment and what was appropriate in improving outcomes for learners. Technology was firstly implemented in the school year of 1985/86 in four secondary schools for purposes of teaching courses in computer literacy. Presently, courses in technological literacy have been implemented in every school in Kuwait (Al-Kbaz, 1992).

Many studies such as Al-Kbaz's (1992) and Almahboub's (2000) were conducted in Kuwait about attitudes toward computer use as technology tools. These researchers recommended that further research be conducted to explore this issue, identify the use of technology inside and outside schools, and develop an awareness of positive values for education. This study will focus on the use of toward technology use inside and outside schools among Kuwaiti students at the intermediate education level. The objective of this study is to determine technological use in and out of schools among Kuwaiti students at the intermediate education level.

The Study's Significance

There is need to conduct this study for the following reason: this study will attempt to understand middle schools students' perceptions of technology use inside and outside schools, particularly students' impressions of educational technology. Several studies about technology perceptions have focused on high school and college students. However, there have been few studies of middle schools students and the use of technology inside and outside school; particularly in Kuwait middle school, students are probably using technology differently from students in higher grades, so their perceptions may be different. Studies in Kuwait have attempted to identify the impact of technology use inside and outside schools regarding variables such as age, gender, and grade levels, so there is a need for additional research.

CHAPTER II

LITERATURE REVIEW

This chapter will review the relevant selected literature relating to the study. The addressed literature areas involve:

- ✓ Education background on use of technology use;
- ✓ How information and communication technology (ICT) impacts learners;
- ✓ Education and mobile technology;
- ✓ iPad in education technology;
- ✓ Computer technology education;
- ✓ Benefits of technology inside schools;
- ✓ Benefits of technology outside schools;
- ✓ Information technology in Kuwait education;
- ✓ Gender differences and technology;
- ✓ Grade levels and technology;
- ✓ Theoretical framework; ✓ The purpose of study; and
- ✓ Research questions.

Background of Educational Use of Technology

Modern technology has altered many aspects of American life, including but not limited to recreational, commercial, and educational. Scott, Cole, and Engel (1992) noted that *A Nation at Risk* was the motivating factor for the implementation of the computer and advanced technology into the classroom. While that book criticized the American educational system, one of the positive recommendations was that schools should have technological use included in their curriculum. In response to new technological development devices, both the public and educators revised the skills students must be taught to allow them to successfully compete in the business world. Computer-assisted instruction is thought by some to be one of the greatest innovations in education. Eisenberg (1996) noted the advent of integrating Computer-Assisted Instruction (CAI) into the content areas as an important trend. Educators determined that separate computer sessions did not help students develop the skills to apply technology meaningfully.

On October 10, 1996, Tennessee became one of the first states to take advantage of the advances in modern technology when all of the state's 1,560 public schools were connected to the Internet. An ambitious project, ConnecTEN, was the result of cooperation between businesses and the state and provided even remote communities access to the libraries, museums, and databases of the world (Derks, 1996). The Tennessee Education Association in a 2001 IPD Tech Tips stated that technology, in and of itself, is nothing but equipment and cable. This association further stated that when technology is integrated in the curriculum, it means using technology to teach and not teaching about it. Dence (1980) maintained that (CAI) came into existence when educators learned to combine the features of Skinner's programmed instruction with Skinner and Pressey's teaching machines. Ely (1995) dated the roots of educational technology as a twentieth-century development during and following World War II. Ely noted that what started on emphasizing communication through audio-visual media slowly got focused on the learning and teaching systematic development procedures that were based on psychological behavior. At present, the fields that contribute significantly to CAI include social psychology, cognitive psychology, perception psychology, management and psychometrics.

Hamilton (1995) noted that computer-assisted instruction was originally limited to drill and practice, most often in the format of a concept initially presented in the classroom followed by a trip to the computer lab where students were provided with a series of similar problems to solve. Utilizing this format, computer assignments merely reinforced concepts with the student progressing to more difficult problem situations only when a predetermined degree of mastery had been achieved. Simonson and Thompson (1994) noted that that 75% of all educational programs as late as 1984 were limited to the drill-and-practice formula. According to Hamilton (1995), the second stage of CAI was developed in response to educators' dissatisfaction with the use of expensive equipment for such a limited means. This led to the development of tutorials designed to expose students to new concepts and skills. Students' responses determined the presentation of material and the speed at which new information was presented. Both drill and practice and tutorials provided the instructor with records of students' progress. The two methods of CAI have been replaced with simulations and hypermedia. These methods allow students to alter variables in a presentation, which produced a variety of results. Hamilton (1995) termed this type of instruction "discovery learning," in which students analyze problems, evaluate data, and alter responses.

In summary, scholarly research studies have proven that what started on emphasizing communication through audio-visual media slowly got focused on the learning and teaching systematic development procedures, such as computer-assisted instruction, used in the previous study, has originally limited to drill and practice, most often in the format of a concept initially presented in the classroom followed by a trip to the computer lab where students were provided with a series of similar problems to solve.

Influence of Information and Communication Technology (ICT), through the Use of Computers

ICT in educational institutions around the world is commonplace. Societal embrace of ICT has been evident of its acceptance and effectiveness over the past fifteen years. According to the EDUCAUSE Center for Applied Research survey reports over the past few years, it was attested that ICT use and adoption in academic environments has increased. ICT has been increasingly used in academic settings, affecting students' experience and achievement (Sandier, 2010).

Numerous research studies have acknowledged significant increases in students' achievement measures across various disciplines and grade levels, in addition to their custom made test scores, grades at the end of the course, and the accumulative grade point averages (GPAs).

In their one-year study, Royer and Royer (2004) made a comparison in using pencil, paper and computer tools in the creation of concept and mind maps in two combined biology classes of the ninth- and tenth grade where the same teacher taught them. The findings revealed very significant differences in complexity and quality where it was enhanced when using computer, in creating the mind maps/concepts. According to Novae and Canas (2008) meaningful learning only happens when the student has supporting tools for developing maps that are more complex. Those students who were able to create mind maps or concepts could gain a better understanding of the concept, find relationships, recall more things, have their thoughts organized and attain notably high scores. Students contended that if they had to make another mind map or concept they would chose to use the software of mapping concept instead of using the pencil and paper.

Additionally, students indicated the teacher's support facilitating the learning process. Teachers realized that the strategy greatly assisted students to gain a better understanding of concepts and among the two groups, differences were noted. Students were more motivated to develop concept/mind maps, spent more time on tasks, were more engaged, and were more focused on their own learning rather than completing assignments. Mackinnon (2006) carried out a study at Acadia University in the Education school which happened to the first learning institution in Canada to use laptops, to investigate the issue of building critical thinking patterns through the use of a 2D graphic organizer that was hyperlinked and concept mapping software in a science education classroom.

Mackinnon reported that students were significantly positive about using Inspiration software. It provided a framework for understanding science education. Students discovered that the Inspiration software was moderately comfortable to use and noted that the software drawing features were quite simple to learn, apply, as well its usefulness for its hyperlink features. They also noted that ICT productivity tools, including concept mapping application software such as Inspiration, allowed them to articulate their understanding. They felt the effective and efficient demonstration of such tools would help them in planning with technology. Students also believed that Inspiration would be very crucial in the generation and delivery of the curriculum as it was easily mapped. The students' perceptions and attitudes with regard to usage of Inspiration Software were investigated in the study of Boon, Fore, and Rasheed (2007). A format of guided notes was used as a strategy for instruction in order to increase students' content learning area in history classes. In one of the classes, technologically-based instructions were given where Inspiration software was used while a format of guided notes was used in the other class. The study revealed that students responded significantly better toward using computers and Inspiration software than the ones who used the format of guided notes. The students reported that the software was very simple in incorporating it to instructions and at the same time user friendly. Moreover, students were assisted in learning more of the content in the history of the world. Researchers also indicated that the software would be beneficial in increasing the area content learning in the curriculum of classes such as chemistry, art, biology, mathematics, foreign language and also English as a Second Language (ESL). According to Boon, Fore & Spencer, (2007), a satisfaction survey study on teacher's perceptions and attitudes was carried out to find out the effectiveness of instructions that are technologically based through the use of Inspiration software as a strategy in classes of social studies. The results revealed that teachers were positive in using the software and affirmed that this application had the potential of:

- ✓ Improving the learner's test scores and learning capability before and after testing
- ✓ Providing crucial skills while studying (teachers said that through the software, students are given an outline format for note taking and using as a guide to study.)
- ✓ Increasing students' engagement
- ✓ Time spent on the task is improved
- ✓ A student's motivation in instructions of social study is increased.

Generally, teachers found the graphic organizers and especially the software to be helpful to students. Cunningham and Stewart (2002) carried out case study research on students enrolled in the undergraduate courses of education psychology. For them to show an understanding of causal relationships in the class systems and learning theory, students were taught how to use Inspiration software. Results indicated that a few students recorded low performances while most of them scored highly on the analytical causal diagramming influence as well as case analysis. Additionally, for many students in this study, high accuracy on items of multiple choices was very common. It was evident that undergraduate students experienced no difficulty in software manipulation. Findings revealed that most students believed that the causal effect diagramming had a positive performance effect and their experiences proved to be helpful in studying complicated systems of education.

In summary, scholarly research studies have proven that concept mapping and visual learning software, such as Inspiration application, used in the previous study, has the ability to enhance teaching and learning outcomes. Similar applications have the potential of building a strong foundation in promoting a significant lifelong learning for students of all ages and across all disciplines.

Mobile Technology and Education

Mobile technology and education as well as the coming together of technology and learning cannot be a replacement of formal education. Instead, it offers a way of extending the support of learning without the classroom to the daily life of interactions and conversations (Sharples, Taylor & Vavuola 2007). This summarizes the mobile learning idea that is being explored by this paper by using an iPad. In order to illustrate convergence, Sharpies et al. made a comparison of the 'new learning' features to those of 'new technology'. New technology supports individual learning since it is personal. On the other hand, mobile technology is portable, networked and enables omnipresent learners to collaborate. McFarlane, Roche and Triggs (2007) studied how mobile devices are applied in schools for learning and teaching. They saw shifts in the manner that teachers use to teach and how students learn. According to the author's observations, teachers like creating learning environments that are democratic and also provide independent and modified learning for their students. Those learners who used mobile learning devices appear to be having higher motivation levels and participated in many activities that were learner directed outside school which had relations to the schools' curriculum.

With regard to mobile learning, Laurillard (2007) developed a conversational framework that offered a means of analyzing how methods of teaching and technological tool attribute to the process of learning. Through the framework, Laurillard hypothesized that in comparison to traditional learning activity, more opportunities would be built for activities that were digitally facilitated and for control and ownership over what learners can do. Low (2007) in support of the mobile learning alleged that mobile devices usually encourage and support scholastically sound learning and teaching practices like sharing, knowledge building, and collaboration and that the mobile interaction encourages the learning allied to the principles of constructive social schoolings. The rising importance of mobile literacy was also highlighted by Low as he noted that digitally mobile devices are now the standard industrial equipment for most professions and industries. Although Murphy and Williams (2011) referred to touch pads as "Post-PC" devices. The newer technology deals with small technological computing devices like the portable digital assistants (PDAs).

The newest computing capabilities include a camera, mobile phone and various add-on hardware extensions. This convergence was referred to as the latest technological revolution by Csete, Wong, and Vogel (2004). On the other hand, Attewell (2005) suggested that as the devices increased in number across the globe, the mobile technology will define most people's digital life. The main limitations of smart phones and PDAs can be overcome by the iPad touch devices which have been deemed as smaller screen areas in the education literature and with interactivity that is restricted (Churchill, Fox, & King, 2012).

The literature has suggested that students may be assisted in many ways by PDAs to learn (Attewell, 2005). Moreover, the mobile technology receives positive students' feedback on regular basis. Nonetheless, even though students may feel inspired at the time of using such technology, the results in their learning might be unsatisfactory (Chu, Hwang, Tsai, & Tseng 2010). According to Brand and Kinash (2010), even if most existing studies explore the acceptance and perception of the mobile technology, its learning impact has been narrowly researched. They made assertions that the perceptions of students together with their creative and critical thinking may over time increase due to mobile learning engagement. The mobile technology is likely to support reflections among students and apparently lead to improved achievement owing to the suitable match between the teaching styles of teachers and learners' styles of learning. According to the authors, research on the use of mobile technology by teachers needs to provide ideas relating to the affordance of this kind of technology in attaining various outcomes in learning. iPads are capable of becoming a technology that can create environments of flexibility, collaboration and inquiry. Nonetheless, it is important to develop suitable models for their use.

iPad in Education Technology

Even though there has been useful ideas regarding the affordance of the PDA technology in education, there is a rising need for a framework that is more applicable in offering policy makers, researchers and teachers with an improved presentation of the affordability of emerging technological touchpads. The present day studies that involve iPads in education offer valuable and limited suggestions. For instance, in Australia, the Parramatta Catholic Education Diocese carried out experiments using iPads in 8 primary schools and 3 secondary schools and established that iPads were quite effective as:

- ✓ Learning support in various settings due to task suitability and portability
- ✓ Student engagement support and quick accessibility to apps required by students for a certain learning task
- ✓ All level students may use apps particularly for rote learning and reinforcement of fundamental concepts

The 'Step Forward' of flier implementation of iPads at the University of Melbourne, Trinity College proposes that this type of technology supports various styles of learning and enables students to achieve their goals quickly (Jennings, Anderson, Dorset, & Mitchell, 2011). Moreover, it is held that compared to other equipment of technological computing like laptops, iPads are more effective. The use of this technology led to minimal use of paper and printing. A survey of teacher and student experiences in this institution showed that iPads were recommended for use by overwhelming numbers (80 % of the students and 76.2% staff). According to Jennings et al. (2011) the benefits derived from use of iPads entail educational value and flexibility, minimal cost, weight, size, battery life, need for low maintenance and also user friendly to touch screen. Murphy and Williams (2011) made suggestions that for class material presentation, iPads are technologically effective through systems of multimedia. Churchill et al. (2012) also stated that the iPad's main advantage is that it can be used as a database for multimedia. Other benefits entail the interaction ease through the touch screen, size of screen, sound volume, controlled playback multimedia, and capabilities of data collection.

At the University of San Francisco and under the supervision of the university's Center for Instruction and Technology, 40 teachers from various faculties used iPads over a period of six months (Bansavich, 2011). It was established that after its implementation, some of the iPad's main advantages in institutions of higher learning entail the e-reader, capabilities of electronic textbooks, annotations, interactivity, multimedia viewing, ease of use, Apps' accessibility, and the device's speed. Bansavich carried out further research and cited that iPads were ideal in clinical settings, language learning, and sciences (particularly because of apps). Moreover, iPad added extra advantage in student content advising, field work, lab setting, researching, and tutorial views. Another pilot implementation of iPads confirmed that this technology enhances greater communication between the teachers, and students (Beebe, 2011). Beebe claimed that the students who took part appeared to be very motivated in attending classes and submitting their assignments and those students became more responsible in their learning as a result of using iPads. Moreover, through the use of e-books, students made considerable savings as opposed to making purchases from the bookshops.

Even though iPads incorporate most functions that a laptop and PDA device have, it is basically a new platform for computing in classrooms (Walters, 2011). According to Walters, the main advantage of the iPad is that it is not just a consumption tool, it is also very crucial for idea and content creation. Particularly for teachers, Walter attested that iPads may be used as a book in their scholarly libraries and also as a tool which enables easy technological experimentation.

Furthermore, teachers may collect assignments easily. According to Walters, portability and support through kinesthetic interaction helps students in developing spatial and visual skills and hence attain the peak of Bloom's Taxonomy level.

In summary, scholarly research studies have proven that this type of technology supports various styles of learning and enables students to achieve their goals quickly, such as iPad, used in the previous study, has extra advantage in student content advising, field work, lab setting, researching, and tutorial views. Another pilot implementation of iPads confirmed that this technology enhances greater communication between the teachers, and students.

Technological Benefits Inside Schools

The benefits of implementing technology in the classroom are numerous and may be applied to any aspect of the curriculum. Fewer references have been made to applications of technology such as physical education curriculum, especially at the elementary level. An attempt to ascertain the effectiveness at this level of the curriculum was the motivation for this research project. Sanders and Birkin (1980) and Guthrie (1991) noted that CAI's ability to provide individualized learning is the main advantage over traditional instructional methods. By means of software that employs animation and hypertext in simulations that respond to students, the educational climate is closer to the ideal situation of one teacher per student. Sanders and Birkin maintained that students received more positive reinforcement from CAI than from an overworked instructor. Schroeder (1991) cited Allred and Locatis (1988) as noting that there are many benefits offered by hypermedia to the learner and particularly through its ability of adapt to personal differences and enabling learners to control their study path.

The learner may either wonder or get directed through information. Customized interfaces can be provided by the system to every user through various levels of guidance. According to Peck and Dorricot (1994) the students' abilities could be fostered in revolutionizing the manner of working, thinking and accessing the world. The authors listed the following advantages for the educator: the ability to individualize instruction, the ability to create simulations to permit students to master new concepts, and the ability to stimulate the creativity of students. However, Haugland and Wright (1997) maintained that both the experience with which the student is provided as well as the appropriateness of the software determines the successful incorporation CAI in the curriculum. Campbell, Campbell, and Dickinson (1996), when discussing the values and implications of CAI stated that students who are visually oriented are enabled by computers to learn through their own strength even as they interact technologically.

In order to see and manipulate the material they can access or create in various forms, student can take advantage of the opportunities before making final copies of a project that is written. Wells and Kick (1996) contended that, to fully benefit from multimedia technology, all capabilities of technology must be utilized including components such as graphics and images of high quality, transitional effects, sound and music, virtual reality and 3-D animation modeling.

Gulek and Demirtas (2005) found that students who made use of computers to learn how to write were very motivated and engaged in their writing. Moreover, they also provided work of high quality and greater length particularly at the level of secondary school. Writing improvement when using technology was particularly evident in poor performers and the special needs students. When doing the school work, these types of students depicted greater improvement than high achievers and average students on a word processor as opposed to the conventional methods of instruction (Dalton & Hannafin, 1987).

Butefish (1999) enumerated four components that are effective in utilizing technology in a pedagogical environment:

- ✓ Labeling the learning or inform the students regarding what will be learned, not the activities involved
- ✓ Involving students by ensuring that all actively participate
- ✓ Relating to previous learning by reminding the students of material previously studied or activities completed
- ✓ Establishing a need for the learning by relating new content matter to the students' lives in and out of school

Not all situations require all four components of set; however, Butefish strongly recommended each lesson contain set as an introduction to the material. Instruction, Butefish noted, may be divided into three components: teaching, monitoring and adjusting, and supervised practice. Butefish described the first of the components, teaching or instructing, as interactive teaching. Interactive teaching is the process where teachers and students communicate about the successful completion of a learning task. The emphasis in this description should be on communication. Butefish described three problems in the implementation of interactive teaching: no teaching, all teaching, modeling the learning without labeling. No teaching at the elementary level may result from the use of printed exercises presented to students with poor or incomplete instructions and, at the secondary level, class assignments with limited monitoring. All teaching may be defined as a lecture-type situation with no provisions made for students to clarify content and no method for determining student comprehension during the class session.

Modeling learning without labeling was the phrase used by Butefish to describe an instructor's presentation of material without informing students what to look for or what to expect during the instruction period. Butefish stated, "Modeling without labeling is characterized by the teacher who demonstrates a skill (a physical skill, a problem- solving skill, etc.) in its entirety without breaking the skill into steps, labeling (identifying) the steps, and explaining what to look for or how to check for accuracy at that point in the exercise" (p. 3). Closure, noted Butefish, is the means by which the lesson is brought to a logical conclusion. Butefish explained that the Tennessee Instructional Model calls for closure to be done by student not directed only by the teacher." It is an opportunity for students to complete one more example or to restate what has been learned. The emphasis here is on content, not activity.

In summary, scholarly research studies have proven that the learner may either wonder or get directed through information. Customized interfaces can be provided by the system to every user through various levels of guidance. In addition, the emphasis in this description should be on communication.

Benefits of Technology Outside Schools

The use of computers by young people in homes has revealed various characteristics from previous studies including:

- ✓ Home use of computers is embedded in the interests and hobbies of existing young people
- ✓ Through the use of computers, young people committed substantial time periods to certain projects (either small activities that can last a couple of hours or sustained expertise development in a certain area over some period of years).
- ✓ In most cases, young people got support through wide availability of material and human resources that offered just in time help whenever required
- ✓ Young people in most cases acted as teachers and experts within the family's culture (Sutherland, Facer, Furlong, & Furlong, 2003)

In the course of this study, there were still features identified as crucial for shaping the computer usage among the young people. When it comes to matters of computer usage in homes, young people went on to deem this as part of a wider setting in terms of interests and hobbies.

For example, a thirteen-year-old young man who participated in a band while playing the guitar made use of the internet in order to locate those websites where music tracks that are newly released are kept. He regularly made revisits in the internet to look for better tracks or improved versions of his desired tracks (Facer, 2004). In 2003, it is the environment at home that continued to shape the home use of computers among young people through their interests and the time at their disposal used in exploring in an unrestricted manner at home. Nonetheless, home usage of computers has been seen as an activity that is connected and not just in terms of information accessibility but instead as a loaded instant system of communication where young people are connected with their friends outside of school.

Facer (2004) and Saba (2009) argued that technology outside schools has been used for improving the quality of a learner's work. Research suggest that technology is potentially capable of improving quantitative performance assessments in fundamental subjects and the overall GPA. Nonetheless, there is also increasing evidence that beside quantitative benefits, technology also has qualitative improvements which can affect the quality of a student's work.

In addition, technology helps to improve learning attitudes. Students at risk are not only those who positively respond to the tech-savvy use. Many research studies depict that most of the students are likely to adopt e-learning which creates a sound atmosphere and, at the same time, gives greater confidence to students. In the tutor cognitive studies, students were very likely to admit that mathematics was beneficial outside the context of academics and to this they became more confident in mathematics than other students in traditional classrooms (Morgan & Ritter, 2002).

Although many studies have found student attitudes toward learning improved using technology outside schools, some studies have not seen a major difference in the motivation or attitudes of students (Funkhouser, 2003 & Winter, 2002). Nevertheless, most of the research tends to support the improved attitude correlation through technological use outside schools (Saba, 2009). In conclusion, the adoption of technology inside and outside schools is considered, in general, to be very important. Many research studies depict that most of the students are likely to adopt e-learning which creates a sound atmosphere and, at the same time, gives greater confidence to students. The next section is more specific and focuses on the use of technology inside and outside schools in Kuwait.

Information Technology in Kuwait Education

In September 1994, ministry of education in Kuwait (MEK) launched the Kuwait Intermediate School Information Technology Project. (KISITP). The project was to be implemented and disseminated fully in all of Kuwait's intermediate schools from 1994 to 2003. The main objective of KISITP is the introduction of information technology (IT) to the intermediate schools in Kuwait between grades five to eight. Most categories of computer technology are addressed by the IT curriculum and include CAI, Logo Programming and computer managed instruction. Additionally, the IT curriculum is normally integrated to other subject areas by the students in the projects who show up at the end of every unit.

The goals and philosophy of KISITP are to:

- ✓ Empower all students to fulfill their potential through initiation of computers skills at a young age.
- ✓ Get students ready to fulfill the demands of a society that changes rapidly and which prevents modern technology alienation.
- ✓ Enforcing active learning by use of computers and other high-tech equipment and developing Higher Order Thinking Skills (HOTS) like decision making, reasoning and problem solving.

- ✓ Learning experiences are integrated by linking other subjects with IT skills within the curriculum
- ✓ Encouraging students to adopt positive attitudes amongst themselves with respect to education that is computer oriented.
- ✓ Encourage learning through group work cooperation in terms of gathering, information management, and analyzing.

When the intermediate stage comes to an end, students are expected to:

- ✓ Use the computer as a tool for general purposes for supporting learning through the use of word processing, graphics, database, telecommunication and other application packages in general.
- ✓ Appreciate the use of computers as a tool for solving problems
- ✓ Use of spreadsheet or Logo programming in developing analytical skills
- ✓ Using the technology of word processing and integration of other suitable computer technology applications like graphics in supporting work in various areas and projects that are self- created.
- ✓ Use of CAI enhancing learning through practice and drill, tutorials and simulation
- ✓ The use of multi- media presentation in various activities
- ✓ Use of computer innovations like emails and use of the internet culture

Abou Zaid, Al-Ahmad & Al-Rshad (1997) in the *Teacher Book of the Information Technology* curriculum gave an outline of what students are expected to learn after one year's enrollment in KISITP. This includes: In unit one, fifth and sixth grade curriculum concentrates on the world unit of computer and computer literacy where students are expected to learn how computers should be turned on and off, how a mouse and keyboard should be used , the icons needed in executing orders and how applications should be opened and used. Students in the Lets

Draw unit learn about using graphic applications, drawing and designing various cards and shapes in different occasions before coloring them. Students get to learn how written text should be added to what they have drawn and save this file to be used later in printing or editing

Another great application is the "Lets Write" word processing unit where students get to learn how this curriculum should be used. Students are able to type, make corrections, saving, editing and printing whatever they have written. Students can organize their essays and move their sentences, words and paragraphs. They also learn thinking development skills and problem solving skills which relate to the process of writing. In the units, what students have learned is linked to other subject areas that can be beneficial through computers.

In the "Let's think with Logo" unit, students get to learn about solving problems, thinking and skills creation through the use of Logo language. More than US$24.1 million have been spent on this project (Al Fraih et al., 1997). The huge money amount is an investment that students are able to benefit from through the innovation. Since it is just the beginning of the computer education program for students in their intermediate stage, there is need for studies to investigate how the use of computers influences Kuwait student’s attitudes. The makers of policies in the education ministry are looking for evidence of the investment's results regarding information technology. They look for many answers to such questions like how the adoption of computers has changed students’ attitudes and how their achievements have been influenced by the information technology curriculum.

To summarize, in the past few paragraphs I have outlined the Kuwait Intermediate School Information Technology Project (KISITP). The project was to be implemented and disseminated fully in all Kuwait's intermediate schools from 1994 to 2003. Also, the main objective of

KISITP is the introduction of information technology (IT) to the intermediate schools in Kuwaiti between grades five to eight, and now we are going to know how socially acceptable is the internet and technology access in Kuwait.

Internet and Technology Access in Kuwait is Socially Acceptable

In Kuwait, which was the first Arab nation to give access to the Internet in 1994 (Jradi, 2003), the boundless utilization of the Internet has influenced every single instructive foundation, organization, and different associations. The Internet has turned into an instructive apparatus in schools, universities, and colleges in Kuwait, where students use it as a correspondence and exploration device. The Internet's presentation in the classroom in all the instructive establishments in Kuwait, and the data education courses that are offered to students, gives male and female students an equivalent chance to figure out how to lead the utilization of this innovation in an expert way. With the capacity and boundless utilization of the Internet comes the likelihood of dependence on this innovation among both male and female students.

All things considered, more studies should be done, on a national level, keeping in mind the end goal to give more practical and test examination proofs that uncover how productively and successfully ICT apparatuses can be utilized and incorporated all through education. These types of examination studies should have to concentrate significantly on academic patterns and issues identified with ICT, not just on ICT obtaining patterns and issues (AlKhezzi, 2011). There is an absence of studies completed with respect to the utilization of innovation in instruction particularly in schools in the Arab Gulf Cooperation Countries (GCC) and the Middle East (Farag, 2005). As per Ali (2004), research on IT adoption in the Middle East is highly restricted. The absence of utilization of innovation has influenced the measure of exploration examinations completed inside of this field. In this manner, there is a need to comprehend the explanation for the absence of utilization of PC innovations in these schools and in like manner in this society.

The writing proposes that the moderate IT dispersion in developing countries like those in the Middle East could be credited to poor base, high costs, language obstructions, social variables, and legislative issues contributing hindrances to the process. Authors like Shaw (2002) contend that it turns into an inquiry whether the state of preparation of local people, the desires of folks and the accessibility of equipment and the fundamental social suspicions truly offer ideal conditions for reception. Subsequently the society's comprehension connection, in which the combination of innovation occurs, needs to be thought about.

When tablets were introduced as a learning tool for secondary schools the Alanba Kuwaiti newspaper reported on November 4, 2015, describing that this is a big jump towards e-learning: Dr.Bader Al essa said the following to Alanba newspaper:

> The use of technology has become a necessity of life, importance of using it, in addition, there is no longer a field of fields of knowledge, but the computer plays the biggest role in it, pointing out that the use of computers in education has increased day after day, but take many forms, where now depends on technology to provide educational content to the learner a good and effective manner. He stressed that the introduction of digital technology in the educational process plan is not born of the moment it is a dream haunted decision officials in the Ministry of Education several years ago as part of their efforts to improve the elements of education of students and the teaching and in the framework of the development of teaching methods in public schools and transform student recipient of an item to the participant actor in educational process. This will answer the question, why is Kuwait situation worth studying**?**

Digital Divide

One common concern with the introduction of technology is who has access, and is this access equitable. In the absences of equal access a digital divide may be created. A digital divide is an economic and social inequality with regard to access to, use of, or impact of information and communication technologies (NTIA, 1995).The divide within countries (such as the digital divide in the United States) may refer to inequalities between individuals, households, businesses, or geographic areas, usually at different socioeconomic levels or other demographic categories. The divide between differing countries or regions of the world is referred to as the global digital divide (Norris, 2001 & NTIA, 1995). It is important to examine this technological gap between developing and developed countries on an international scale (Chinn & Rober, 2004).

Multiple studies (eg. Abdalhameid, 2002; Fraina, 1991; Okebukola & Woda, 1993) have indicated that the digital divide still exists in many countries, especially regarding use by men and women. However, the U.S. Department of Commerce (2002) indicated that in some developed countries, such as the United States, the digital divide has or is disappearing. Further, some studies (Cramer, 2007; Ringstaff & Kelley, 2002; Terenzini, Theophildes, & Lorang, 1984; Waxman, Lin, & Michko, 2003) have indicated that the digital divide can have an impact on learning outcomes. Although Kuwait is a developed country, little research has been done in Kuwait in order to determine whether the Digital Divide still exists and whether or not any digital divide that might exist has an impact on learning outcomes.

Gender Differences and Technology

To begin with, since computer usage at work contributes hugely to the rate of usage of computers, the gender differences in participation of labor force contributes to differences in computer usage in general. Put another way, those who do not work do not have the chance of using a computer that may be factored in the entire computer usage statistics. Since it is men who are more likely to work than women, women's overall IT rate usage may be lower than their men's counterparts. As such, an investigation is needed into the status of employment in terms of IT usage such as what is the extent of individual usage to computers or internet anywhere.

There have been inconsistent findings after studying gender computing issues with children as young as three years. Many of the studies found differences in gender in the behavior and attitudes of preschool children. Compared to the girls, boys displayed a preference of action oriented software (Brinkley, Bordeaux, Calvert, & Watson, 1989). Researchers have found out that preschool boys took more time with computers than the girls, hence with time, computer usage increased (Bernhard, 1992; Currell, 1990). Fletcher-Flinn and Suddendorf (1996), in a New Zealand study, found that boys aged between three and four considered computers to be meant for boys while girls believed that they were for both girls and boys. In another study, it was established that girls viewed computers as feminine while boys deemed them as masculine (Ogletree & Williams, 1992). In another study, it was established that there was no stereotyping of gender among the preschoolers (Beeson & Williams, 1985).

Many studies have shown that there are various biological and social differences which have characterized both women and men. The gender difference role in the use of technology for learning has been researched (Kahveci, 2010). From past studies, authors have seen that technological use in learning is an activity that is dominant for male students because males have a more positive attitude in the use of technology for learning than females (Kadijevich, 2000; & Kirkup, 2007).

Additionally, when equal opportunities are offered to every student, the likelihood of using computers by females is less than males because females regard technological use in learning to be a male dominated activity (Kirkup & Li, 2007; Fisher, Hwang, Suk &

Vrongistinos, 2009). Due to influences from society, gender stereotypes also affect students. Female students are usually not attracted to computers as male students since computer courses are activities that are traditionally male dominated hence the females have little interest in applying this technology when learning (Li & Kirkup,2007). Although females may be having interest in technological learning, many female students have little confidence compared to the males (Colley & Comber, 1997).

In a different study, female students indicated that computers were very useful even though they found the computer lessons to be less fun than male students (Kaino, 2008). Several other studies found out that females were less confident to use technology and had a lot of interest in learning about it (Cuban & Kirkpatrick, 1998; Emran, Shahrizal, & Dhindsa, 2011). Moreover, women experienced more difficulty in internet searches compared to men (Georgia GVU Center, 1998). Kirkup and Li (2007) made a comparison of Western and Chinese students regarding differences in gender on the use of technology in learning. They found out that both British and Chinese male students depicted more confidence compared to female students regarding their computer skills and they settled on the fact that the activities of computer use are male dominated. Therefore, this situation is applicable to both Asian and Western cultures.

A study by Papastergioua and Solomonidoub (2005) investigated differences in gender in internet usage by pupils of Greek high school in and out of the school environment. They took a sample of 340 pupils aged 12 years old, half of them boys and half of them girls, and results of the study indicated that females lost interest in using technology in terms of frequency, attainability, location and internet access purposes. Analysis from the data revealed that many students used internet outside school in places like their homes and internet cafes. Boys also have greater opportunities to access the internet. In and out of school, the favorite students' internet activities entailed gathering information for purposes of entertainment and personal use.

Compared to girls, boys made use of the internet for purposes of web creation and entertainment and no other major gender differences were noted concerning the students use of internet like email communication, video conferencing, chat, searching for information for school or personal usage and also surfing the web.

To sum up, there are gender differences between boys and girls towards technology and their involvement in the use of technology, across many cultures. Another individual differences variable grade level differences towards technology. The next section examines this factor.

Grade Levels and Technology

The introduction of educational technology began in 1986 at the first- and second-grade level. By the fifth or sixth grade, a writing instructor at the school noted that students were producing researched, five-page term papers with more professional results than would have been possible with older research methods. Students were better prepared for middle and junior high grades and possessed skills to utilize technology.

In *Differentiated Instruction Using Technology* (2005), Amy Benjamin highlights six features of technology, beyond motivation, that support differentiated instruction:

"1. Privacy: Technology affords the privacy that is required in order to support the self-esteem of students who are working on a task that is considered by the rest of the class as “too easy.” 2. Collaboration and communication skills: Online technologies, such as email and discussion boards, encourage communication and collaboration among students, which are essential elements in forming and maintaining learning communities. 3. Organization: A number software helps students organize their work (i.e., create graphs and outlines) based on their interests and needs. These organizational functions of the software make it easier for teachers to implement differentiated instruction without having to do the organizational work and the individual advising that would have been necessary when implementing activities during whole class instruction. 4. Learning styles and sensory learning: With the availability of words, images, sounds, and feedback by others, technology encourages visual, auditory, and social learning, and therefore encourages students of different abilities and interests to participate in the learning process. 5. Choices: Internet and software technologies offer students a wide range of activities that can address the wide range of skills and interests found in classrooms. 6. Authentic learning: The project-based activities that are usually found in good quality software and Internet sites support authentic learning and constructivist instruction, which are important aspects of differentiated instruction" (p. 13).

Theoretical Framework

This study examined measurement indicators and their reflection on the use of handheld electronic technology inside schools among Kuwaiti students at the intermediate education level. Educational technology theory will guide for this study and provide the theoretical framework. The effective technological tools when learning is the use of the education technology. The concept relates to various tools like the iPad, mobile, media, computers and the consideration of theoretical perspectives in effective application (Anderson & Garrison, 2003; Richey, 2008).

Electronic educational technology is now a crucial part of today's society. Richey (2008) described the education technology as the ethical practice and study in the facilitation of learning and performance improvement through the creation, usage and managing of suitable technological resources and processes.

Instructional technology included elements such as design theory and practice, utilization, management, development, process evaluation and learning resources.

Association for Educational Communications and Technology (AECT). Therefore, all the valid applied and reliable educational science like equipment, procedures and processes which are a consequent of scientific research and to a certain context referred to as algorithmic, theoretical or heuristic processes (Anderson & Garrison, 2003; Januszewski & Michael, 2007; Lowenthal & Wilson, 2010).

The contemporary technology in education entails:

- Information and communication technology (ICT)
- E-learning, instructional technology
- EdTech
- Multimedia learning
- Learning technology
- Computer Based Training (CBT)
- Internet based training (IBT)
- Computer management Instruction
- Flexible learning
- Online education
- Personal learning environments
- Web based training (WBT)
- Virtual education
- Networked learning

There are various types of media entailed in the educational technology which deliver audio, text, images, streaming video, animation and also entail technological applications and processes like video tapes or audio, CD-ROM, Satellite TV, computer based learning, local extranet and intranet, and learning through the web. The communication and information systems whether based on local networks, freestanding or based on the networked Internet learning, inspire many processes of e-learning (Leypold, Nölting, & Röser, 2004).

Education technology as well as e-learning may take place inside or outside the classroom. Educators and learners use the education technology in schools and homes.

The Purpose of Study

The purpose of this study was to determine if their differences between how technology is used in and out school by grade level, gender and order.

Research Questions

The results of previous studies have shown indicators and their reflection on the use of handheld electronic technology inside schools among Kuwaiti students at the intermediate education level although there is still need in further determining if these technologies have an impact on Kuwaiti students at the intermediate education level.

There following research questions will guide this study:

1. What are the indicators and students reflection on the use of technology inside schools among Kuwaiti students at the intermediate education level?
2. What are the indicators and students reflection on the use of technology outside schools among Kuwaiti students at the intermediate education level?
3. What are the indicators and students reflection on the use of technology inside schools on Kuwaiti students according to their gender at the intermediate education level?
4. What are the indicators and students reflection on the use of technology outside schools on Kuwaiti students according to their gender at the intermediate education level?
5. What are the indicators and students reflection on the use of technology inside schools on Kuwaiti students according to their grade levels at the intermediate education level?
6. What are the indicators and students reflection on the use of technology outside schools on Kuwaiti students according to their grade levels at the intermediate education level?

CHAPTER III

METHODS

This chapter provides information on the research design, the participants, the instrumentation, the procedures used for gathering and analyzing the data that were collected using the two instruments, and the validity and reliability of the variables.

Research Design

The research design was a cross-sectional survey using a self-report instrument to collect one set of response data from each of the participants. The design was also defined as *ex post facto,* defined as "research to explore the cause for, or consequences of, existing differences in groups of individuals" (Fraenkel & Wallen, 2010, p. G-1). The characteristic feature of this nonexperimental design was that the researcher was not able to manipulate the structure of any of the groups, did not influence any of the responses of the participants, and all of the information obtained reflected historical and not future events.

Participants

The population from which the participants were drawn consisted of Kuwaiti students at the intermediate education level in Kuwait. Two schools were chosen from random locations in Kuwait. The boys' school was more developed and has good access to technology than the girl's school but both schools has the same curriculum and on the same learning system level. All the students were 11 to 14 years of age, at four intermediate education levels: sixth, seventh, eighth, and ninth grade. The total sample size was N = 384 (185 boys, 199 girls).

The samples of students were not drawn randomly from the population, because participation was voluntary. Students who volunteer to participate in a survey may provide different answers than students who do not (Fraenkel & Wallen, 2010). Nevertheless, the sample represented intermediate education level students who used technology frequently in schools for various activities (e.g., word, data, and image processing, sending emails, internet browsing and searching) and they also used technology in their homes to carry out various activities.

Ethical Considerations

Parented consent forms were sent home and returned to the school, student who were approved for participation were met by the researcher. The participants were guaranteed full anonymity with minimal risk, because no information regarding their personal identity was collected. The participants' names were not included, and their responses were not shared. The response data were only used for purposes of research and were kept confidential.

Instrumentation

The instruments were two questionnaires called a survey of technology usage inside school and a survey of technology usage outside school. The 20 items in each instrument were adapted from a previous survey conducted by Facer (2004). The design of the questionnaires was based on an instrumental drawing from a Screen Play project used previously in 1998. Alterations were made to reflect the use of computer categories which emerged during the project's qualitative stages. The four response categories for each item were 1 = Strongly disagree; 2 = Disagree; 3 = Agree; 4 = Strongly agree. The instrument was written originally in English (see Appendix A and B) and another version was made in Arabic by the company Can Translation by translating the original instrument (see Appendix C and D). The averaging of the 20 item scores was statistically justified because the high values of internal consistency reliability for Technology Use Inside School (Cronbach’s alpha = .953) and for Technology Use Outside School (Cronbach’s alpha = .941).

Procedures

The research project was approved by the Institutional Review Board from Middle Tennessee State University. The researcher coordinated his visit with the administrators at the two intermediate level schools before conducting the survey. Before distributing the survey to the students, the researcher introduced himself, and outlined the reasons for the study, ensured the students that their participation was voluntary, and explained how to complete the questions.

The instrument was administered using a counterbalanced survey design, to control for potential order effects. A counterbalanced design was used because the same questions were answered within two different contexts, specifically technology use inside and outside school. Half of the participants (called Group A) completed the questions about technology use in school first, followed immediately by the questions about technology use outside school. The other half of the participants (called Group B) completed the questions the questions about technology use outside school first, followed immediately by the questions about technology use in school.

All the students answered the questions in 10 minutes, after which the researcher and other teachers who worked at the schools collected them. After surveys were collected, the researcher began the data analysis to assess the results.

Data Analysis

Table 1 defines the variables measured using the questionnaire:

Table 1

Definitions of Variables Measured In This Study

Variable	Functional definition	Operational Definition	Measurement level	Values
Gender	Independent variable	Self-reported gender	Nominal	0 = Female 1 = Male
Grade Level	Independent level	Self-reported grade	Ordinal	6, 7, 8, and 9 variable
Technology Use Inside School	Dependent variable	Mean score for 20 items in Technology Use Inside School Survey	Interval	Continuous from 1.00 to 4.00
Technology Use Outside School	Dependent variable	Mean score for 20 items in Technology Use Outside School Survey	Interval	Continuous from 1.00 to 4.00

Statistical Analysis

The statistical analysis of the response data was conducted using IBM SPSS version 20.0 with the protocols described by Field (2011). Frequency distributions were used to summarize the number and percentages of participants of each gender at each grade level. Descriptive statistics (minimum, maximum, mean, median, standard deviation, and skewness) for the 20 items measuring technology use inside school and the 20 items measuring technology use outside school were computed.

The first two research questions regarding technology use by Kuwaiti students at the intermediate education level inside and outside schools were answered using descriptive statistics. The other four research questions, concerning the differences in technology use with respect to gender and grade, were addressed using multivariate analysis of variance (MANOVA) as outlined in Table 2.

The three independent variables were Gender (two levels), Grade Level (four levels), and the Order in which the questionnaires were administered (two levels). The two dependent variables were scores on the Technology Use Inside School and Technology Use Outside School. MANOVA tested the null hypothesis that a linear combination of Technology Use Inside School and Technology Use Outside School would not vary significantly at the conventional .05 level of statistical significance with respect to Gender, Grade Level, and Order.

MANOVA assumed that (a) the sample size was large enough to provide sufficient statistical power to test the null hypothesis without error; (b) the two dependent variables were normally distributed, reliably measured, and correlated; (c) the variances of the dependent variable and the covariance matrix were equal across the groups formed by the independent variables (Grice & Iwasaki, 2007; Hair, Black, Babin, & Anderson, 2010; Huberty & Olejnik, 2006; Tabachnik & Fidell, 2013).

Table 2

Statistical Procedures Used To Answer Research Questions

Statistical Variable	**Independent**	**Dependent Procedure**	**Research Question**	**Variable**
Descriptive Statistics (Mean, Standard Deviation)	What are the indicators and students reflection on the use of technology inside schools among Kuwaiti students at the intermediate education level?		Technology Use Inside School	
	What are the indicators and students use of technology outside schools among Kuwaiti intermediate education level?	Use Outside School students at the	Technology reflection on the	

Table 2 (cont.)

Statistical Procedure	Research Question	Independent Variable	Dependent Variable
MANOVA	What are the indicators and students reflection on the use of technology inside schools on Kuwaiti students according to their gender at the intermediate education level?	Gender	Technology Use Inside School
	What are the indicators and students reflection on the use of technology outside schools on Kuwaiti students according to their gender at the intermediate education level?	Gender	Technology Use Outside School
	What are the indicators and students reflection on the use of technology inside schools on Kuwaiti students according to their grade levels at the intermediate education level?	Grade Level	Technology Use Inside School
	What are the indicators and students on the use technology Use Outside outside schools on Kuwaiti students according to their grade levels at the intermediate education level?	Grade Level	Technology reflection School

Diagnostic tests were conducted using SPSS to determine if the assumptions of MANOVA were violated, including power analysis, Shapiro Wilks normality test, Levene's test for equality of the variance, Box's M test for equality of the covariance matrix, Cronbach's alpha for reliability, and Pearson's correlation between the two dependent variables (Field, 2011). The effect sizes (i.e., the proportions of the variance in the dependent variables explained by the independent variables) were also computed. The interpretation of the effect size was < .04 is negligible; .04 to 25 is low; .25 to 64 is moderate; and > .64 is large (Ferguson, 2009).

A power analysis was conducted using GPower software (Faul, Erdfelder, Lang, & Buchner, 2007) to determine if the sample size (N = 384) was large enough to provide adequate statistical power to conduct MANOVA. The Gpower output is presented in Figure 1

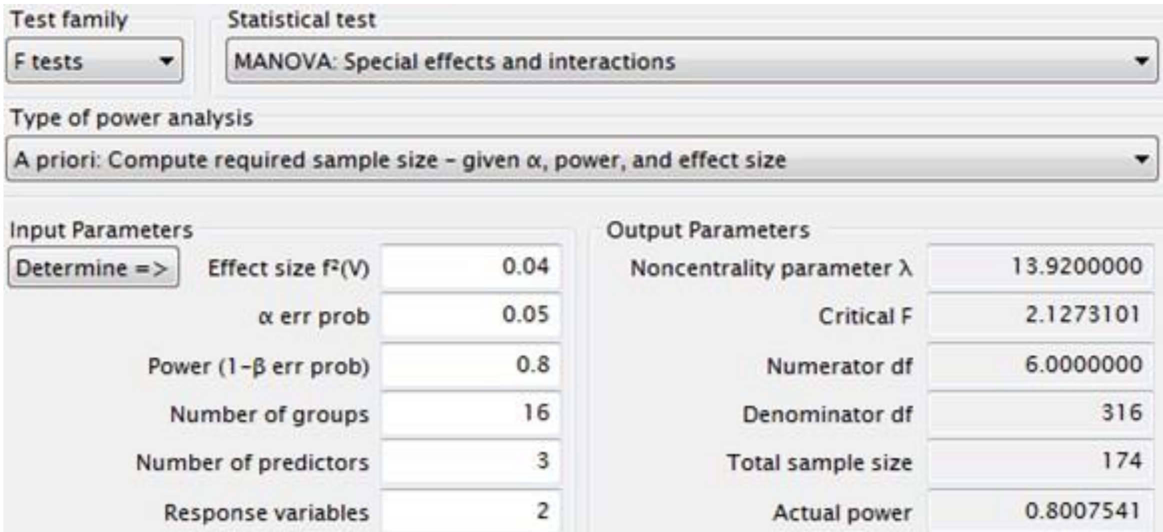

Figure 1. Power analysis for MANOVA

The inputs for the power analysis were a minimal effect size ($f^2 = .04$); a conventional statistical significance level ($\alpha = .05$); an acceptable level of power ($1 – \beta = .8$) ; 16 groups (i.e., 2 genders x 4 grades x 2 orders); 3 predictors (i.e., gender, grade, and order) and 2 response variables (i.e., Technology Use Inside School and Technology Use Outside School). Gpower computed that the total sample size should be at least $N = 174$. The total sample size used in this study ($N = 384$) was more than large enough to provide adequate statistical power to conduct MANOVA. Consequently, a Type II error would not compromise the results of MANOVA. A Type II error means that, because the analysis was underpowered, the effects of gender, grade, and order would be declared to be non-significant, even if they were, in fact, significant.

CHAPTER IV

ANALYSIS OF RESULTS

The results of the statistical analysis are presented in four sections. The first section presents the frequency distributions of the responses to the survey completed by the intermediate level Kuwaiti students. The second section presents the descriptive statistics to determine the measurement indicators and their reflection on the use of electronic technology inside and outside schools. The third section presents the multivariate statistics to determine the effects of grade, gender, and the order in which the survey were administered on the use of electronic technology inside and outside schools. The final section presents a brief summary of the results.

Frequency Distributions

Table 3 presents the frequency distributions of the participants' classified by gender and grade). The total sample size was N = 384.

Table 3

Frequency Distributions of Participants by Gender and Grade (N = 384)

Grade	**Gender**		**Total**
	Male	**Female**	
Six	49 12.8%	50 13.0%	99 25.8%
Seven	49 12.8%	49 12.8%	98 25.5%
Eight	35 9.1%	50 13.0%	85 22.1%
Nine	52 13.5%	50 13.0%	102 26.6%
Total	185 48.2%	199 51.8%	384 100.0%

The sampling design matrix was balanced. There were approximately equal proportions of male (*n* = 184, 48.2%) and female (*n* = 199, 51.8%) students. Furthermore, approximately one quarter were in Grade Six (*n* = 99, 25.8%); one quarter in Grade Seven (*n* = 98, 25.5%); one quarter in Grade Eight (n = 85, 22.1%); and one quarter in Grade Nine (*n* = 102, 26.6%).

Table 4 presents the frequencies of the responses to 20 the items in the Survey of Technology Usage Inside School using the 4-point scores provided by the participants. Missing values are also recorded. The modal score (i.e., the score with the highest frequency of respondents) was consistently 3 or 4, implying that the majority of the students agreed or strongly agreed with all of the items. The most strongly endorsed items, reflected by a score of 4, were “I use the Internet to look up information for school in school” (*n* = 124, 42.3%); “I use the Internet to revise for exams/tests in school (*n* = 137, 35.7%); and “I use educational software (to learn things) in school” (*n* = 134, 34.9%). The items which the students most strongly disagreed with, reflected by a score of 1, were “I shop on the internet in school (*n* = 93, 24.2%); I play computer games against other people on the Web in school (*n* = 91, 23.7%) and “I make websites in school” (*n* = 90, 23.4%).

Table 5 presents the frequencies of the responses to the 20 items in the Survey of Technology Usage Outside School using the 4-point scores provided by the participants. The modal score was consistently 3 or 4, implying that the majority of the students agreed or strongly agreed with all of the items. The most strongly endorsed items, reflected by a score of 4, were “I browse the Web for fun outside school” (*n* = 183, 47.7%); “I use the Internet to look up information for school outside school” (*n* = 163, 42.4%); “I shop on the Internet outside school” (*n* = 161, 41.9%); and “I play games on the computer outside school” (*n* = 156, 40.6%).

Table 4

Frequencies of Responses to 20 Items in Survey of Technology Usage Inside School (N = 384)

Item		**Score**				
		1	**2**	**3**	**4**	**Missing**
1	I write on the computer in school	69 18.0%	51 33.3%	135 35.2%	126 32.8%	3 0.8%
2	I use the Internet to look up information for school in school	43 11.2%	58 15.1%	155 40.4%	124 42.3%	4 1.0%
3	I browse the Web for fun in school	65 16.9%	63 16.4%	119 31.0%	133 34.6%	4 1.0%
4	I fiddle around looking at different things in school	71 18.5%	85 22.1%	107 27.9%	106 27.6%	15 3.9%
5	I send e-mails in school	76 19.8%	99 25.8%	100 26.0%	99 25.8%	10 2.6%
6	I play games on the computer in school	59 15.%	70 18.2%	116 30.2%	122 31.8%	17 4.4%
7	I draw/play with images/photos/pictures in school	67 17.4%	87 22.7%	108 28.1%	111 28.9%	11 2.9%
8	I make or use charts, graphs or tables in school	57 14.8%	75 19.5%	120 31.3%	118 30.7%	14 3.6%
9	I use educational software (to learn things) in school	56 14.6%	56 14.6%	125 32.6%	134 34.9%	13 3.4%
10	I make/design things on the computer	63 16.4%	74 19.3%	134 34.9%	103 26.8%	10 2.6%
11	I use the Internet to revise for exams/tests in school	65 16.9%	68 17.7%	104 27.1%	137 35.7%	10 2.6%
12	I organize the computer files/memory/systems in school	61 15.9%	77 20.1%	119 31.0%	119 31.0%	8 2.1%
13	I watch TV/listen to radio/music on the Web in school	83 21.6%	87 22.7%	90 23.4%	109 28.4%	15 3.9%
14	I download software from the Web in school	75 19.5%	91 23.7%	105 27.3%	100 20.6%	13 3.4%
15	I watch DVDs/videos on the computer in school	76 19.8%	91 23.7%	103 26.8%	103 26.8%	11 2.9%
16	I talk in chat rooms in school	76 19.8%	109 28.4%	77 20.1%	113 29.4%	9 2.3%
17	I play computer games against other people on the Web in school	91 23.7%	78 20.3%	93 24.2%	115 29.9%	7 1.8%
18	I make films/animations in school	72 18.8%	96 25.0%	81 21.1%	122 31.8%	13 3.4%
19	I make websites in school	90 23.4%	99 25.8%	91 23.7%	94 24.5%	10 2.6%
20	I shop on the Internet in school	93 24.2%	100 26.0%	68 17.7%	119 31.0%	4 1.0%

Note: Score 1 = Strongly Disagree, 2 = Disagree, 3 = Agree; 4 = Strongly Agree

Table 5

Frequencies of Responses to 20 Items in Survey of Technology Usage Outside School (N = 384)

Item		Score				
		1	**2**	**3**	**4**	**Missing**
1	I write on the computer outside school	77 20.1%	53 13.8%	105 27.3%	145 37.8%	4 1.0%
2	I use the Internet to look up information for school outside school	44 11.5%	43 11.2%	128 33.3%	163 42.4%	6 1.6%
3	I browse the Web for fun outside school	37 9.6%	41 10.7%	117 30.5%	183 47.7%	6 1.6%
4	I fiddle around looking at different things outside school	71 18.5%	54 14.1%	119 31.0%	113 29.4%	27 7.0%
5	I send e-mails outside school	77 20.1%	61 15.9%	132 34.4%	104 27.1%	10 2.6%
6	I play games on the computer outside school	49 12.8%	46 12.0%	124 32.3%	156 40.6%	9 2.3%
7	I draw/play with images/photos/pictures outside school	65 16.9%	65 16.9%	125 32.6%	111 28.9%	18 4.7%
8	I make or use charts, graphs or tables outside school	93 24.2%	72 18.8%	101 26.3%	107 27.9%	11 2.9%
9	I use educational software (to learn things) outside school	62 16.1%	47 12.2%	131 34.1%	130 33.9%	14 3.6%
10	I make/design things on the computer outside school	68 17.7%	57 14.8%	126 32.8%	123 32.0%	10 2.6%
11	I use the Internet to revise for exams/tests outside school	56 14.6%	47 12.2%	117 30.5%	154 40.1%	10 2.6%
12	I organize the computer files/memory/systems outside school	64 16.7%	77 20.1%	116 30.2%	118 30.7%	9 2.3%
13	I watch TV/listen to radio/music on the Web outside school	59 15.4%	53 13.8%	116 30.2%	150 39.1%	6 1.6%
14	I download software from the Web outside school	60 15.6%	65 16.9%	120 31.3%	129 33.6%	10 2.6%
15	I watch DVDs/videos on the computer outside school	61 15.9%	67 17.4%	119 31.0%	127 33.1%	10 2.6%
16	I talk in chat rooms outside school	57 14.8%	65 16.9%	105 27.3%	142 37.0%	15 3.9%
17	I play computer games against other people on the Web outside school	53 13.8%	72 18.8%	90 23.4%	158 41.1%	11 2.9%

Table 5 (cont.)

18	I make films/animations outside school	93 24.2%	72 18.8%	100 26.0%	110 28.6%	9 2.3%
19	I make websites outside school	77 20.1%	86 22.4%	103 26.8%	104 27.1%	14 3.6%
20	I shop on the Internet outside school	71 18.5%	56 14.6%	94 24.5%	161 41.9%	2 0.5%

Note: Score 1 = Strongly Disagree, 2 = Disagree, 3 = Agree; 4 = Strongly Agree

The items which the students most strongly disagreed with, reflected by a score of 1, were "I make or use charts, graphs or tables outside school" (*n* = 93, 24.2 %) and "I make films/animations outside school" (*n* = 93, 24.2 %).

To determine if the student's responses to each item varied according to their gender, the grouped median (*Mdn*) scores for each item were computed. The grouped median scores for technology use inside and outside school by male and female students, ranked in order of magnitude from 1 to 20, are presented in Tables 6 and 7 respectively.

The highest ranked scores of the male students for technology use inside school (see Table 6) were for "I browse the Web for fun in school" (*Mdn* = 3.15); "I play games on the computer in school" (*Mdn* = 3.12) and "I write on the computer in school (*Mdn* = 3.09). In contrast, the highest ranked scores of the female students for technology use inside school were for "I use educational software (to learn things) in school" (*Mdn* = 3.11); "I use the Internet to look up information for school in school" (*Mdn* = 3.09); and "I use the Internet to revise for exams/tests in school" (*Mdn* = 3.05). The lowest ranked median scores of the male students for technology use inside school included "I make websites in school" (*Mdn* = 2.43) and"I shop on the Internet in school (*Mdn* = 2.53). The lowest ranked scores of the female students for technology use inside school included "I talk in chat rooms in school" (*Mdn* = 2.46) and "I play computer games against other people on the Web in school" (*Mdn* = 2.47).

Table 6

Ranked Median Scores for 20 Items in Survey of Technology Usage In School by Gender

Item		**Grouped Median Score**			
		Male *n* = 185		**Female *n* = 199**	
		Score	Rank	Score	Rank
1	I write on the computer in school	3.09	3	2.95	5
2	I use the Internet to look up information for school in school	3.08	4	3.09	2
3	I browse the Web for fun in school	3.15	1	2.86	6
4	I fiddle around looking at different things in school	2.64	17	2.83	8
5	I send e-mails in school	2.49	20	2.72	12
6	I play games on the computer in school	3.12	2	2.80	9
7	I draw/play with images/photos/pictures in school	2.81	11	2.76	11
8	I make or use charts, graphs or tables in school	2.86	9	2.98	4
9	I use educational software (to learn things) in school	3.05	6	3.11	1
10	I make/design things on the computer	2.83	10	2.84	7
11	I use the Internet to revise for exams/tests in school	2.96	8	3.05	3
12	I organize the computer files/memory/systems in school	3.06	5	2.79	10
13	I watch TV/listen to radio/music on the Web in school	2.76	14	2.58	16
14	I download software from the Web in school	2.70	16	2.64	14
15	I watch DVDs/videos on the computer in school	2.72	15	2.63	15
16	I talk in chat rooms in school	2.80	13	2.46	19

Table 6 (cont.)

17	I play computer games against other people on the Web in school	2.99	7	2.47	18
18	I make films/animations in school	2.81	12	2.69	13
19	I make websites in school	2.58	18	2.43	20
20	I shop on the Internet in school	2.53	19	2.58	17

Table 7

Median Scores for 20 Items in Survey of Technology Usage Outside School by Gender

Item		**Grouped Median Score**			
		Male *n* **= 185**		**Female** *n* **= 199**	
		Score	Rank	Score	Rank
1	I write on the computer outside school	2.85	10	3.18	7
2	I use the Internet to look up information for school outside school	3.15	3	3.26	3
3	I browse the Web for fun outside school	3.30	1	3.39	1
4	I fiddle around looking at different things outside school	2.71	14	3.08	14
5	I send e-mails outside school	2.66	16	2.95	17
6	I play games on the computer outside school	3.14	4	3.28	2
7	I draw/play with images/photos/pictures outside school	2.74	12	3.01	16
8	I make or use charts, graphs or tables outside school	2.38	19	2.87	20
9	I use educational software (to learn things) outside school	2.93	9	3.17	8
10	I make/design things on the computer outside school	2.72	13	3.13	12
11	I use the Internet to revise for exams/tests outside school	3.12	5	3.24	4
12	I organize the computer files/memory/systems outside school	2.67	15	3.04	15

Table 7 (cont.)

13	I watch TV/listen to radio/music on the Web outside school	3.12	6	3.16	9
14	I download software from the Web outside school	2.79	11	3.15	10
15	I watch DVDs/videos on the computer outside school	2.62	17	3.19	6
16	I talk in chat rooms outside school	3.02	7	3.14	11
17	I play computer games against other people on the Web outside school	3.16	2	3.11	13
18	I make films/animations outside school	2.33	20	2.94	18
19	I make websites outside school	2.43	18	2.87	19
20	I shop on the Internet outside school	3.00	8	3.23	5

The highest ranked median score of the male students for technology use outside school (see Table 7) was for “I browse the Web for fun outside school” (*Mdn* = 3.30). The highest ranked median score for the female students for technology use inside school was also for “I browse the Web for fun outside school” (*Mdn* = 3.39). The second highest ranked score for technology use of male students outside school was for “I play computer games against other people on the Web outside school” (*Mdn* = 3.16). The second highest ranked score for technology use of female students outside school was for “I play games on the computer outside school” (*Mdn* = 3.28).

The female students tended to use technology outside school more than male students for serious educational purposes. For example, the median score for “I use the Internet to look up information for school outside school” was higher for the female students (*Mdn* = 3.26) than for the male students (*Mdn* = 3.15). The median score for “I use educational software (to learn things) outside school” was higher for the female students (*Mdn* = 3.17) than for the male students (*Mdn* = 2.93). The median score for "I use the Internet to revise for exams/tests outside school" was higher for the female students (*Mdn* = 3.17) than for the male students (*Mdn* = 2.93).

The lowest ranked median scores of both male and female students for technology use outside school were for similar serious applications, specifically "I make websites outside school" (ranked 18 for males and 19 for females); "I make or use charts, graphs or tables outside school" (ranked 19 for males and 20 for females); and "I make films/animations outside school" (ranked 20 for males and 18 for females).

Descriptive Statistics

Due to the missing values (see Tables 4 and 5) it was not possible to operationalize the two dependent variables (Technology Use Inside School and Technology Use Outside School) by simply averaging the 20 item scores for each participant. The missing values had to be replaced using the "Replace Missing Values" procedure in SPSS prior to averaging the 20 scores for each participant. The frequency distributions of the two reliably measured dependent variables including the replaced missing values are illustrated using histograms in Figure 2. The modes were not at the centers of the distributions, reflecting their deviation from normality.

Table 8 presents the descriptive statistics for Technology Use Inside and Outside School. The averages of the 20 item scores ranged from 1.00 to 4.00. The frequency distributions were negatively skewed, reflected by the negative skewness statistics (-.263 and -.679 respectively). The modes (highest frequencies) were not central, but were on the right hand sides of the distributions, and the mean and the median scores were greater than 2.5 (the central score).

The mean (*M*) and standard deviation (*SD*) of the scores operationalized for Technology Use Inside and Outside School classified by Gender and Grade are presented in Table 9. Across the four grades, the mean scores for technology use inside school were similar (*M* = 2.72, SD = 0.83

for males vs. *M* = 2.71, *SD* = 0.63 for females). Across the four grades, the mean scores for technology use outside school tended to be higher for the females (M = 2.97, SD = 0.56) than for the males (*M* = 2.72, *SD* = 0.80).

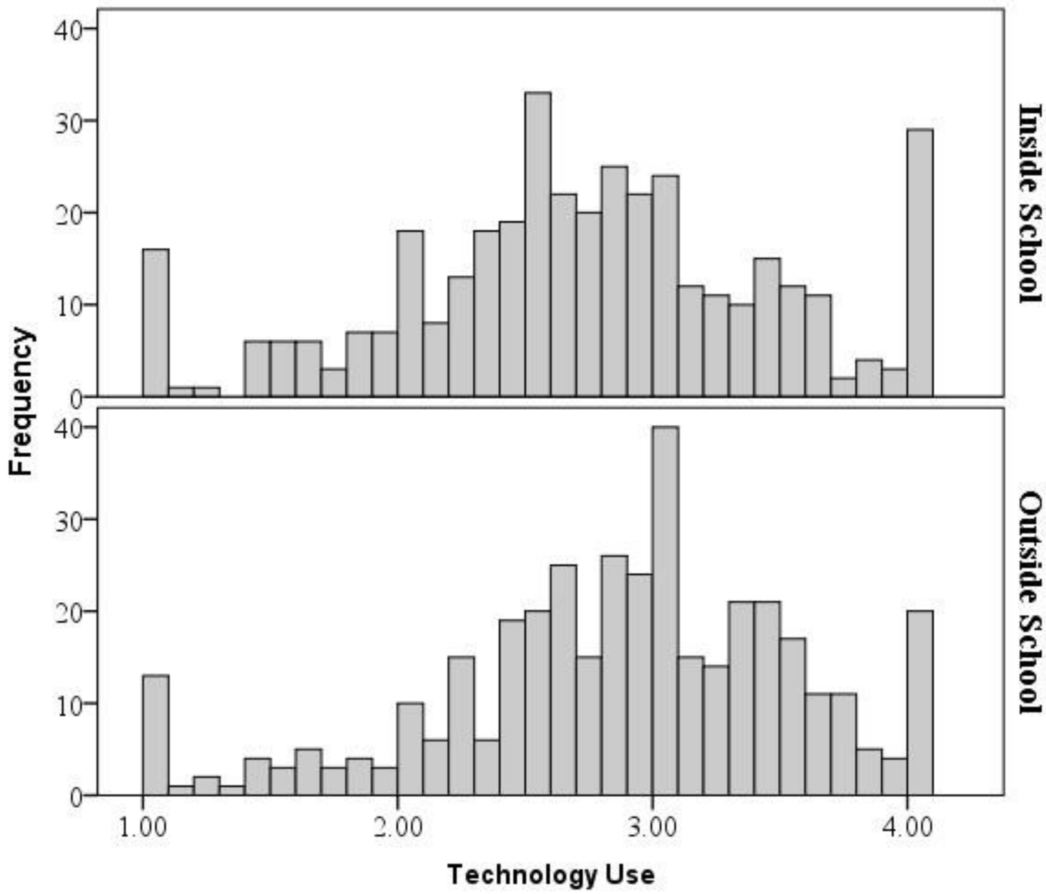

Figure 2. Frequency Distribution Histogram for Technology Use Inside and Outside School

Table 8

Descriptive Statistics for Technology Use Inside and Outside School (N = 384)

Statistic	**Inside School**	**Outside School**
N	384	384
Minimum Score	1.00	1.00
Maximum Score	4.00	4.00
Skewness	-.263	-.679
Mean Score	2.72	2.85
SD	0.73	0.70
Median Score	2.70	2.95

Table 9

Descriptive Statistics for Technology Use Inside and Outside School by Gender and Grade

Dependent Variable	**Gender**	**Grade**	**Mean Score**	**SD**	**N**
Technology Use Inside School	Male	Six	2.36	0.99	49
		Seven	2.81	0.52	49
		Eight	2.99	0.68	35
		Nine	2.81	0.91	52
		Total	2.72	0.83	185
	Female	Six	2.59	0.55	50
		Seven	2.95	0.71	49
		Eight	2.73	0.57	50
		Nine	2.58	0.64	50
		Total	2.71	0.63	199
Technology Use Outside School	Male	Six	2.37	0.85	49
		Seven	2.73	0.55	49
		Eight	3.18	0.57	35
		Nine	2.72	0.93	52
		Total	2.72	0.80	185
	Female	Six	3.09	0.49	50
		Seven	2.98	0.56	49
		Eight	2.91	0.53	50
		Nine	2.92	0.64	50
		Total	2.97	0.56	199

Table 9 shows that the mean scores were dependent on the grade levels of the students. Among the male students, the mean scores for Technology Use Inside School increased from *M* = 2.36 to 2.99 between Grade Six and Grade Eight, then declined to *M* = 2.72 in Grade Nine. Among the female students, the mean scores for Technology Use Inside School increased from *M* = 2.59 to 2.95 between Grade Six and Grade Seven, then declined to *M* =2.58 by Grade Nine. Among the male students, the mean scores for Technology Use Outside School increased from *M* = 2.37 to 3.18 between Grade Six and Grade Eight, then declined to *M* = 2.72 in Grade Nine.

Among the female students, the mean scores for Technology Use Outside School declined from *M*= 3.09 in Grade Six to *M* = 2.92 in Grade Nine. Consequently, the effects of gender and grade on the use of technology appeared to depend on a combination of both gender and grade. A descriptive comparison of the mean scores indicated that the gender difference role in the use of technology for learning was not very clear.

Multivariate Statistics

The tests to determine if the assumptions of MANOVA were violated are presented in Table 10. The Shapiro Wilks tests indicated that the frequency distributions of the dependent variables deviated significantly from normality ($p < .001$); however, there were no outliers (i.e., excessively small or large values) indicated by Z-scores within the expected limits of ± 3.0, the Mahalanobis D^2 statistics were not significant (p > .05). Box's Test indicated that the covariance matrices were significantly unequal (M (21, 431) = 102.70, $p < .001$). Levene's test indicated that the variances were also significantly unequal (F (7, 736) = 7.24, $p < .001$ for Technology Use Inside School and F (7, 736) = 5.70, $p < .001$ for Technology Use Outside School).

Table 10

MANOVA Tests of Assumptions

Test
Normality
Technology Use Inside School
Technology Use Outside School Outliers(Z scores)
Outliers (Mahalanobis D^2)
Equality of Covariance Matrix
Equality of Variance
Table 10 (cont.)
Technology Use Inside School
Technology Use Outside School
Correlation between Technology Use Inside and Outside School

There was a significant positive correlation between Technology Use Inside and Outside School for all the participants (Pearson's r (N = 384) = .211, p = .001). This relationship, which justified the use of MANOVA with two correlated dependent variables, is illustrated using a scatterplot fitted with a linear trend line in *Figure 3*.

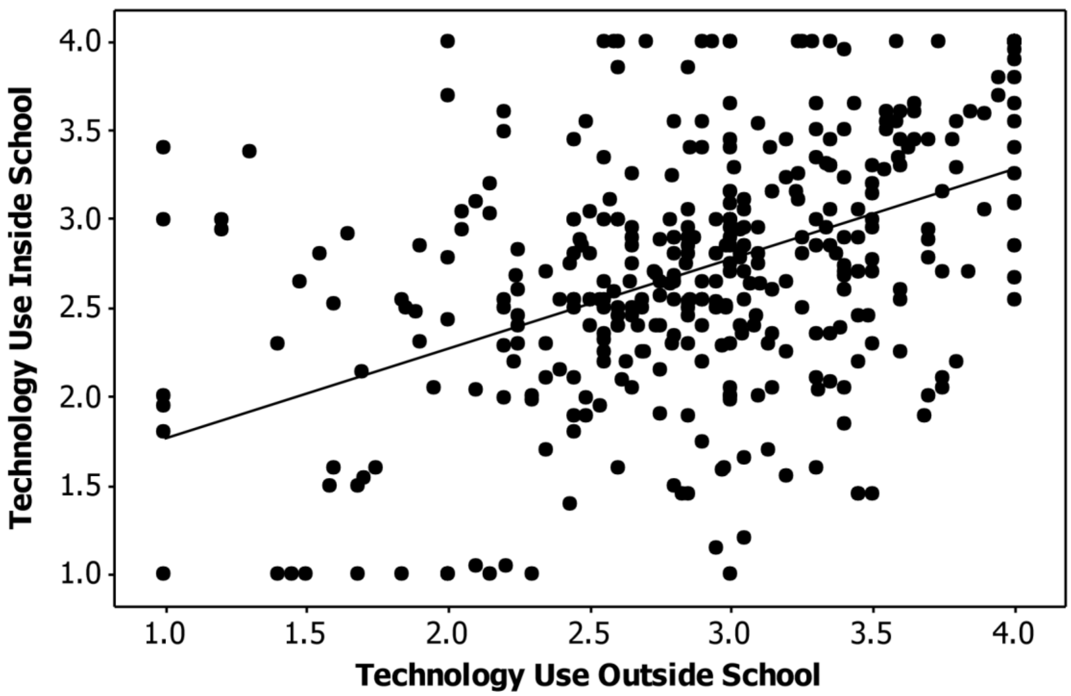

Figure 3. Correlation of Technology Use Inside School vs. Technology Use Outside School

The data violated the assumptions of MANOVA with respect to normality, equality of covariance matrices, and equality of variance; however, these violations were considered not to compromise the statistical inferences of MANOVA, because (a) the total sample size was large (N = 384); (b) the number of participants in each group in the sample design matrix was large (n > 30); and (c) the sampling design matrix was balanced because there were approximately equal proportions of male and female students in each grade (Huberty & Olejnik, 2006).

The results of the MANOVA multivariate tests (2 Gender, 4 Level), are presented in Table 11. Wilk's Lambda was used as the test statistic, and partial eta squared as the effect size.

Table 11

MANOVA Multivariate Tests for Differences between Mean Scores

Effect	**Wilk's Lambda**	**Hypothesis df**	**Error df**	**P**	**Partial Eta Squared (Effect Size)**
Gender	.968	2	367	.003*	.032
Grade	.930	6	734	<.001*	.036
Gender x Grade	.922	6	734	<.001*	.040
Order	.990	2	367	.168	.010
Gender x Order	.999	2	367	.871	.001
Grade x Order	.973	6	734	.123	.014
Gender x Grade * Order	.992	6	734	.824	.004

* Significant difference between mean scores ($p < .01$)

The main effects of gender were both significant at the .01 level. The main effects of gender and grade were however, obscured by the strong significant interaction effect between gender x grade. The order in which the respondents answered the questions (coded by 1 = inside school followed by out school, and 2 = outside school followed by inside school) as well as the interactions between order, grade, and gender were not significant, indicated by $p > .1$ for the Wilk's lambda statistics, and negligible effect sizes (partial eta squared = .001 to .014).

Excluding the non-significant order effects, the between-subjects effects of grade and gender on the technology use inside and outside school are considered separately using one-way ANOVA in Table 12.

Table 12

One-way ANOVA Univariate Tests for Differences between Mean Scores

Effect	Dependent Variable	df1	df2	F	P	Partial Eta Squared (Effect size)
Gender	Technology Use Inside School	1	376	0.16	.158	.000
	Technology Use Outside School	1	376	10.89	.001*	.028
Grade	Technology Use Inside School	3	376	6.55	<.001*	.050
	Technology Use Outside School	3	376	3.53	.015*	.027
Gender x Grade	Technology Use Inside School	3	376	2.93	.034*	.023
	Technology Use Outside School	3	376	8.44	<.001*	.063

The main effects of gender and grade indicated by one-way ANOVA were that (a) the mean scores for Technology Use Inside School were not significantly different between male and female students (b) the mean scores for Technology Use Outside School were significantly different between male and female students with the female higher (c) the mean scores for Technology Use Inside School were significantly different between the four grades with grads six been lower from the other grads (d) the mean scores for Technology Use Outside School were also significantly different between the four grades with grad six been lower from the other grads.

Scheffé’s post hoc tests were conducted to determine if the mean scores were significantly different between the four grade levels. The homogenous subsets of mean scores are presented in Table 13 for Technology Use Inside School and Table 14 for Technology Use Outside School (combined for both male and female students).

Table 13

Scheffé's Homogeneous Subsets of Mean Scores for Technology Use Inside School

Grade	*n*	Subset	
		1	2
Six	99	2.48	
Nine	102		2.70
Eight	85		2.83
Seven	98		2.88

Table 14

Scheffé's Homogeneous Subsets of Mean Scores for Technology Use Outside School

Grade	*n*	Subset	
		1	2
Six	99	2.74	
Nine	102		2.82
Seven	98		2.85
Eight	85		3.02

The mean scores located within the same subset (i.e., 1 or 2) are not significantly different from each other ($p > .05$). The mean scores separated into subsets 1 and 2 are significantly different from each other ($p < .05$). The mean scores for technology use inside school were significantly lower in Grade Six than in grades Seven, Eight, and Nine. The mean scores for technology use outside school were significantly lower in Grade Six and Grade.

Therefore, without taking gender into account, the older students in Grades Seven, Eight, and Nine tended to use technology significantly more both inside and outside school more than the younger students in Grade Six. However, this grade level main effect is tempered by grade x gender interaction.

The results confirmed that the main effects of gender and grade were not independent, but were obscured by the significant interaction between gender x grade for Technology Use Inside

School (*F* (3, 376) = 2.93, *p* = .034, effect size = .023) as well as for Technology Use Inside Outside School (F (3, 376) = 8.44, *p*<.001, effect size = .063).

The significant interactions between gender x grade are illustrated using line plots in Figures 4 and 5. The lines were not parallel, reflecting disordinal interactions, meaning that the differences between the scores for the dependent variables switched depending on the relative levels of the independent variables, and how they were combined (Hair et al., 2010). The interaction plots indicated that (a) among the male students, the mean scores for Technology Use Inside School increased between Grade Six and Grade Eight, then declined in Grade Nine; (b) Among the female students, the mean scores for Technology Use Inside School to increased between Grade Six and Grade Seven, then declined by Grade Nine; (c) Among the male students, the mean scores for Technology Use Outside School increased between Grade Six and Grade Eight, then declined in Grade Nine; and (d) Among the female students, the mean scores for Technology Use Outside School declined between Grade Six and Grade Nine.

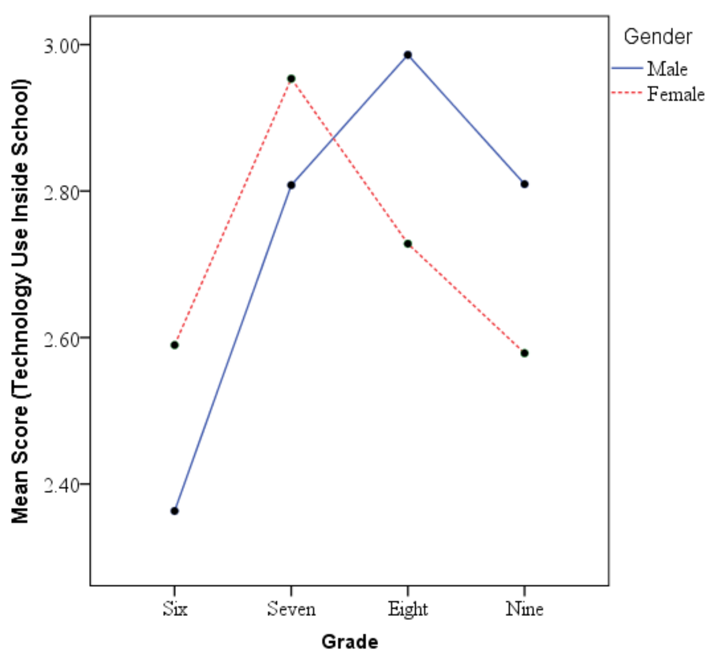

Figure 4. Disordinal Interaction of Gender x Grade for Technology Use Inside School

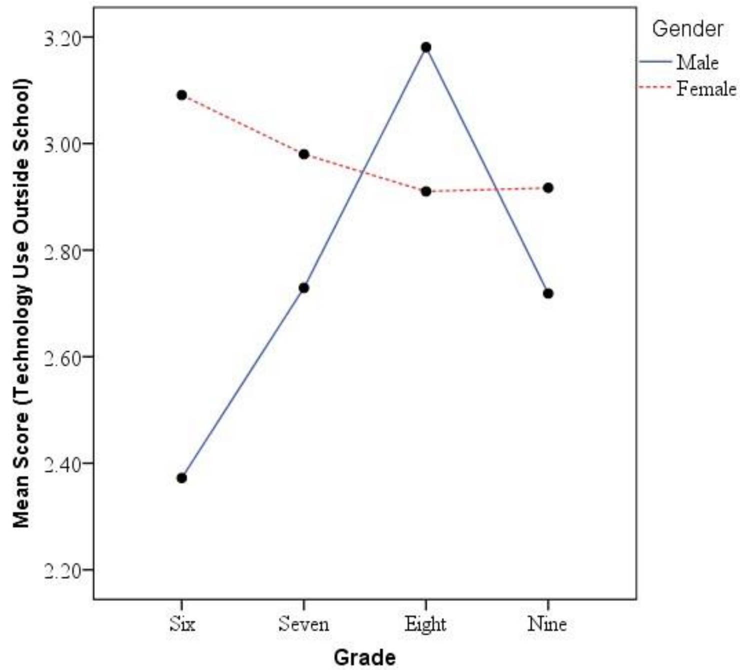

Figure 5. Disordinal Interaction of Gender x Grade for Technology Use Outside School

Summary

The descriptive statistics based on the administration of a survey identified the measurement indicators and their reflection on the use of electronic technology inside and outside schools among Kuwaiti students at the intermediate education level indicated that the frequency distributions for Technology Use Inside and Outside the School were strongly skewed. The descriptive statistics based on a 4-point measurement scale indicated that most of the students tended to agree with all of the items in the survey.

A qualitative difference was found between technology usage by male and female students. Male students tended to use technology in school mainly for entertainment (e.g., to browse the Web for fun and play games), whereas the female students tended to use technology in school mainly for education (e.g., to learn things, look up information, and revise for exams/tests). The primary usage of technology for both male and female students outside school was for entertainment, but female students tended to use technology outside school for education more than male students.

Across the four grades, the mean scores for Technology Use Inside School were similar for both males and females. In contrast, the mean scores for Technology Use Outside School tended to be higher for the females than for the males. The older students in Grades Seven, Eight, and Nine tended to use technology significantly more both inside and outside school than the younger students in Grade Six. The results of MANOVA indicated that the order in which the respondents answered the two sections of the questionnaire, and the interactions between order, grade, and gender had no significant effects. The main effects of gender and grade on Technology Use Inside and Outside the School were found not to be independent. A significant interaction occurred between gender and grade. Because this interaction was disordinal, then the main effects of gender and grade could not be very clearly interpreted, because they were not consistent between the groups (Hair et al, 2010).

CHAPTER V

DISCUSSION AND CONCLUSIONS

A self-report questionnaire was administered to identify the measurement indicators and their reflection on the use of electronic technology inside and outside schools among Kuwaiti students at the intermediate education level. A counterbalanced survey design was utilized to control for potential order effects (because the two sections of the questionnaire measured technology use within two different contexts, inside or outside the school); however, no significant order effects were found. The major findings of this study are summarized and discussed in order to address the six research questions, in the context of the literature.

The results of an analysis of the frequency distributions and descriptive statistics derived from the questionnaire item scores were interpreted to address the following two questions:

1. What are the indicators and students reflection on the use of technology inside schools among Kuwaiti students at the intermediate education level?

2. What are the indicators and students reflection on the use of technology outside schools among Kuwaiti students at the intermediate education level?

3. What are the indicators and students reflection on the use of technology inside schools on Kuwaiti students according to their gender at the intermediate education level?

4. What are the indicators and students reflection on the use of technology outside schools on Kuwaiti students according to their gender at the intermediate education level?

5. What are the indicators and students reflection on the use of technology inside schools on Kuwaiti students according to their grade levels at the intermediate education level?

6. What are the indicators and students reflection on the use of technology outside schools on Kuwaiti students according to their grade levels at the intermediate education level?

Subsequently, the implications of the findings are discussed with citations from the literature to support the arguments. The chapter ends with the conclusions and recommendations for educational practice and future research

Use of Electronic Technology Inside Schools

The descriptive statistics indicated that most of the students tended to agree with all of the items in the questionnaire concerning use of technology inside schools. Consistent agreement was reflected by the median scores between 2.4 and 3.1 for each of the 20 items by both males and females. The most strongly endorsed items reflecting the use of technology inside school, were “I use the Internet to look up information for school in school”; “I use the Internet to revise for exams/tests in school”; and “I use educational software (to learn things) in school”. In school, therefore, the students generally tended to use technology for serious educational purposes. It is likely that the teachers would endorse this uses. These findings were consistent with many other researchers who have found during the last25 years that the use of technology inside schools for educational purposes is generally reported by students (e.g., Blasco-Arcas et al. 2013; Butefish 1999; Campbell et al., 1996; Erena et al., 2008; Guthrie, 1991; Haugland & Wright, 1997; Richardson et al., 2014; Saba (2009).

Use of Electronic Technology Outside Schools

The descriptive statistics indicated that most of the students tended to agree with all of the items in the questionnaire concerning use of technology outside schools. Consistent agreement was reflected by median scores between 2.7 and 3.2 for the 20 items by both male and female students. The most strongly endorsed items reflect the use of handheld technology outside school, were “I browse the Web for fun outside school”; “I use the Internet to look up information for school outside school"; "I shop on the Internet outside school" and "I play games on the computer outside school". These findings were consistent with other researchers who have found that the use of technology outside schools is generally reported by students for these uses (Facer, 2004; Gulek & Demirtas, 2005; Morgan & Ritter, 2002; Sutherland et al., 2003).

Use of Electronic Technology Inside and Outside Schools According to Gender and Grade

A descriptive analysis of the ranked median scores indicated that both male and female students across the four grades tended to use technology outside school primarily for entertainment (e.g., to browse the Web for fun and play games).The female students tended to use technology outside school more than male students for serious educational purposes, for example, using the Internet to look up information for school outside school, using educational software (to learn things) outside school, and using the Internet to revise for exams/tests outside school.

The results of the statistical analysis of the composited survey data using MANOVA to compare the use of electronic technology inside and outside schools according to the hypothesized independent main effects of gender and grade were not definitive. A statistically significant disordinal interaction between the effects of gender and grade was identified. It was not possible to provide clear statistical evidence to address research questions 4, 5, and 6 independently. Gender and grade were not independent variables, meaning that they did not have separate effects, but interacted with each other. Among the male students, the mean scores for Technology Use Inside School increased between Grade Six and Grade Eight, and then declined in Grade Nine. Among the female students, the mean scores for Technology Use Inside School increased between Grade Six and Grade Seven, and then declined between Grade Seven and Grade Nine. Among the male students, the mean scores for Technology Use Outside School increased between Grade Six and Grade Eight, and then declined in Grade Nine. In contrast, among the female students, the mean scores for Technology Use Outside School declined progressively between Grade Six and Grade Nine. Overall, excluding the effects of gender, the mean scores for technology use were significantly lower for the students in Grade Six compared to the mean scores for technology use in Grade Seven, Eight, and Nine.

The results of MANOVA indicated that the effect size of the disordinal interaction was very small (partial eta squared = .040) implying that only 4% of the variance in technology use was explained by the interaction between gender x grade. According to Ferguson (2009) the "recommended minimum effect size representing a 'practically' significant effect for social science data" (p. 25) using MANOVA is .04. Consequently, the very small magnitude of the interaction of gender x grade implied that (a) gender and grade had a very limited effect on technology use inside or outside school; and (b) this interaction may have very little or no meaningful effects on technology use in the context of interpreting and applying the results to educational policy and practice

Obviously, from the previous results, the use of technology inside and outside school for both genders has been dropped in the grade nine. In my opinion, there is a couple of reasons for this decline, (a) adolescence in this level be more carelessness and they do not failure to comply with tasks and homework, (b) in this stage teenagers start to go out with friends rather than staying at home under the control of parents.

Previous studies have indicated that there is a gender difference role in the use of technology for learning (Kahveci, 2010). From past studies, authors have concluded that technological use in learning is an activity that is dominant for male students, because male students appear to have a more positive attitude toward the use of technology for learning than female students (Kadijevich, 2000; Kirkup, 2007). The current study, however, did not provide statistical evidence to support the hypothesis that there is a consistent gender difference in attitude toward the use of technology for learning inside and outside school, because the gender differences in the response data were dependent on the grade.

Implications

The descriptive analysis of the responses to the Technology Usage Inside and Outside Schools Survey implied that most of the students tended to more or less agree to all of the items in the survey. The strong endorsement of the use of technology inside and outside schools by the students implied that the Kuwait Intermediate School Information Technology Project (KISITP) to introduce information technology at intermediate schools in Kuwaiti between grades five to eight (Al-Sadoun & Al-Furaih, Ebeid, 1997) is now reaping considerable benefits. In particular, the students' responses to the survey showed that they were generally achieving the goals of the KISITP, including (a) using technology as a tool for general purposes for supporting learning through the use of word processing, graphics, database telecommunication and other application packages.

Conclusion and Recommendations

The statistical analysis of the data collected in the Usage of Technology Inside and Outside School Survey using MANOVA indicated that the male students in all grades did not consistently endorse the use of technology more than the female students, which was not consistent with the results of previous research, concluding that technological use in learning is an activity that is dominant for male students (Kahveci, 2010; Kadijevich, 2000; Kirkup, 2007; Ono & Zavodny, 2004). The differences between the uses of technology by the males students compared to the female students were mainly qualitative and not quantitative. The male students tended to use technology in school more than the female students for entertainment (e.g., to browse the Web for fun and play games). The female students tended to use technology in school more for serious educational purposes (e.g., to learn things, look up information, and revise for exams/tests) but rarely for entertainment (e.g., talking in chat rooms and playing computer games).

The effect sizes were very small; implying the results of the statistical analysis had little practical significance (Ferguson, 2009). Consequently, it is difficult to make practical recommendations for educational practice based on the interacting effects of gender and grade on the use of technology inside and outside schools. According to Hair et al. (2010) the identification of a significant disordinal interaction between the variables that are hypothesized to have the main effects on a dependent variable using ANOVA or MANOVA implies that the research design is flawed, and that the research should be redesigned in a different way to ensure that the main effects are clarified. Consequently, the only practical recommendation of this study is that more research is required to clarify the differences between the use of technology by male and females across the grades, as described below in the Future Research section.

Reservations and Limitations

The population from which the participants were drawn consisted of Kuwaiti students aged from 11 to 14 years, at the sixth, seventh, eighth, and ninth grades, in the intermediate education level at two randomly chosen schools in Kuwait. The administration of the two schools was different: the boy’s school was a modern school and the girl’s school was a traditional school, which may have influenced the results.

The total sample size used in this study was 384 students. The publication of the results of underpowered studies (i.e., when the sample size of the participants in each group is too small to provide valid statistical inferences) is unethical (Maxwell & Kelly, 2011). This study was not underpowered. A power analysis indicated that the sample size was large enough to avoid Type

II errors in the interpretation of inferential statistics (i.e., the false declaration of results that were not significant when, in fact, they should be significant). The sampling design matrix was balanced. There were approximately equal proportions of male and female students. Approximately one quarter were in Grade Six one quarter in Grade Seven one quarter in Grade Eight and one quarter in Grade Nine. The large sample size and balanced sampling design helped to improve the power and to reduce the effects of violations of the assumptions of the inferential statistics (MANOVA) used to test four of the hypotheses (Huberty & Olejnik, 2006). The large sample size, however, did not alleviate the interacting effects of grade and gender on the measures of technology use inside and outside schools, which meant that the results were not definitive.

The main statistical limitation of the sampling method was that, although the schools were chosen at random, the sample of students was not drawn randomly from the population, because participation in the study was voluntary. Students who volunteer to participate in a survey or experiment in an educational setting may provide different results to students who do not, and so the conclusions may be limited by sampling bias (Fraenkel & Wallen, 2010). Nevertheless, the sample used in this study was considered to be a fair representation of intermediate education level students who used technology in schools in Kuwait for various activities (e.g., word, data, and image processing, sending emails, internet browsing and searching) and also used technology in their homes to carry out various activities. The researcher believes, therefore, that the results can be generalized to the population.

A possible limitation of the results of this study was response bias, referring to the collection of invalid and unreliable results caused by the distorted answer patterns of some respondents to self-report survey concerning social, health, educational, and business issues (Paulhus, 1991). According to Paulhus, respondents can potentially provide biased responses for many reasons, including (a) they are naturally very polite and respectful, and to avoid any type of argument or social risk-taking, so provide responses which they think the researcher will agree with; (b) they perceive themselves to be of lower educational and/or social status than the researcher, and so they defer to the researcher's authority by endorsing what they think the researcher believes to be true; (c) they do not provide their own individual answers, based on their own knowledge, but provide answers which represent the collective knowledge or norms of their own group or culture; (d) they are too busy, distracted, or bored to provide accurate answers; and (e) they answer the questionnaire in a manner that makes themselves and/or their organizations look good, usually by consistently over-reporting "good" behavior and underreporting "bad" behavior. I have noticed all these reasons that Paulhus mentioned in my study.

There is evidence to suggest that extreme response bias is a limitation of the survey data collected by self-report survey administered in Middle Eastern Arab societies. Extreme response bias refers to a cultural communication style characterized by a significantly high polarized pattern in the answer patterns to survey items (Baron-Epel et al., 2010; House, 2004; Minkov, 2010; Smith, 2004). Polarized means that the response data are consistently positively or negatively skewed toward one or other extreme end of the measurement scales or ratings used in the survey. Analysis of the frequency distributions of the responses to the Survey of Technology Usage Inside and Outside Schools used in the current study revealed that the modes (i.e., the scores endorsed by the highest frequencies of respondents) were consistently 3 = Agree or 4 = Strongly Agree. The median scores for each item were generally centered around 3 = Agree. Because the majority of the students tended to agree with the items, it is possible that extreme response bias may possibly have distorted at least some of the results of the current study. However, the researcher did not witness such behavior.

The final reservation of this study was that it was not possible to identify causal relationships use a simple inferential statistical analysis of survey item scores collected in a cross-sectional survey (Pearl, 2009). For this reason, some educational researchers have suggested that inferential statistics involving hypothesis tests should be reduced in importance for research in education. The reason for this suggestion is that inferential test statistics and p-values do not always provide definitive results that can be used to identify the outcomes of educational interventions or provide definitive evidence to make policy decisions for curriculum development (Fraenke & Wallen, 2010; Levin, 1998; Hubbard & Lindsay, 2008; Nix & Barnette, 1998). A national survey revealed considerable disagreement between the members of the American Education Research Association regarding the applications of statistical significance tests and other statistical issues to support educational practice, and 18% agreed that they should be banned or abandoned (Mittag & Thompson, 2000). Because the findings of this study could not clearly be applied to make recommendations for educational practice, the researcher also tends to be in agreement. However, studies of this nature allow for avenues of additional study to be explored.

Future Research

This study attempted to reveal answers to research questions concerning (a) what are the modern measurement indicators of the use of electronic technology inside and outside schools among Kuwait intermediate level students? And (b) how does the use of handheld electronic technology inside and outside schools vary between males and females across four grades? Although the findings indicated what the students used technology for, they did not reveal why the use of handheld electronic technology varied between males and females across the four grades at intermediate level, or why the use of technology was important in relation to the learning performance of the students. The answers to more difficult research questions beginning with “Why”, suggest the need for further research to understand the complex relationships between hypothetical causes (e.g., the gender and grade of the students) and hypothetical effects (e.g., the use of technology for different purposes and its impact on learning performance).

Although it has been suggested that the use of technology inside and outside schools can improve students’ engagement in school work (Gulek & Demirtas, 2005) as well as the quality of a learner's work (Saba, 2009) more evidence is required to confirm this suggestion in the context of handheld technology. One recommended approach to future research is the application of theoretical models which attempt to explain (a) the reasons why students choose to use electronic technology inside and outside school; and (b) why the use of educational electronic technology inside and outside school helps to improve the students’ learning performance.

Several models have been posited in the literature which may help to answer these complex questions. These models need to be validated by structural equation modeling, which provides more useful results than simple inferential statistics, because this sophisticated modern method takes into account the correlations and interactions between the independent variables when predicting their effects on the dependent variables (Kline, 2004; 2010).

The Technology Acceptance Model (Davis et al., 1989) outlined diagrammatically in Figure 6 could be used to explain why students actually choose to use systems such as electronic technology inside and outside schools. The Technology Acceptance Model includes two components that were measured in the current study (External Variables, specifically the gender and grade levels of the students); and Actual System Use (measured with the Survey of Technology Usage Inside and Outside Schools).

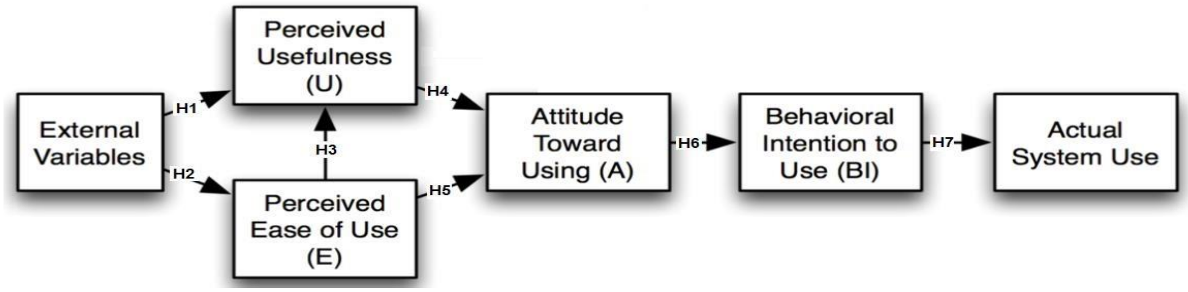

Figure 6. Technology Acceptance Model (Davis et al. 2009)

Between the External Variables and Actual System Use are four intervening variables that are independent of the external variables, which help to explain why users choose a particular system. Perceived usefulness (U) was defined by Davis et sl. (1989) as the degree to which a person believes that using a particular system would enhance his or her performance. Perceived ease-of-use (E) was defined as the degree to which a person believes that using a particular system would be free from effort. Attitude Toward Using includes the answers to questions to reveal the users' perceptions of the technology system in question, such as "Using this system is a good idea"; "Using this system makes learning more interesting"; "Using this system is fun". "Behavioral Intention to Use" means that the user intends, predicts, or plans to use the tool in the future. Using the Technology Acceptance Model as a theoretical framework, future research could be conducted in Kuwait to test the following hypotheses:

H1. Perceived Usefulness (of handheld electronic technology inside and outside schools) varies with respect to external variables associated with the characteristics of the respondents (e.g., the gender and grade levels of students).

H2. Perceived Ease of Use (of electronic technology inside and outside schools) varies with respect to external variables associated with the characteristics of the respondents (e.g., the gender and grade levels of students).

H3. Perceived Ease of Use is a significant predictor of Perceived Usefulness.

H4. Perceived Ease of Use is a significant predictor of Attitude Toward Using (electronic technology inside and outside school).

H5. Perceived Usefulness is a significant predictor of Attitude Toward Using.

H6. Attitude Toward Using is a significant predictor of Behavioral Intention to Use (electronic technology inside and outside school).

H7. Behavioral Intention to Use is a significant predictor of Actual System Use. The current study focused mainly on Actual System Use (e.g., by requesting responses to survey items about how technology was used inside and outside school for writing, using the Internet, using educational software, watching TV/videos, sending emails, playing games, drawing/playing with images/photos/pictures, etc.). In contrast, the Learning Performance Model attempts to explain the relationships between interactivity with peers and teachers, active collaborative learning, engagement, and learning performance in the context of technology enhanced education (Blasco-Arcas et al, 2013). The Learning Performance Model is outlined diagrammatically in Figure 7. Future research could be conducted to explain why the actual use of electronic technology inside and outside schools in Kuwait helps to improve the students' learning performance, underpinned by the theoretical framework of the Learning Performance Model.

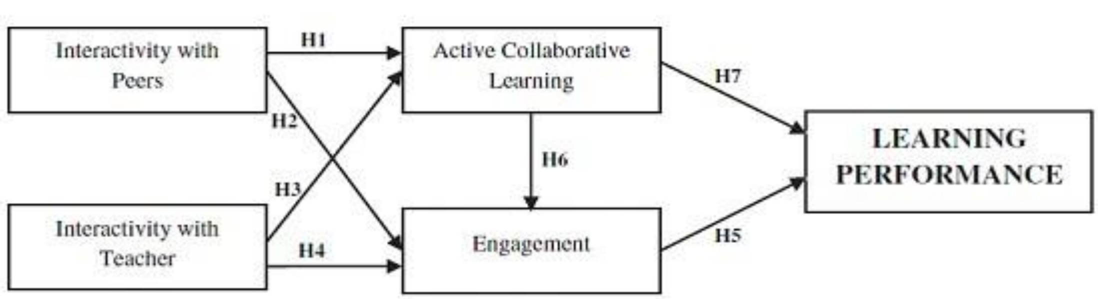

Figure 7. Learning Performance Model (Blasco-Arcas et al. 2013).

Future research could be conducted to test the following hypotheses:

H1: Interactivity with peers as a result of using technology inside and outside school increases the students' active collaborative learning

H2: Interactivity with peers as a result of using technology inside and outside school enhances the students' engagement

H3: Interactivity with teachers as a result of using technology inside and outside school improves students' active collaborative learning

H4: Interactivity with teachers as a result of using technology inside and outside school enhances the students' engagement

H5: Engagement as a result of using technology inside and outside school improves the students' learning performance

H6: Active collaborative learning as a result of using technology inside and outside school enhances the students' engagement

H7: Active collaborative learning as a result of using technology inside and outside school improves students' learning performance.

Future research may help to explain why technology is important in relation to improving the learning performance of students, and why the use of handheld technology varies significantly for different purposes between males and females across successive grades at school. The proposed theoretical frameworks and hypotheses are also applicable to research on the use of technology by other populations, including students at many different levels, in Kuwait and elsewhere, ranging from fourth grade intermediate level to University undergraduates.

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APPENDICES

APPENDIX A: IRB Approval Letters

MIDDLE TENNESSEE STATE UNIVERSITY

3/31/2016
Investigator: Waleed Alanzi
Department: Health and Human Performance
Investigator Email: Wa2p@mtmail.mtsu.edu; don.belcher@mtsu.edu Protocol Title: "Modern Measurement Indicators and their Reflection on the Use of Handheld Electronic Technology inside and outside the School among Kuwaiti"
Protocol Number: 16-2101
Dear Investigator(s),
The MTSU Institutional Review Board, or a representative of the IRB, has reviewed the research proposal identified above. The MTSU IRB or its representative has determined that the study poses minimal risk to participants and qualifies for an expedited review under 45 CFR 46.110 and 21 CFR 56.110, and you have satisfactorily addressed all of the points brought up during the review.
Approval is granted for one (1) year from the date of this letter for 500 participants.
Please note that any unanticipated harms to participants or adverse events must be reported to the Office of Compliance at (615) 494-8918. Any change to the protocol must be submitted to the IRB before implementing this change.
You will need to submit an end-of-project form to the Office of Compliance upon completion of your research located on the IRB website. Complete research means that you have finished collecting and analyzing data. **Should you not finish your research within the one (1) year period, you must submit a Progress Report and request a continuation prior to the expiration date.** Please allow time for review and requested revisions. Failure to submit a Progress Report and request for continuation will automatically result in cancellation of your research study. Therefore, you will not be able to use any data and/or collect any data. Your study expires **3/31/2017.**
According to MTSU Policy, a researcher is defined as anyone who works with data or has contact with participants. Anyone meeting this definition needs to be listed on the protocol and needs to complete the required training. **If you add researchers to an approved project, please forward an updated list of researchers to the Office of Compliance before they begin to work on the project.**
All research materials must be retained by the PI or faculty advisor (if the PI is a student) for at least three (3) years after study completion and then destroyed in a manner that maintains confidentiality and anonymity.
Sincerely,
Shelley C. Moore, PhD, MSN, RN, COI
Institutional Review Board
Middle Tennessee State University

APPENDIX B: Survey of Technology Usage Inside Schools

Item No.	Item	Strongly disagree	Disagree	Agree	Strongly agree
1	I write on the computer in school				
2	I use the Internet to look up information for school in school				
3	I browse the Web for fun in school				
4	I fiddle around looking at different things in school				
5	I send e-mails in school				
6	I play games on the computer in school				
7	I draw/play with images/photos/pictures in school				
8	I make or use charts, graphs or tables in school				
9	I use educational software (to learn things) in school				
10	I make/designing things on the computer (Like hats, posters, invites) in school				
11	I use the Internet to revise for exams/tests in school				
12	I organize the computer files/memory/systems in school				
13	I watch TV/listen to radio/music on the Web in school				
14	I download software from the Web in school				
15	I watch DVDs/videos on the computer in school				
16	I talk in chat rooms in school				
17	I play computer games against other people on the Web in school				
18	I make films/animations in school				
19	I make websites in school				
20	I shop on the Internet in school				

APPENDIX C: Survey of Technology Usage Outside Schools

Items No.	Items	Strongly disagree	Disagree	Agree	Strongly agree
1	I write on the computer outside school				
2	I use the Internet to look up information for school outside school				
3	I browse the Web for fun outside school				
4	I fiddle around looking at different things outside school				
5	I send e-mails outside school				
6	I play games on the computer outside school				
7	I draw/play with images/photos/pictures outside school				
8	I make or use charts, graphs or tables outside school				
9	I use educational software (to learn things) outside school				
10	I make/designing things on the computer (Like hats, posters, invites) outside school				
11	I use the Internet to revise for exams/tests outside school				
12	I organize the computer files/memory/systems outside school				
13	I watch TV/listen to radio/music on the Web outside school				
14	I download software from the Web outside school				
15	I watch DVDs/videos on the computer outside school				
16	I talk in chat rooms outside school				
17	I play computer games against other people on the Web outside school				
18	I make films/animations outside school				
19	I make websites outside school				
20	I shop on the Internet outside school				

APPENDIX D: Survey of Technology Usage Inside Schools (Arabic)

استخدام التكنولوجيا داخل المدرسة

رقم العبارة	العبارة	لا أوافق بشدة	لا أوافق	أوافق	أوافق بشدة
1	أنا أكتب على الكمبيوتر في المدرسة				
2	استخدام الإنترنت للبحث عن معلومات عن المدرسة في المدرسة				
3	تصفح الويب من أجل المتعة في المدرسة				
4	أنا كمان حول النظر في أشياء مختلفة في المدرسة				
5	إرسال رسائل البريد الإلكتروني في المدرسة				
6	ألعب الألعاب على الكمبيوتر في المدرسة				
7	أود أن ألفت / لعب مع الصور / الصور / الصور في المدرسة				
8	أجعل أو استخدام الرسوم البيانية والرسوم البيانية أو الجداول في المدرسة				
9	يمكنني استخدام البرمجيات التعليمية)لتعلم أشياء(في المدرسة				
10	جعل / تصميم الأشياء على الكمبيوتر)مثل القبعات والملصقات ويدعو(في المدرسة				
11	استخدام الإنترنت لمراجعة للامتحانات / اختبارات في المدرسة				
12	تنظيم ملفات الكمبيوتر / الذاكرة / نظم في المدرسة				
13	أشاهد التلفزيون / الاستماع إلى الراديو / الموسيقى على شبكة الإنترنت في المدرسة				
14	تحميل البرامج من الشبكة العنكبوتية في المدرسة				
15	مشاهدة أقراص الفيديو الرقمية / الفيديو على الكمبيوتر في المدرسة				
16	أتحدث في غرف الدردشة في المدرسة				
17	ألعب ألعاب الكمبيوتر ضد أشخاص آخرين على الويب في المدرسة				
18	أنا أصنع أفلاما / الرسوم المتحركة في المدرسة				
19	أنا أصنع المواقع في المدرسة				
20	أنا اتسوق على شبكة الإنترنت في المدرسة				

APPENDIX E: Survey of Technology Usage Outside Schools (Arabic)

استخدام التكنولوجيا خارج المدرسة

أوافق بشدة	أوافق	لا أوافق	لا أوافق بشدة	العبارة	رقم العبارة
				أنا أكتب على الكمبيوتر خارج المدرسة	1
				استخدام الإنترنت للبحث عن معلومات عن المدرسة خارج المدرسة	2
				تصفح الويب من أجل المتعة خارج المدرسة	3
				أنا كمان حول النظر في أشياء مختلفة خارج المدرسة	4
				إرسال رسائل البريد الإلكتروني خارج المدرسة	5
				ألعب الألعاب على الكمبيوتر خارج المدرسة	6
				أود أن ألفت / لعب مع الصور / الصور / الصور خارج المدرسة	7
				أجعل أو استخدام الرسوم البيانية والرسوم البيانية أو الجداول خارج المدرسة	8
				يمكنني استخدام البرمجيات التعليمية)لتعلم أشياء(خارج المدرسة	9
				جعل / تصميم الأشياء على الكمبيوتر)مثل القبعات والملصقات ويدعو(خارج المدرسة	10
				استخدام الإنترنت لمراجعة للامتحانات / اختبارات خارج المدرسة	11
				تنظيم ملفات الكمبيوتر / الذاكرة / نظم خارج المدرسة	12
				أشاهد التلفزيون / الاستماع إلى الراديو / الموسيقى على شبكة الإنترنت خارج المدرسة	13
				تحميل البرامج من الشبكة العنكبوتية خارج المدرسة	14
				مشاهدة أقراص الفيديو الرقمية / الفيديو على الكمبيوتر خارج المدرسة	15
				أتحدث في غرف الدردشة خارج المدرسة	16
				ألعب ألعاب الكمبيوتر ضد أشخاص آخرين على الويب خارج المدرسة	17
				أنا أصنع أفلاما / الرسوم المتحركة خارج المدرسة	18
				أنا أصنع المواقع خارج المدرسة	19
				أنا اتسوق على شبكة الإنترنت خارج المدرسة	20