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Enhancing Modern ICT in Saudi Arabian Public Schools

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Enhancing Modern ICT in Saudi Arabian Public Schools

By

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A Thesis

Submitted to the Faculty of Graduate Studies

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Enhancing Modern ICT in Saudi Arabian Public Schools

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22 September 2017

Declaration of Originality

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Abstract

 The incorporation of technology in education may provide students with new learning opportunities as well as improve the educational standards of a country (Alharbi, 2012). Technology has modified the role of traditional teachers, particularly in how information is transferred by teachers to students. Technology provides students with a means to be engaged learners, as opposed to passive recipients of information (Albrkhil, 2013). Technological disparities are widely experienced in public schools in Saudi Arabia. Generally, Saudi Arabian public schools face various difficulties: they often lack sufficient learning materials and current levels of communication between the Ministry of Education and public schools are insufficient (Albugami & Ahmed, 2015). The Ministry of Education has both encouraged and invested in the use of information and communications technology (ICT) in schools; however, to date the Ministry still has deficiency in implementing ICT (Aljuaid, 2016). This research explores the reasons behind this discrepancy and examine whether or not or to what degree the Ministry of Education has plans to develop the use of ICT in public schools. The study also assesses the relationship between the principals of public schools and the Ministry of Education in Saudi Arabia.

Keywords: students' learning, technology, Ministry of Education, ICT, educational system.

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Chapter One: Introduction

Information and communication technology (ICT) refers to the integration of the telecommunications, such as wireless signals and telephone lines, for communication purposes (Tondeur, Braak, & Valcke, 2007). ICT also involves the integration of computers, Internet-enabled gadgets, middleware storage, enterprise software, and audio-visual systems into units that are capable of accessing, storing, transmitting, and manipulating information. Consequently, ICT plays a critical role in communication processes throughout the world (Abdul Razzak, 2013).

The History of ICT Implementation in Schools

OurICT, a website that partners with Microsoft to provide information on technology, records that the use of technology in education began in the mid-1600s when scholars introduced the pencil and the modern library. Close to three centuries later, schools integrated the first computers in the late 1970s (OurICT, 2015). By the time that International Business Machines (IBM) produced the first computer in the 1980s, 20% of US and UK schools were using computers in their learning activities (Munro, 2000). That number rose to 50% in 2005, with public schools making use of laptops and including technology costs in their budgets. Also, during this time, more than 90% of schools provided Internet access (White, 2008). In 2011, most schools in the Western world were making use of tablet PCs for teachers and students, which necessitated the devices' inclusion in education budgets. Today, technology use in

classrooms is something people expect, and most students cannot imagine learning without it (Adesote & Fatoki, 2013).

Albugami and Ahmed (2015) observes that, throughout the years, countries have viewed ICT as the doorway to improving quality standards in education. Two examples are Australia, that spends AUD $8 billion annually, and the United States of America, that invests $10 billion every year to maintain and improve education technology in its public schools. The reason that many states feel the need to incorporate the use of ICT is its increasing accessibility, and the developments that are making it useful in almost all areas of life (Albugami & Ahmed, 2015). Campbell and Jane (2010) report that developing countries like India are using ICT to continuously restructure their education systems. The educational systems aim to prepare students as active citizens and participants of community life. One of the gaols of ICT in education is to adopt technologies that help in making their graduates well-rounded enough in their skills to be relevant in the global arena. In addition, Uganda is using technological tools as the enablers and drivers that boost the economy and education of that country (Alenezi, 2015).

The Role of ICT in Saudi Arabia

The crucial role played by ICT in society today has led to it occupying a prominent position in the educational curriculum. As such, there are many different aspects of ICT currently taught in educational institutions, including public schools. Access to ICT education in public schools is crucial due to the role ICT plays in the Saudi Arabian economy**,** including encouraging cutting edge innovation and creating economic opportunities (Almalki & Williams, 2012) Technology is critical in every field; for example, new technology has allowed the business sector to minimize the time involved in transactions, while separate technologies play an

important role in controlling traffic and make up significant portions of modern vehicles

(Wilson, 2011). While technology is currently used in schools in Saudi Arabia, there is a

disparity in terms of accessibility and resources across schools, which has led to differences in

the performances of students in the public school system (Alenezi, 2015).

Technology and Young Children

In the twenty-first century, technology has become the most powerful method of

communication, sourcing information faster and providing updates almost instantaneously.

Technology is an integral learning tool for boosting the social, linguistic, and cognitive

improvement of young children (White, 2008). Hsin, Li and Tasi (2014) indicated that when

children access computers at home, performance in reading and mathematics, as well as their

problem-solving skills and cognitive development increase. When ICT is used correctly, they can

create real and interesting atmosphere for children to develop their language skills and

vocabulary. Technology offers children numerous of resources that they can use to create their

own knowledge (Stright, Dopkins, & Yeo, 2014). Moreover, the variety of technology tools can

promote children's interaction and collaboration with peers. For instance, video games, which

are designed for more than one player to play, motivate children to communicate with each other

in order to successfully complete the game. In addition, the technology tools used at home for

parents to interact with their children. These interactions may strengthen the overall relationships

between family members. Studies claim that young children who work and play with parents to

accomplish the goal of an activity develop strong relationships (Hsin, Li, & Tsai, 2014).

The importance of using technology is that it helps young people to use their logical

thinking skills. By providing ICT, students can be engaged in completing meaningful projects

while using their critical thinking and problem-solving skills (Baytak & Tarman, 2011).

Research shows that visual media provides a clear picture of what students really know, and they

will process information better. In fact, students spend their time on visual media more than they

do on print literacy; as a result, it is common for students to use their IPads, computers, and

laptops to read and write (Stright, Dopkins, & Yeo, 2014).

Technology has changed the society: children are largely computer literate and, unlike

their parents, they are growing up surrounded by technology and are used to rapid technological

advancements. They can use computers at a young age. School is a significant environment in

which students are involved in a vast range of computer activities (Wilson, 2011). Children in

schools are not only aware of the operation of the computers, they are also aware of the software

they are using. Children are often able to demonstrate computer skills in some capacity,

including awareness of computer basics and names for basic computer hardware. Computers

allow children to play with the keyboards, and thereby identify keys such as letters, numbers,

space, and backspace (Shan, 2013).

Technology is changing, however, and children are using new tools. Many parents are

involving their children with using other electronic devices. Children can use many different

tools even before attending school. For instance, many children are using tablets to read online

books, play games, and watch movies, so they are becoming familiar with using tablets before

beginning school (Abdul Razzak, 2013). Additionally, modern technology can make the learning

process more enjoyable for students (Alharbi, 2012). ICT effects students' engagement when

learning. When technology is used for learning purposes, motivation and engagement is

heightened. This might lead to the promotion of learners' accomplishing tasks (Baytak &

Tarman, 2011).

Technology can help to make learning more interesting. It equips the learner with numerous tools that allow them to assess, evaluate, and present information while sing different media tools that are enjoyable and challenging. Some instructors use and model diverse ways of ICT tools; they effectively involve their students and make an encouraging and motivating learning environment. Costley (2014) indicated that ICT reinforces e-learning by rising stimulation, engagement, social interaction, and by providing positive feedback. Children become more aware of modern technology during preschool, where they have access to technology as a learning tool (Kamal, 2012).

The Use of Technology

There are many uses for technology in the educational sector. Technology can be used to aid in teaching, as well as allow students to access learning materials online and find their own information independently (Tondeur, Van Braak, & Valcke, 2007). The Ministry of Education of Saudi Arabia uses technology to disseminate relevant information to various schools: for example, students' exam results are being posted on the websites, minimizing the time involved in distributing valuable information (Alanazy, 2011). The use of new technology has made lesson planning easier for teachers, allowing them to access a variety of presentation tools, such as PowToon Studio, Prezi, and data projectors.

Technology also can allow for diverse forms of communication, including emails, text-based chats, and phone calls (Alajmi, 2015). This level of comfort with technology enables students to improve their performance and access a wide variety of information online (Tondeur, Braak, & Valcke, 2007). The Internet has been the most transformative technology over time: it has changed the way we do business, the media,

the entertainment industry, and society as a whole (Shan, 2013). The use of technology in

education will help improve the overall performance of students. The students will be able to

access useful information online and will be better prepared for future job opportunities requiring

computer skills (Alresheed, Lask, & Raiker, 2015). The Ministry of Education of Saudi Arabia

has emphasised understanding technology as a crucial part of preparing students for the job

market (Alenezi, 2015).

ICT integration has been used to transform education in many ways; the Ministry of

Education currently uses ICT to maintain records and information concerning every student in

the school system. They also use them to track the progress made by schools in their learning

where they ensure that teachers meet the requirements demanded by the Ministry (Alajmi, 2015).

Technology in education has changed dramatically during the last decade. Developed

countries have incorporated modern ICT in schools; however, Saudi Arabia has not made much

progress in using new technology in public schools. The limited use of ICT has become a major

problem in the Saudi educational system (Almannie, 2015). The Ministry has made some efforts

to enhance learning by integrating technology into the classroom. Effective strategies are crucial

to develop the utilization of ICT in the public schools efficiently (Alresheed, Leask, & Raiker,

2015).

Because of the importance of this issue, current research has identified the barriers to

technology in Saudi schools. Some obstacles, which prevent effective ICT implementation in

schools, still prevail.

The Ministry has had limited success in implementing ICT, mainly because Saudi Arabian public

schools have no suitable technological infrastructures, unlike developed countries (Almannie,

2015). Additionally, there is a shortage of officials within the Ministry to provide supervision

and support regarding this issue. Finally, the Ministry has not provided sufficient courses on

using ICT. These issues are the main causes for the lack of ICT implementation (Albugami &

Ahmed, 2015).

The absence of ICT as a teaching resource has negatively impacted many teachers in

public schools. They hold the Ministry responsible for not providing enough technology in

education (Almalki & Williams, 2012). Teachers want to be involved with technology to

diversify their teaching methods (Abdul-Qadir & Hussain, 2013). Likewise, school principals are

aware of communication barriers with the Ministry (Al-Madani & Allaafiajiy, 2014). Kamal

(2012) states that principals often time suffer from lack of online communication with the

Ministry. In schools administrators require the support of the Ministry regarding ICT tools and

their maintenance services (Alresheed, Leask, & Raiker, 2015).

Problem Statement

Public schools and teachers alike face a challenge due to the lack of ICT implementation

in classrooms (Alwani & Soomro, 2010). This study explores why there is a deficiency in the

implementation of new technology in the Saudi Arabian public education system. Why has the

Ministry of Education failed to implement modern ICT despite encouraging and investing in the

use of technology in schools previously? What factors influence the relationship between school

principals and the Ministry regarding the implementation of ICT? This study addresses a

shortage of research in the field of ICT implementation in education; specifically, this research

addresses the situation in Saudi Arabian public schools.

Significance of the Study

The study helps to show disparities that exist in the education system and the need for the

government to introduce ICT in all public schools. The challenges posed by a lack of ICT integration in public schools are not fully understood due to a lack of prior research on the topic (Albugam & Ahmed, 2015). By studying and conducting interviews with affected individuals, it is possible to identify the steps the Ministry of Education has already taken and what needs to be done to fully realise their goals.

This study contributes to a better understanding of the role technology plays in public schools, as well as identifies areas where government needs to improve education in public schools. The study focuses mostly on the integration of ICT in the learning sector, the use of technology in communication, and the positive influence that the integration of ICT has had on public schools.

Research Objectives

The Ministry of Education has neither enforced nor emphasized the use of modern technology in Saudi Arabian public schools (Alenezi, 2015). This research explores why there is such a lack of emphasis. The study identifies factors influencing the lack of technology implementation in public schools. The research also examines the ICT department of the Ministry of Education, as well as numerous schools that have adopted and currently use the latest technology. Teachers experience many challenges in Saudi Arabian public schools largely due to insufficient access to appropriate teaching tools and an increase in student enrolment without a proportional increase in teaching staff (Albugami & Ahmed, 2015).

The government has not been able to provide modern learning tools to all public schools, despite the fact that such tools are significant to improving education (Alenezi, 2015). The study discusses the challenges faced by public schools in adopting modern technology and the manner

in which technology has improved learning. Moreover, this study assesses the relationship between public school principals and the Ministry. The Ministry particularly directs principals regarding their administrative positions, as well as teachers who are used to receiving orders from the Ministry (Kamal, 2012).

This study involves various players in the education field, all of whom play an integral part in making the use of new technology possible in all public schools. Lastly, this study evaluates the ability of the Ministry of Education to reach the schools in the interior part of the country, where the infrastructure is still a challenge (Alresheed, Leask, & Raiker, 2015). This research is crucial because researchers have not yet sufficiently explored this area. The study is a combination of relevant literature review from Saudi studies and different countries. Most research of Saudis was small scale and most these researches had concentrated on ICT influences on a certain subject and area.

Chapter Two: Literature Review

Present-day life and education have changed rapidly. People need to be technologically literate in the twenty-first century due to the prevalence of technology in every aspect of daily life. Technology has been introduced in homes, educational systems, and workplaces, so students require some knowledge and skills to be engaged in their communities. Students are having new experiences in schools, and these experiences should be adjusted to adapt to the changes in the world around them (Geeslin & Long, 2014). There are several rationales for using ICT in schools. Learning about ICT skills and devices reflects the utilization of technology worldwide. Furthermore, learning is enhanced and broadened when ICT is used. The level of students' confidence in employing ICT in everyday applications increases (Baqutayan, 2011).

The goal of public education is to prepare pupils to be involved, active citizens. Internet growth boosts civic engagement that, in turn, facilitates democratic functions (Shan, 2013). One of the purposes of public education is to teach students more than what is available in textbooks. Public education aims to achieve students' understanding of the importance of being involved in not only educational purposes, but in overall life involvement. Students need to be able to build a sense of community in the environment and the country they reside in. It is important for youth to get involved and understand what is going on politically in their community. However, the average youth does not spend time reading newspapers or watching the news. Nowadays, the today's generation is mostly involved with the Internet and social media. Many Internet supporters believe that social media and the Internet in general will allow many people to contribute in democracy (Myoung & Perry, 2008).

Democracy works well when nations structure networks of trust and social interaction. Civic engagement enables people to see their lives as intertwined with others. Some reformers and leaders have been looking for ways to improve students' skills and communication both inside and outside schools. In addition, they have been looking for ways to teach students about the government, its policies, how it works, and how they can work with other people on solutions to society's problems (Kahne & Sporte, 2008).

Evans and Reynolds (2004) distinguish among three types of citizenship skills that schools help to instill in children. *Informed citizenship* invites political participation, and students can demonstrate this through their comprehension of democracy and its dimensions. *Purposeful citizenship* encourages learners to reflect on their individual senses of moral reasoning, legal responsibility, and civic identity. *Active citizenship* promotes literacy skills such as creative and critical skills, collaboration, conflict resolution, and inquiry strategies. Maylor and Read (2007) found in their research that teaching various subjects in school encourages students to understand the diversity that exists among them regarding personal abilities and creativity. Also, since public schools involve the participation of students from various social, religious, and ethnic backgrounds, students have an environment where they can form their identities based on their experiences with their teachers and friends. Based on these differences, teachers have a great opportunity to teach children (through formal and informal activities) that there is a need for social cohesion created through shared values. Evans and Reynolds (2004) stated that learners take on the ability to respect the views of their schoolmates and hold on to their identities as a way of keeping the peace. With the environment that public schools provide, students with adequate training can come out of school knowing how to be democratic and good citizens, as part of a larger community.

Given the prevalence of technology in all areas of industry, students need to be equipped with computer knowledge to prepare them for entering the workforce (Tan, 2008). Incorporating technology into learning enhances the quality of instruction and provides a chance for teachers to continuously assess the progress of the students. According to the University of Texas located in Austin, "New technologies are enhancing our understanding of how students learn and providing instructors the ability to customize course materials and create personalized learning experiences tailored to students' individual needs" (p. 3). Technology empowers instructors and students to transfer teaching and learning processes from a teacher-centered to a learner-centered approach. This learning process will result in a rise of learning gains for the learners, and it will allow opportunities for students to improve their creativity, critical analysis and reasoning skills, problem-solving, and social skills (Costley, 2014).

ICT can be used as a tool in order to allow teachers the ability to provide and receive feedback frequently throughout the teaching process. They are able to provide assignments and marking at any time during the day without having to be forced to accommodate throughout the school hours. There are several tools and programs that help teachers creatively assess their students. Some of these programs include creating an online digital portfolio, creating or adding to a Wiki, and collaborating on Blackboard, as well as providing series questions, which are designed to test deep understanding (Pacific Policy Research Center, 2010). Moreover, the incorporation of technology across the entire curriculum would allow students more advanced learning opportunities in all subjects (Alharbi, 2012). Those who develop curriculum should also be more involved in the implementation of technology in the classroom. The integration of technology should serve to guide, expand, and enhance learning objectives (Abdul-Qadir &

Hussain, 2013). This bridging between curriculum and technology will allow students to better understand technological advancement at a younger age (Khosrow-Pour, 2013).

Digital Divide in Saudi Arabia

The *digital divide* refers to the difference in access to, and usage of, ICT between people, groups or countries (Tan, 2008). While the Internet is the most powerful tool in the world, Saudi Arabia was quite late in accessing it. The reason of that refers to the Saudi culture and conservative nature of the Saudi government. The main problems that caused the digital divide in the past were difficulty of access to the Internet among the Saudi people, and their lack of knowledge of how to use the Internet (Warschaue, 2011). Today, the culture and people are more open than before; the majority of people in Saudi Arabia now access the Internet (Ragnedda & Muschert, 2013).

Saudi Arabia has one of the largest populations of Internet users in the Arab world. The number of Internet users in 2016 is approximately 22.3 million (70.4%) (KSA ICT Indicators, 2016). However, there is a digital divide in the society between those who have access to the Internet and those who do not. Families living in poverty have little or no access to technological resources in the society (Ragnedda & Muschert, 2013). The Ministry of Education has attempted to close this gap by introducing the use of the technology in all schools to help in communication and aid in learning (Alajmi, 2015). In Tan's view (2008), the gap in ICT integration between public and private schools should be narrowed. Children who come from poorer backgrounds have been able to pursue computer courses thanks to the introduction of ICT in the public schools, something that was not previously possible (Warschaue, 2011).

The Ministry of Education

The education system in the Kingdom of Saudi Arabia is comprised of two main categories: the Ministry of Education and the Ministry of Higher Education (Oyaid, 2009). In 1975, the Ministry of Higher Education was established and placed in charge of all aspects of higher education learning in Saudi Arabia. However, in 2015, the Ministry of Education and the Ministry of Higher Education merged, and became one entity under the name *Ministry of Education*, located in Riyadh, the capital city (Ministry of Education, 2016).

The Ministry of Education in Saudi Arabia was established in 1953. The Ministry is a centralised body that oversees the running of all schools in the country (primary, intermediate, and secondary). There are forty-two educational directorates located around the country; those directorates fall under the supervisory responsibility of the Ministry of Education (Oyaid, 2009). After the Ministry of Education and the Ministry of Higher Education are combined, the Ministry of Education became responsible for education of all levels. The Ministry is responsible for managing the country's educational system, controlling all educational policies, and supervising the entire education system within its jurisdiction (Ministry of Education, 2016). The Ministry is responsible for all subdivisions of the education sectors, including public and private schools, special education, and adult education and literacy. It is also responsible for maintaining public school buildings and supplying schools with educational materials, hiring instructors and paying their salaries, equipment, and other required facilities. The curriculum and textbooks are uniform in Saudi Arabia (Kamal, 2012).

History of Education in Saudi Arabia

Prior to the nineteenth century, the Saudi Arabian education system was traditional. Education was limited to Hijaz and Najd provinces, and it consisted primarily of seminars in mosques ranging from five to six years. Modern education first began in the nineteenth century in the provinces of Hijaz and Al-Ahsa (Gitsaki, 2011). Since the establishment of the Kingdom in 1932, education was reserved for only boys, particularly boys from the wealthy families. By 1950, there were 226 schools for boys. In 1960, the central administration for girls' education was formed in a bid to provide education for all. In 1960, 22% of boys and 2% of girls were enrolled (Hussain & Abdul-Qadir, 2013). After a few years, public perceptions of the importance of education for girls changed radically. During the 1980s, the education system underwent its greatest period of growth, wherein many improvements were made. In 1981, 81% of boys were enrolled in schools while 43% of girls were enrolled. By 1989, Saudi Arabia had more than 14,000 educational institutions (Al-Abdulkareem, 2009). Additionally, the computers introduced in the 1980s made significant changes to the handling of information, as they were capable of storing large amounts of information quickly.

Education System in Saudi Arabia

The International Bureau of Education states that the overall goals of the Kingdom of Saudi Arabia for education are (1) to ensure students have a comprehensive understanding of Islam; (2) to instill and extend the Islamic creed; (3) to give students the ideals, teachings, and values of Islam; (4) to provide them with different skills and knowledge; (5) to direct their behaviour in constructive directions;

(6) to culturally and economically develop the society; and (7) to prepare individuals to be beneficial citizens in building the society (Albugami & Ahmed, 2015; US-Saudi Arabian Business Council, 2011). Apart from the private international schools, the law requires that the education system in Saudi Arabia be fully single-sex except in kindergarten. In addition, the law requires that all teachers and their students to be of the same gender. These single-sex schools are well organized, providing the necessary facilities required by each gender. This organization is attributed to the high Islamic values held by the government of Saudi Arabia.

Education in Saudi Arabia is compulsory; all students attend schools between the ages of six and fifteen (Simsim, 2011). The general education is divided into four stages: two years in kindergarten, six years of primary education, three years of intermediate stage, and then three years of secondary school. All textbooks, instruction, and health services to students are provided at no charge by the government (Oyaid, 2009). At the elementary stage, comprehensive assessments are applied, where students are evaluated on their performance and acquisition of skills specified for each subject. At the secondary stage, all first-year students follow the same curriculum. In the second year, students can choose between either art or science programs, as well as courses preparing pupils for university. The school year is divided into two semesters of 18 weeks each. The first 16 weeks are for instruction, and the last two weeks are devoted to final exams (Bacherman, 2009).

The curriculum department is placed in the Ministry, and is unified in Saudi Arabia. The department is in charge of developing school curricula and planning textbook subjects. After the attacks of September 11, 2001, Saudi Arabia's government made some major changes in the school curricula, asserting that Islam is a religion of peace (Hilal & Denman, 2013).

Baqutayan (2011) observes that the education system in Saudi Arabia adopts many features from a curriculum that is Wahhabi-controlled. He believes that, with such an intense religious outlook, the methods of instruction will still be geared toward subject memorization and theoretical studies. As long as teachers use the old textbooks and syllabi, they will not be able to introduce the practical execution of technology and science in class (Alsahli, 2012).

An important step in integrating ICT into the curriculum is training teachers in how to effectively use technology in their classrooms. Baqutayan (2011) proposes that reforms of the Saudi education sector must consider the professional development of teachers, and ensure that they receive proper training on using updated practices in class. Otherwise, teachers who recognize that change is necessary will not possess the proper ICT skills to sustain them in their everyday activities.

There are various factors affecting students' learning in Saudi Arabian schools. For example, socioeconomic status, differences in teaching methods, and geographic location can all significantly impact a student's performance (Tudor, 2013). Parents who have a low socioeconomic states (SES) are mostly concerned with meeting basic needs for their children and not on education needs. Educated parents with higher levels of education are more concerned about their children's academic performance and accomplishments than parents of lower SES, who often have not completed secondary school (Alnuaim, 2013). School performance is related to teachers' qualifications and geographic locations; as a result, rural schools have overall lower school performance and achievement (Tudor, 2013). Similarly, the successful integration of ICT in Saudi Arabian schools varies from location to location. For example, schools in large cities are more likely to use ICT than schools in small towns (Alresheed, Lask, & Raiker, 2015).

Not all teachers can apply appropriate and effective teaching methods that align with learning outcomes. Some teachers are still applying a teacher-centered method to transmit knowledge to their students rather than a student-centered method. Many researchers have indicated that quality of teaching and the use of diverse teaching methods are often reflected in the success of students (Baytak, Tarman, & Ayas). Technology can help teachers to be diversified in teaching. For example, when students are collaborating and working in groups, they share their experiences with one another through online discussions, blogs, and other social media tools of social media (McKnight, O'Malley, Ruzic, Horsley, Franey & Bassett, n.d).

Educational Policy of Saudi Arabia

Educational objectives for any country reflect its national beliefs and cultural values. The main aims of the education policy of Saudi Arabia are the beliefs in the one God, in Islam as the way of life, and in Mohammed as God's Messenger. Muslims are influenced by the Islamic religion (Oyaid, 2009). Islam encourages Muslims to learn and obtain knowledge as is mentioned in the Holy Quran: "Allah will exalt those who believe among you, and those who have knowledge, to high ranks. Allah is informed of what ye do" (Al-Mujadila 11:22). Saudi culture is mainly determined by the Islamic creed. In fact, all phases of cultural, education system, and society lifestyle are concentrated on the Islamic religion, which is the base of the society's values, creed, and manners. To understand the range of the impact of Islam on Saudi citizens, people need to understand the Saudi Arabian history, economy, policy, and development of society (Alsaleh, 2007).

General Policies. According to Oyaid (2009), "Educational policy is the constitutional articles of Education which explain the general principles that planning is based on, and state the

aims and objectives of the educational process" (p. 52). She clarifies that to understand the educational policy in Saudi Arabia, people should understand its roots, basis, and goals.

There are two kinds of policy in Saudi education: Ministry policy and school policy. Policies at the school level are made by principals for a specific school whose current condition, employees' insights, and students' needs are known and taken into consideration. However, the Ministry policies manage the general instructions that all schools should rely upon in their interior policies (Kamal, 2012). Principals are directed to follow the government rules regarding education. For that reason, there is enhanced communication between principals and the Ministry, which is helpful because any school policymakers need to get approval from the latter before teachers can, for example, change something in the curriculum or use additional material (Alanazy, 2011). Oyaid (2009) mentions in her study that schools are affected by the Ministry policies and have difficulties applying them. Teachers in her study are more familiar with schools' policies than those of the Ministry, and have a positive feeling about them because they are explained clearly. She states that the Ministry policies are not clear enough for some teachers and principals. She concludes that some instructors have low levels of awareness regarding the policies; those teachers are following the rules and achieving the objectives of those policies without having complete knowledge of them.

Simsim (2011) declares that the Ministry should enforce its policies in all schools and have a clear vision about formulating those policies in order for schools to implement them in the right way. He claims that providing ICT in schools is not enough, and the Ministry must cope with the obstacles that reduced ICT use by offering guidance, instruction, and supervision to schools to ensure their policies are applied. In addition, the Ministry need to provide training programs on ICT application for both students and teachers. School and education authorities are not capable

of producing new policies or financing projects without obtaining approval from the Ministry. They also use them to track the progress made by schools in their learning by ensuring that teachers meet the requirements demanded by the Ministry (Abdul-Qadir & Hussain, 2013).

ICT Policy and Implementation in Saudi Education. Saudi Arabia has a relatively short experience with ICT. The quest to implement technological learning in Saudi Arabia came from the concern that the country was depending on the vast numbers of noncitizens to fill administrative and technical positions (Simsim, 2011). The government began the Tatweer for Education Corporation so that the state could develop new subjects for curriculum reform in the education sector, so the curriculum would be more relevant to meeting the needs of the kingdom. It is the reason some tutors and policy makers want to structure the education goals so that they would cater to the provision of a workforce that meets the needs of the country (Albugami & Ahmed, 2015). In addition, ICT was introduced into education after Saudi policy makers requested improvement in education to catch up with developed countries. As a result, ICT policies of Saudi Arabia "were borrowed from those developed countries without conducting their own locally based research which would have assisted them in the initial phase of ICT introduction" (Oyaid, 2009, p. 31). Further studies have established that, in spite of the fact that there is ICT educational policy in the country, it is not well-applied, connected, and reinforced; additionally, its application is inactive at the schoolroom level (Alenezi, 2015).

ICT educational policy is produced by multiple organizations under the Ministry responsible, including the Board of Educational Inspection, the Department of Computer and Information Centre, the Department of Curriculum Development, and the Department of Educational Planning (Almannie, 2105). These organizations work separately, and they do not

collaborate. Each one strives to regulate problems regarding ICT in education. The deficiency of collaboration and coordination between these organizations has caused inconsistencies in policies (Oyaid, 2009).

Budget for ICT in Saudi Arabian Education System

The main revenue in Saudi Arabia largely depends on oil production. As a result, the government has aimed to vary the Saudi Arabian income sources and compete in the global economy (Hilal & Denman, 2013). Because of the increased government income in the past decade, general education in Saudi Arabia has improved, and the government has established several educational reforms (Alresheed, Lask, & Raiker, 2015). "The upward trend of budgetary allocations highlights the Saudi Government's conviction that education is the cornerstone of sustained economic development, as it enhances human capital and knowledge, both essential ingredients for economic growth and social cohesion" (US-Saudi Arabian Business Council, 2011, p. 3). In 2015, the education sector accounted for the highest government expenditures in the country. The Saudi government dedicated the equivalent of 25% of its overall budget towards improving educational facilities and for the implementation of ICT in the school curriculum (Alresheed, Lask, & Raiker, 2015).

The Saudi Arabian government has made a commitment to the technological field, spending billions of dollars in enhancing the education sector through the incorporation of contemporary technologies. Also, the Kingdom revised the education curriculum, to facilitate the use of electronic tools that help to advance the teaching process in schools, both private and public (Delong-Bas, 2013). Additionally, the scheme led to a commencement of training

activities directed towards educators, so that they could establish adequate employment of ICT in learning institutions (US-Saudi Arabian Business Council, 2011).

The Saudi government has been spending large amounts of money of the development of ICT in public schools. In 2007, the government invested $3 billion to integrate ICT into education (Oyaid, 2010). In 2015, more than £36 billion was allocated to the educational sector (Ahmed & Albugami, 2015). In spite of these substantial investments and continued support from the government, Saudi still lags behind developed countries regarding ICT integration (Kamal, 2012). According to Ahmed and Albugami **(**2015), "unfortunately although the Saudi Arabian government has lots of funding, there is no clear strategic framework towards equipping ICT in schools" (p. 37).

In addition to the government's efforts in improving education in the country, 125,000 students have been conferred overseas scholarships annually by the government, from 2005 to 2015 (Ahmed & Albugami, 2015). In 2005, the King Abdullah Scholarship Program was launched by the Ministry of Education and supported by the government. The objective of this program is to academically sponsor Saudi Arabian citizens who wish to pursue degree programs in diverse areas of specialization. More than 200,000 students have been granted degrees in over 30 countries (Hilal & Denman, 2013). In 2015, the government of Saudi Arabia stated that it had allocated around USD $6 billion to the program (Ahmed & Albugami, 2015).

The Educational Ten Years Plan (2004-2014)

The project was established in 2004, and its objective was to develop the curriculum and apply ICT to be part of the curricula by placing pupils at the center. The project focused on incorporation of 55 modern ICT in the school syllabus that would reinforce the development of a

learner's personality to make him proud to be Muslim and loyal to the Kingdom in conduct and practice (Oyaid, 2009). The curriculum has been updated in recent years, and now requires students to produce documents using PowerPoint, Excel, and Publisher (Kamal, 2012).

King Abdullah bin Abdulaziz Education Development Project (Tatweer)

The Project started in 2007 and was intended to develop and improve education standards in Saudi Arabia. The areas targeted included curriculum, the education system, supporting ICT integration, and teachers' skills (Alenezi, 2015). According to Kamal (2012), "Tatweer is an Arabic term, which refers to reformation. Considering the weaknesses of the previous reform programs, Tatweer comes up with new and unique concepts, aiming to achieve a comprehensive and a wholesome educational transformation in the education" (p. 24).

The program has sought to establish an active learning system for students to acquire a better education and be successful. The learning process is expected to improve once the teachers have acquired the appropriate professional training. The learning system will need to shift to a learner-centred system, with the supervision of the teachers critical in maintaining the system (Alenezi, 2015). Through this program, students should be able to efficiently access and utilize technology. The use of technology also improves critical thinking and engagement in the learning process (Baqutayan, 2011).

The Benefits of Integrating ICT in Education

The benefit of implementing ICT in teaching is that the learning process has changed from old-fashioned lecturing, which is teacher-centered, to learning that is student-centered. Instructors specify educational goals to help students have their own learning experiences, and to shape and enhance their learning experiences (Adesote & Fatoki, 2013). One of the primary

objectives of implementing ICT in public schools is to improve the academic performance of the students and make the education system more efficient. Tools like tablets, mobile devices, and interactive digital whiteboards are proving to be valuable learning and teaching resources because they actively engage students in the learning process**.** The tools that make it possible to use technology in education are going a long way in helping students develop their problem-solving capabilities (Alharbi, 2012). They offer learners more exposure to the outside world, and facilitate their interactions with individuals from various cultures, helping them receive better instruction in the English language. Students become collaborative in their study methods since communication is easy and seamless, and they have learning opportunities that are flexible enough to cater to individual needs (Lippman, 2012).

The Internet has shifted from providing people with direct access to information and resources to being an effective network that is able to allow people to connect through different websites, wiki, blogs and social media (Almalki & Williams, 2012). In addition, the Internet helps solve many problems in society by giving educators and students greater access to information (Al Saif, 2005). With the ability to access useful information online, the learning process will teach them to be independent thinkers, and they will be better prepared for future job opportunities that require creativity, teamwork, and computer competence (Adesot & Fatoki, 2013). Search tools on the Internet can help teachers to demonstrate how students can look for relevant information by customising their input words. It trains students to be precise in their thinking by trying to know what they want to achieve from every educational activity. The Internet allows students to access information and knowledge that was previously hard to find (Alharbi, 2012). Furthermore, ICT integration in schools allows students to do their own research

through a variety of subjects using the Internet. Here, students can share knowledge with colleagues from other institutions (Tudor, 2013).

ICT it is a way to improve students' and teachers' critical thinking; digital reading is part of ICT tools, and it plays an important part in learners' literacy development. Reading online can help educators and students to critically evaluate information and synthesize information from several sources. Information technology literacy is basically technology literacy and information literacy (Stright, Dopkins & Yeo, 2014). Technology literacy is using ICT as a tool to collect, locate, and connect information online. However, information literacy is "a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, manage, and use effectively the needed information" (Leung, 2010, p. 287).

The involvement of ICT in learning and teaching is a crucial aspect of improving the education standards of any country (Tondeur, Braak, & Valcke, 2007). ICT integration creates a learning environment that encourages students to improve their performances. It also can help teachers facilitate active learning, increasing the students' motivation (Mndzebele, 2013). Studies suggest that there are a number of positive outcomes when using technology tools, educational gaming, and web-based tools in the classroom. For instance, the promotion of the learners engagement during learning as well as the promotions of motivation in different subjects support a student-centered approach. These tools can help to encourage learners' group work skills, interaction and engagement. "These outcomes indicate that ICT promotes individualization of schoolwork, curiosity, motivation and an interest to deepen the knowledge in the current topic" (Kreutz & Rhodin, 2016, p. 9). Studies conclude that ICT, as a motivational learning tool, has a positive influence on the learning process as it provides a context for the students that is challenging and that stimulates their curiosity. Learners, in turn, show eagerness towards

working with and learning with technology (Baytak, Tarman & Ayas, 2011). ICT integration also can improve collaboration and flexibility in learning; studies have found that a positive correlation exists between ICT integration and students achievement (Tondeur, Braak, & Valcke, 2007).

ICT and Creativity

Creativity is the process of expressing oneself regarding utility and originality. It entails a disposition of the mind, which is engaged, open, and experimental (White, 2008). The evaluative and generative modes that relate to creativity enable children to understand complicated issues by triggering their creative thinking (Campbell & Jane, 2010). When they have a platform that encourages them to make decisions and try to solve problems on their own, students learn more effectively and retain more information. However, instructors have the responsibility of identifying the areas of learning that they need to emphasize in order for their students to understand concepts better (Adesote & Fatoki, 2013). Campbell and Jane (2010) observe that for technology to be effective, teachers have to use it in holistic approaches rather than define it in a way that isolates it from the environmental and social context. This argument insinuates that it is the way that users apply creativity using technology in the classroom. In clear terms, creativity can only change the culture of an institution when it is understandable by others, and they can take part in acting on the same. Alwani and Soomro (2010) suggest that, with technology, people are able to be creative enough both to do *things better* and to do *better things*. The reasoning here is that technology itself is entwined in creativity, since it is a product of creativity. However, if the users of ICT were not ready to make use of the extensive advantages of technology, it would remain a redundant asset in the classroom.

Trying new apps and tools challenges students. Exploring different technology can raise a learner's intuition and help them to think creatively. For example, video games are not just promoting content knowledge but also improving creative and problem solving skills (Al-Ali, Al-Shabatat, Fong, & Andaleeb, 2011). When learners play video games, they are interacting with the game's simulation or virtual reality based on their fictional or actual world. Educational games "include collaborative project-based learning experiences" where learners can design a game and become the content producers. This can help students to become creative thinkers by finding novel ways to overcome challenges and to utilize knowledge in new and effective ways. (Kärkkäinen & Lancrin, 2013).

There are different tools and programs that can enhance creative thinking with the support of ICT Web. For example, Web-based mind-mapping software improves ideas visually, and students are able to share their ideas with others. Moreover, mind mapping software, which is often used for creative exercises, allows for cooperative brainstorming, the management of complex information, and a space to visualize ideas (Groff, 2013). The online version of whiteboard allows more than one student to draw at the same time, and it can be in the same board, hereby stimulating creativity. This collaboration tool provides a reinforced learning experience that is visually appealing. Platforms and social networks such as Facebook, LinkedIn, are means that can be used to form an online network of creativity. "The collaborative aspect of these creative techniques opens the door for…ICT to support the creativity process" (Hagemann, 2012, p. 24). The utilization of ICT tools does not automatically promote learning outcomes or creativity. ICT can support both learning outcomes and learning output, but teachers need to know the best approach to take, when to apply the technology tools, the purpose of applying these tools, and what sort of skills are needed to use these tools effectively (Groff, 2013).

ICT Integration in Saudi Arabia

There are three rational objectives involved in the use of ICT for educational purposes in every country. They are: to support the learning process of children, to improve learner's literacy in technology, and to enhance the organizational productivity of schools. The Saudi Arabian education was completely relying on students memorizing what is taught in class alone (Al-Qurashi, 2008). There was no prerequisite for the learner to question what the teacher has taught or add on to it. The learning situation has changed and become more student-centered. Saudi Arabia prioritizes everything related to education and the use of ICT in education began recently in the country, beginning with the computer (Albrkhil, 2013). In 1980s, the Ministry of Education used computers for a narrow range for administrative functions. The computer was introduced in schools in the 1980s through three subjects in secondary schools which are systems programming, programming in basic, and computer sciences (Alajmi, 2015). Because of the success in these programs, in the early 1990s, computer literacy became a principal subject in all high-school males and later in females schools with two classes each a week in the high school curriculum. The Ministry of Education subsequently equipped public schools with computer laboratories (Al-Qurashi, 2008). Since 1999, high schools have taught: computer science, computer applications, information systems, and the information Age. Several computer-training programs have been provided for instructors and pupils. In recent years, all schools have had at least one computer laboratory (Oyaid, 2009). The Internet was introduced in the 1990s, and its primary purpose was to allow users with access to a vast amount of information in an efficient manner (Abdul-Qadir & Hussain, 2013).

 The rule of teaching computers has been driven by the government educational policy that was including not only equipping schools with hardware and software but also the training of

policy executers. Studies have demonstrated that teachers who have been trained to use ICT are more likely to use ICT in their classroom (Alsaleh, 2007).

Some teachers do not have access to the Internet daily and some use apps or programs according to their interests. Integrating ICT in education calls for the removal of the obstacles that prevent the implementation and use of the technology. The Ministry of Education has the main role of integrating ICT, supported by school principals (Alajmi, 2015).

The ICT integration into the Saudi Arabian education system holds many significant benefits for the country. For students, ICT integration allows for faster and more efficient research (Alfuradi, 2013). Outside of class, students get some time to carry out their own personal studies using the ICT facilities available for their use (Smith & Abouammoh, 2013). The use of computer-based applications involving visualisation, modelling, and simulation has proved to be a powerful teaching tool. Teachers who adopt this method provide students with a better understanding of the subject (Bacherman, 2009). For example, computer-based applications can be used in science classrooms to explain complex concepts. Students attain higher scores and have a greater understanding of the subject material when taught using technological tools (Almaghlouth, 2008).

The Ministry of Education's goal of improving the quality of education in Saudi Arabia could therefore be achieved through the integration of ICT in all schools (Alenezi, 2015). The Ministry has encouraged the use of ICT in the education sector: they have provided adequate IT infrastructure and learning management systems, such as projects, WebCT, Tadarus, and the Arabic Language Learning Management System (Albugami & Ahmed, 2015). The National Center for E-Learning and Distance Learning was established in 2006 to support E-Learning in public schools. The software used is publicly available on both CDs and DVDs. There are

several projects that the Ministry has achieved in implementing ICT; for instance, the Ministry has overseen improvement of libraries in public schools into learning resources centers, which consists of different information sources, including online sources. Additionally, the learning resources centers contain information regarding ICT and how teachers can incorporate it in their teaching (Oyaid, 2009). Another project is computer-based labs; the goal of this project is allowing students to learn through experimenting and observation by using effective software applications linked with computer sensors.

Moreover, a project termed Digital Technical Centers has been introduced "to meet educational needs in the areas of digital content and educational application of ICT. These centers are equipped with a unit for the production of digital interactive educational aids to support school curricula" (Oyaid, 2009, p. 23). The Ministry of Education has established ICT clubs to boost awareness regarding ICT among the teachers, students, and society members, and to provide them training courses and skills within and beyond the schools. These clubs help to minimize the inequalities in accessing computers (Al-Saggaf, 2008). The Jehazi Project is managed by the Ministry to enable instructors to own laptops and tools, including scanners and printers, at a lower price. The aims of the project are to increase ICT knowledge among instructors, and to increase the quantity and quality of teaching by training teachers in ICT use (Kamal, 2012). According to Oyaid, "In 2010, King Abdullah bin Abdulaziz's Public Education Development Project 'Tatweer,' and The Ministry of Education signed a contract with the Microsoft Worldwide program" (2010, p. 28). The contract supported Tatweer and The Ministry of Education's efforts to improve the education system by integrating ICT in learning. ICT training for teachers and principals took place prior to the integration of ICT (Kamal, 2012).

However, ICT integration in Saudi schools is limited because of cultural, political, governmental, and financial practices. Balancing technology use with the foundations of the Islamic religion is one of the major problems. The role of religion in education may have an influence on the acceptance levels of the teachers, and the frequency with which they will use these tools in class. Even with the Ten-Year Strategic Plan that the Ministry runs, in the country (Alenezi, 2015). Prior to education reforms, the hours of religious courses (i.e., Quran, Tafsir, Tajwid, Hadith, Figh, and Tawhid) ranged from 14 to 35 percent. Religious studies teachers are the most sensitive to technology integration in their teaching, often believing that their subjects do not require ICT integration (Albugami & Ahmed, 2015). Additionally, "Educational borrowing from other countries without adaptation may have negative influences on the Saudi educational system" (Alenezi, 2015, p.638). While investment in education has been substantial the current budget is insufficient for implementing technology tools in schools (Delong-Bas, 2013).

Saudi Arabia must strike a balance between cultural traditions, a reluctance to integrate ICT into pedagogical practices, and the adoption of modern technology. Since the country has a long cultural tradition, one that gives teachers limited freedom, the culture needs to become more open and flexible to the outside world (Al-Furaydi, 2013). ICT integration also faces challenges from teachers, principals, and The Ministry of Education.

The Ministry of Education has no clear vision on ICT implementation. Teachers have also been ineffective in learning how to integrate technology in education (Al-Saggaf, 2008). According to Ahmed and Albugami (2015), the director of ICT at the Ministry of Education said, "I admit that there is a shortage within our department to support and supervise ICT use in schools, the reason, as what I said, the lack of sufficient supervisors" (p. 47). The Ministry has

not committed to providing adequate ICT equipment and technical support. There are no CDs and websites on ICT integration recommended by the Ministry of Education in Arabic (Al-Furaydi, 2013). Some Saudi Arabian rented school buildings suffer from lack of infrastructure because these buildings were prepared in advance for housing (Alenezi, 2015). Moreover, there is also limited coordination and collaboration in school settings on ICT usage between principals and the Ministry.

According to Albrkhil (2013), school principals are crucial to the ICT implementation. The outcomes of his research demonstrate that most principals did not provide enough support, motivation, and instruction to teachers. Some principals lacked leadership regarding ICT implementation. Further research has revealed that the educational policy in Saudi Arabia is unclear and poorly communicated, in addition to being impossible to implement (Algamdi & Samarji, 2016). Principals are charged with the responsibility of providing the necessary tools, devices, resources, and Internet, and are instructed to do so by reporting to the Ministry what the school needs (Oyaid, 2010).

Barriers preventing teachers from using technology in classrooms include teachers' beliefs regarding and behaviour towards ICT integration, a general lack of maintenance and technical assistance, poor knowledge of English, and a lack of experience and knowledge regarding ICT (Alajmi, 2015).

Moreover, some teachers prefer traditional teaching methods, and they do not believe in integrating ICT in education. Traditional teaching methods refer to the tactics that instructors use in schools; those tactics are not sufficient enough to impart the knowledge and skills that students need (Almahroos, 2012). Among these methods is rote teaching, a technique that encourages students to memorize what they learn through repetition. Another is instructional

teaching, where the teacher is the centre of the learning process, and the role of the student is to listen and write notes where possible (Lippman, 2012). The major reason behind the slow shift towards better instructional methods is that teachers are having a hard time unlearning the old ways, so that they can acquire and utilize the new ones. Outside criticism has also been directed toward these outdated styles, causing some instructors to have difficulty in redirecting their efforts (Almannie, 2015).

The prevalence of religious studies in Saudi Arabian schools supports one of the traditional teaching methods used by not only the teachers, but also the curriculum developers (Almahroos, 2012). One of the traditional methods of learning that teachers still use in schools is memorization. Baqutayan (2011) states that teachers are still encouraging students to memorize large sections of the Qur'an, and the system extends even to the curriculum designed for students in the University. When it comes to technology, teachers get so accustomed to these front-of-class didactic methods that they are afraid to change and use different student-centred tools. Alwani and Soomro (2010) found out in one of their studies that some teachers harbour the fear of looking stupid when they use technology, and they cannot tolerate when applications fail, or devices stop working in the middle of a classroom session, and as a result the teacher cannot continue. This is an indication that the training of teachers concerning ICT has not been thorough enough to ensure seamless implementation in school. The traditional model of teaching relied on the short-term recall of facts, whereas ICT integration provides the opportunity for greater retention and a deeper understanding of facts and concepts (Alwani & Soomro, 2010).

Previous studies show that the quality of education still needs to undergo improvements since the incorporation of technology into the Saudi Arabian education system (Almalki & Williams, 2012; Geeslin & Long, 2014; Robertson & Al-Zahrani, 2012). The conclusion comes

from a scrutiny of the measurable benefits that the country is achieving from the expenditures it

is making on technological education. The Ministry of Education published in a report that there

was a tendency for teachers to delay the completion of planned courses allocated to them by the

Ministry. The Ministry stressed that such behaviour will, in the long run, contribute to

impairment of the general goals of the curricular material; also, it will affect the cognitive

achievement levels of students. This research explores the current integration of ICT in Saudi

Arabia and sees if there have been improvements. This study also identifies the main reason why

ICT implementation is limited and identifies possible solutions.

The Challenges Created by Technology

As identified earlier, Saudi Arabia still engages in intense religious studies, even at the

university level. For that reason, teachers who support the continuation of religious studies will

oppose the type of exposure provided by ICT tools like the Internet, and will resist the

improvement of communication which, in turn, increases the points of contact between men and

women. These instructors will, therefore, offer little support to students who are using

technology (Baqutayan, 2011).

Technology frustrates individuals who have no idea how to use it. Since there is currently

inadequate technological training of teachers, they have limited knowledge on how to apply

technological tools in the classroom. When they use it, it is with reluctance, uncertainty, and lack

of appropriate preparation (Almannie, 2015). Moreover, using technology in the classroom,

especially the use of the Internet, can be distracting for the students. At times, using mobile

devices and tablets can interfere with the learner's concentration instead of engaging them. Thus,

it is prudent for teachers to structure their teaching to avoid such situations (Alwani & Soomro,

2010). Awan (2012) has found that when students use their phones or tablets during lectures, they switch from staying on task to watching videos, texting, checking email or Facebook. In his study he stated that 80% of pupils notified that they oftentimes switch between studying and ICT devices.

Countries with similar situation in the Middle East

There are other countries in the Middle East that have issues adequately addressing disparities in the integration of ICT across public schools. These countries, including Jordan, Bahrain, and Kuwait, have also recently started embracing the use of technology in the education system (Gitsaki, 2011). While they have managed to integrate ICT in the public schools, they face many of the same challenges as Saudi Arabia in ensuring equitable access to ICT. Alkawaldeh and Menchaca's (2014) study identified some barriers to the integration of ICT in Jordan public schools, including insufficient experience of teachers using the technology, a lack of confidence in ICT, and a lack of equipment. Teachers have also been using the same traditional teaching methods for years, making it difficult for them to change and adopt a more modern approach including ICT. The Ministry of Education of Jordan does not currently have sufficient funding for total ICT integration.

Abdul Razzak (2013) concluded in her study that some schools in Bahrain are not sufficiently equipped with the tools required to integrate ICT. The main barriers to ICT integration in Bahrain are a general lack of technical skills, poor Internet speed, and inadequate training. In Kuwait's schools, schools have access to a sufficient number of computers; however, access to educational software is limited. Additionally, there is a lack of auxiliary ICT

equipment, training on technology integration, and knowledge of using ICT in public schools in

Kuwait (Alharbi, 2012).

Chapter Three: Research Method

This study makes use of the qualitative method of data collection and data analysis to determine what individuals (e.g., superintendents, policy makers, and school principals) think about their current education system and the changes that ICT promises to bring into the process. The process is more personal than quantitative research because, as Seidman (2015) puts it, qualitative methods give a glimpse into the most complex educational and social issues that people experience. The objectives of qualitative research "are generally directed at providing an in-depth and interpreted understanding of the social world, by learning about people's social and material circumstances, their experiences, perspectives and histories" (Brikci & Green, 2007, p. 32). It allows researchers to gain a deeper understanding of issues, and it provides responses to questions that the researcher was not planning on asking participants (Brikci & Green 2007). Qualitative research methods gather data on the personal beliefs of people to understand how they perceive issues, and most probably why they hold their opinions. From such information, a researcher can gather details about improvement as suggested by the participants in the research study (Dixon-Woods, 2011). According to Ritchie & Lewis (2003):

> A key distinction is made between naturally occurring and generated data. The main methods involved in working with naturally occurring data are observation, documentary analysis, conversation analysis and discourse analysis; the main types of generated data in qualitative research are in-depth interviews and group discussions. Naturally occurring data may not provide a sufficiently full picture of the research

topic, Generated data collection methods allow participants to describe the personal or organizational contexts in which the research issue is located and how they relate to it.

This method is relevant for this study because it seeks the reactions of affected parties towards the use of ICT in education and learning. It will dig deeply into their views and determine the perceptions that have formed about the prevalence of outside influences in the traditional system of education in Saudi Arabia. With the results of these data collection procedures, the study uses content analysis to isolate the main ideas and themes by making inferences from the information to other properties or states of its source (Ritchie & Lewis, 2003). This defined process follows step-by-step rules and models.

Research Questions

The research questions help the researcher to focus the study and to understand the phenomena of the issue. After choosing the topic of the research, the researcher has listed multiple questions related to the topic. Then, the researcher has chosen the best questions to achieve the purpose of the study. The purpose of these questions is to offer some guidance on how to conduct the study; these questions are important in addressing the problem studied in this research (i.e., the lack of ICT implementation) (Mantzoukas, 2008).

This research was guided by the following overall question and sub-questions:

The Main question:

1. What are the roles of principals and the Ministry of Education in implementing ICT in schools?

The sub-questions:

1. What relationship exists between the Ministry of Education and the principals?

2. What are the educational objectives for implementing technology in public schools in Saudi Arabia?

3. How does the Ministry of Education plan to ensure that technology is implemented in schools?

4. Why is there insufficient support from the Ministry when providing new technology in public schools?

The main research question in this study addresses the major problem of a lack of implementing ICT in public schools in Saudi Arabia. It is important to know the functions of both the Ministry and principals in implementing ICT in order to identify the research problems. One of the issues in providing ICT in Saudi Arabian public schools is due to the lack of ICT tools. The role of the Ministry can be encouraging the use of ICT in schools, providing schools with the necessary tools, training the educators to properly use these tools, and so on. This research is interested in learning whether or not the Ministry and the principals play significant roles in enhancing ICT in schools.

Besides that, the relationship between the Ministry and the principals is important to explore in order to learn of ICT needs in general and ICT needs in particular. This research study intends to develop an understanding of the current ICT policy and objectives in order to find out whether the Ministry has implemented modern ICT in education. In addition, the formulation of a clear and concise ICT policy and objectives is essential in ensuring that schools are able to successfully follow the policies and meet the objectives. This study interest's is to recognize the recent and future plans in using ICT in schools and to see if improvements are made. Public schools still have a lack of technology support from the Ministry; one of the purposes of this study is to discover the reason for this. There are different types of supports; some include

funding, providing technology resources, training on ICT, etc. These questions will allow the researcher and reader to learn of the complexities regarding ICT in Saudi Arabian schools (Mantzoukas, 2008).

Design

The research design is a strategy and plan for conducting the research project to obtain answers to research questions. Research design can help the researcher to carry out the study in a proper and a systematic way (University of Toronto, 1998). The research design of this study include interviews was investigated the role of the Ministry of Education in implementing ICT. This research is divided into five chapters. The first chapter is introduction to ICT and its history. The second chapter, the literature review, identifies the importance of ICT and the problem statement. The third chapter focuses on the research method used in this study. The phenomena of interest in this study are the use of ICT in public schools in Saudi Arabia, why the adoption of ICT is so poor, and what the government is doing to address the situation. The respondents gave responses outlining their experiences as participants in this educational system. In the research method, the researcher used a qualitative approach, identified the research questions, described the data collection, and analyzed the data.

The data in the study were collected through interviews. Interviewing is the most basic form of inquiry that gives participants the opportunity to make sense of the things they experience (Seidman, 2015). Furthermore, interviews are particularly beneficial to explore the views and beliefs of the participant on specific matters and obtain in-depth information around the topic and the story behind an interviewee's experience (Edwards & Holland, 2013). To begin with, interviews were conducted with ten female public school principals and two male members

of administration of the Ministry of Education. Through conducting the interviews, the

researcher sought to establish the perceptions of principals on the progress of technology usage

in their schools as well as the extent to which the principals have met the goals set by the

Ministry of Education. These individuals gave their opinions on where the use of technology is

failing and whether the solutions that the government wants to implement will solve these

problems. In addition, the researcher sought to discover the reasons for the lack of ICT

implementation from the members of administration of the Ministry as well as confirm the

Ministry's plans regarding ICT. The questions posed to the principals and two members of

administration of the Ministry were unstructured and addressed how the Ministry is

implementing ICT in the public schools. Unstructured interviews are a strategy that asks

participants open-ended questions to explore a topic.

In unstructured interview, the researcher prepares a list of questions that need to be asked.

The interviewer may ask additional questions while interviewing to clarify the participant's

response or to explore responses further, and expand certain problems (Ritchie & Lewis 2003).

The unstructured nature of the questions allowed the interviewees more freedom in forming their

responses. Fifteen open-ended questions were asked to school principals, and eleven open-ended

questions were asked to the members of the Ministry to obtain the details for the research. The

forth chapter provides the results of this study. The analysis of the results are organized into

themes. The final chapter includes the discussion; the researcher explains the implications of the

data and concludes the study. This study was planned in this framework to allow for the smooth

working of the study.

Participants Targeted

In this research, the source of qualitative data was interviews with the sample population of principals and two members of the Ministry of Education who were willing to participate in the study. The target group of this study was twelve people directly associated with the Ministry of Education in Saudi Arabia. This group included ten female principals and two male members of administration of the Ministry willing to be interviewed. The participants' names are not mentioned in this research for privacy concerns. Seven schools in Riyadh, the capital of Saudi Arabia, were selected and three were chosen randomly and investigated. The city was broken into five areas: the north, east, central, south, and west. Two schools were chosen from each area and the results from each area were compared to determine whether or not there were discrepancies in ICT integration between different areas. The principals were able to provide a first-hand account of ICT integration in their individual schools and what additional teaching tools they are currently using.

Two members from the Ministry of Education were interviewed, and they were in an excellent position to provide insight into why the Ministry's implementation of modern technology has been insufficient in public schools. They were able to provide information regarding the government's plans to address issues of unequal ICT access.

The principal participants were all females, and this is due to the nature of the education system in Saudi Arabia. Apart from the private international schools, the education system in Saudi Arabia is fully single sex. The law requires that education from the first year in public school be single sex in Saudi Arabia (Burgess, Regehr & Roberts, 2013). Furthermore, the law requires that the teachers and the students be of the same sex. These single sex schools are well

organized, providing the necessary facilities required by each gender. This is attributed to the high Islamic values held by the government of Saudi Arabia. This form of schooling practiced in Saudi Arabia has faced its share of debates associated with single sex and mixed sex schooling (Hyman, 2010).

There is not a pre-existing relationship between the researcher and any of the participants; however, my relatives played an important role in helping to recruit the participants for this study. As a result, my relatives helped me to reach some of the schools. Participating in this study may not benefit participants directly, but it may help them to gain knowledge regarding ICT in public schools. It may also help them to focus more on the problem of this research the lack of using ICT in schools, and make some beneficial changes and plans in public schools.

Materials

The materials required for this study include note-taking equipment, an audio recording device, a laptop computer, Some documentation for approval for conducting the study from the Ministry of Education of Saudi Arabia, certificate of completion, ethical protocol approval, the consent form, the letter of information, consent for audio recoding, and interview questions. The approval for conducting the study form was taken from the Ministry of Education of Saudi Arabia to conduct the interviews in Saudi Arabia. The certificate of completion is basically an online tutorial course on research ethics. This course was one of the requirements for the Research Ethics Board (REB). When the researcher completed the course, she received the certificate. Ethical protocol approval was given to the researcher from the University of Windsor after the researcher filled out the application form for the ethical review, completed the course, and obtained the approval form from the Ministry.

The consent form and the consent for audio recoding were given to the participants to sign to confirm that they agree to complete a recorded interview. The letter of information contains brief information about the study; it was given to participants as well to keep. In addition to a digital recorder, pen and paper was used to take brief notes so they can be referred to as needed. A laptop computer was used for transferring the audio recorded files, for saving them, and for typing the interview transcripts.

Data Collection

Data collection is significant for this study, as the information collected will serve as the basis for addressing the research questions (Creswell, 2007). Data collection was focused exclusively on why the Ministry of Education has failed to implement modern ICT despite its previous investment in the use of technology in schools. After the researcher obtained ethical protocol approval from the University of Windsor Research Ethics Board, she sought approval from the Ministry of Education to carry out interviews. The researcher proceeded to interview the principals to gather information related to technology integration at individual schools; the interviews were done prior to interviewing the members of administration of the Ministry to gain an understanding of the Ministry's general approach and any district-wide shortcomings. During the data collection phase, the researcher visited ten schools. One of these schools is supported by King Abdullah bin Abdulaziz Public Education Development Project. This school is the best compared to the other nine. This school uses more technology. In addition, the school has received budget from the project and the Ministry of Education.

Due to the busy schedules of the principals and Ministry of Education participants, the greatest challenge involved in the data collection phase was arranging interviews with sufficient

time to ask all of the questions. To maintain the integrity of the data collection, all interviews were recorded; however, not all participants felt comfortable being recorded. DiCicco-Bloom and Crabtree (2006) stated that some participants might question the need to be recorded and feel concerned that the recordings may be distributed to third parties. To address these challenges, the researcher assured participants that their identity will never be disclosed to the public for confidentiality purposes. Their information and data are kept safe and their involvement in this study is never disclosed, and the participants are referred to by their pseudonyms when discussing the results. Interviews were scheduled at the participants' convenience to accommodate their schedules.

The researcher contacted the participants through emails and phone calls, and the researcher asked them if they would volunteer to participate. If they agreed, we scheduled a time to meet as well as the meeting location. All participants were informed through the information letter that their participation is voluntary; that they may withdraw at any time without penalty; and that they may choose not to answer any of the interview questions they did not want to. The school principal's participants were informed that the Ministry of Education would not have any access to the data and all participants were by volunteer and not required. Several interviews were held with two members of the Ministry of Education as well as principals of several schools. Interviews were held with two members of the Ministry of Education and they lasted about an hour. The interviews with the principals were held in their offices at their schools and also lasted about one hour. This allowed the researcher to explore questions in depth with each interviewee to gather sufficient information. The interviews were conducted during the day while school was in session, and were held after the examination period.

To make the process easier for the participants, the interviews were conducted in Arabic. The researcher translated the contents of each interview into English. Before each interview began, the researcher introduced herself, gave a brief introduction regarding the study, and asked for written permission to record the interview (using an Audio Consent Form). All the participants agreed to have their interview. The interviews were recorded with a digital voice recorder. The researcher took brief notes during interviews highlighting the body language of the interviewee. The duration to conduct the interviews was three weeks. It was difficult to schedule interviews with the members of administration of the Ministry due to their demanding schedule.

The unstructured questions have been set to gather information related to ICT in public schools. The interview questions did not request personal information. All of the participants answered all of the interview questions. Given the unstructured style of the questions, additional questions may be asked during the interview to expand upon or clarify an answer. No major risks or discomforts were anticipated for this study (e.g., physical, psychological, emotional, and financial). All information related to the interview is saved on my laptop, which is password protected. This information will be kept for three years. No one will have unsupervised access to the information. Only the researcher and the researcher's academic advisor have access to the uncensored study data, including electronic files, digital interview recordings, and transcripts, all of which will be destroyed within three years after the completion of the study. The interview transcripts were sent back to participants through their emails for verification of accuracy.

Data Analysis

The collected data are separated into two themes and analysed qualitatively. According to Kamal (2012), "Qualitative data validation focuses on assessing whether the information

obtained through the qualitative data collection is accurate" (p. 139). In preparation for the

qualitative data analysis, the answers collected from the public-school principals and the

members of administration of the Ministry were translated to English. Qualitative data analysis

requires that the data be coded. Open coding is "the process of grouping evidence and labelling

ideas so that they reflect increasingly broader perspectives" (Creswell, 2007, p. 209).

The data were uploaded to the researcher's laptop, and the interview transcripts were

typed into MS Word. After the interviews were transcribed, the researcher read all of the

transcripts and the brief notes to identify the common themes. The researcher highlighted the

recurring themes, and then she typed them in a new Microsoft Word file. The researcher created

codes from the transcripts to organize and sort the data based on the research questions before

she grouped them into according themes. The researcher analyzed the codes to find the

similarities, and then she grouped these codes into ten themes, which resulted in two categories.

The researcher created a table to organize these themes based on their categories. The first

category is *factors caused by the Ministry of Education* and it includes eight themes. The second

category is *factors caused by principals* and it includes two themes. The researcher analyzed the

data by choosing open coding and by reading every sentence. She chose this way of analyzing

the data so that it could be organized and made clear to the reader; also, this method allowed the

data to be summarized for the reader. It also allowed me to reduce large quantities of information

into labels, and this was easy to work with. The researcher listened to each interview three times

to ensure that all the information is right.

This research engaged in open coding in its basic form, so that it can help in naming,

contrasting, and writing memos as a way of developing relevant concepts from the available data

(Matavire & Brown, 2013). The researcher found differences and similarities in the concepts, a

method that yields discrete concepts which also had names. The data were displayed using suitable headings and a table to code data and identify patterns in the interviews. Conclusions were then drawn, highlighting key points from data analysis and addressing the research questions, literature, and limitations. This method is very effective at organizing the results (Glaser, 2004).

Trustworthiness

Trustworthiness of data is a major factor in qualitative data analysis (DiCicco-Bloom & Crabtree, 2006). Trustworthiness involves credibility, transferability, dependability, and conformability in the qualitative research (Guba & Lincoln, 1989). *Credibility* indicates that findings of the study are reliable and reasonable based on the research goal. Different methods can be used to ensure credibility (Creswell, 2007). *Transferability* means that the results of the study can be transferred to other contexts. *Dependability* means that researchers would acquire the similar finding if repeating the same context and methods (Guba & Lincoln 1989). The concept of *confirmability* implies that "interpretations and findings are rooted in contexts, not the researcher's subjectivity" (Kamal, 2012, p. 140).

"Qualitative research is frequently criticized for lacking scientific rigour with poor justification of the methods adopted, lack of transparency in the analytical procedures and the findings being merely a collection of personal opinions subject to researcher bias" (Noble & Smith, 2015). A main challenge for researchers is pursuing high quality when conducting research. There are some strategies to enhancing credibility and trustworthiness. After a researcher has finished analyzing the data, the researcher sends the data to the participants in a written summary that includes the themes that emerged. Participants review the data and send

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their feedback back to the interview. Member check is also common to ensure that the researcher's interpretation is accurate (Brikci, 2007). Reflexivity, which involves the researcher's belief, background, thoughts, and experience being able to influence the research project. Researcher can avoid research bias through "maintaining a reflexive journal to reflect and note thoughts and feelings in an effort to bracket perceptions and subjectivity" (Cope, Zhang, Saletan, Smiechowski, Jansen & Schmid, 2014).

Audit trail process is about a step-by-step record to trace all aspects of the research to establish the credibility and confirmability of qualitative research. An audit trail strategy is collecting field notes, data sources, documentaries etc., which reflect what was done and review what has been done to maintain a clear record of the study. This can help researchers to manage research data. The researcher can obtain feedback from another researcher to draw the same study conclusions. Providing a report of the research strategies and direct quotes from the participants to provide proof to the readers helps them to critique the credibility of the research and validate the interpretations (Noble & Smith, 2015).

This study faced some challenges; before conducting interviews, I was concerned about conducting these interviews in the most rigorous way. It is challenging to not be influenced by my experience and feelings; however, the researcher encouraged her self as a researcher to be objective and focused on reflecting what the research set out to answer in order to ensure reliability and validity. For example, some participants have asked for the researcher's opinion about a problem or topic; she has tried to avoid giving my personal opinion. As the researcher did not want to influence her findings. Instead, the researcher directed the participant to the next interview question. She tried to refrain from choosing participants that support my pre-existing

thoughts about the answers. This research followed a clear procedure, which allows the audience to fully understand how the data were collected and analyzed.

The results of this study will be published on the REB website by November 2017. The participants will be provided by the REB's Website link in order to access the findings of the study.

Results Interpretation

After the data have been analysed, the findings were compiled to provide a basis for future actions and research. The results were used to identify if any schools are deficient in their integration of ICT and what kinds of tools are currently used at each school. The findings indicated if the Ministry of Education has any plans to develop and emphasize the use of ICT in all public schools. A simple table was used to interpret the results obtained from the interview transcripts. The table was chosen as the primary means of displaying information as they effectively simplify data.

Research Permission and Ethical Considerations

Any ethical issues that arise during the study were addressed following the regulations of the Research Ethics Board at the University of Windsor. Ethical approval for the research was obtained from the Ministry of Education of Saudi Arabia prior to the start of the study. The Ministry was informed about the study in detail. An informed consent form for participants stating that participants are guaranteed certain rights, that they agree to be involved in the study, and that they acknowledge that their rights are protected was provided to all participants prior to

data collection. A statement about informed consent was made before each interview started, and participants confirmed their willingness to participate by signing the form.

The anonymity of participants was protected. The digital audio interview recordings were transferred to the researcher's laptop, which is password protected, and no one has access to the information kept. Participants in individual interviews were assigned pseudonyms when reporting the study results. Only the researcher and the researcher's academic advisor have access to the study data, including electronic files, digital interview recordings, and transcripts. All study data will be destroyed within three years following the completion of the thesis.

Limitation of Study

Limited studies have been done regarding the implementation of ICT in public schools in Saudi Arabia. This study analyses elements that act as barriers to the successful implementation of technology in the public educational institutions including schools. A major barrier is inadequate infrastructure. Inadequate infrastructure in parts of Saudi Arabia's interior makes it difficult for the Ministry to introduce technology to public schools in the affected areas. Lack of ICT expertise in the public schools is also a challenge, as training teachers in ICT incurs additional costs (Al-Furaydi, 2013). Another notable limitation is culture, as some individuals oppose the introduction of ICT on the basis that accessing the Internet will introduce students to non-desirable and immoral materials (Alenezi, 2015). The participants (school principals) are all females due to the nature of the education system in Saudi Arabia. As I mentioned earlier, the education system is comprised of a single sex.

In this study, data were collected through interviews; the data provide information on principals and ICT used in Riyadh schools only. If there had been time to extend the study to

other cities and rural areas it would have been possible to obtain in-depth information to augment this study's finding and to ascertain whether the findings are generalizable across Saudi Arabia or if they are specific to the principals who participated in the study. The timeframe was a significant limitation. The researcher only had three weeks to conduct interviews before the summer began. However, The researcher organized her schedule and set a goal of conducting a minimum of 4 interviews each week.

The study was conducted with a small sample of participants. The results of this study cannot be generalized to the entire principal population. Additionally, this study focused only on principals during the 2016-2017 school year. Aspects of ICT implementation can change over time. Based on the continuous development of ICT, its usage can vary annually. As the data collected in the study are influenced by the setting in which they are gathered, care was taken not to generalize the findings of the study.

Chapter Four: Analysis of Results

The previous chapter focused on the methodological framework, methods and materials used in this research, and the methods of data analysis. This chapter will report the results of the study, including the findings from the interviews with the school principals and the members of administration of the Ministry of Education. This chapter will present the barriers that affect the use of ICT. The section presents the key findings organized into a table.

The study identifies barriers in the integration of ICT in Saudi Arabian public schools. In general, the interview responses provided by the principals did not differ. Most of the participants identified barriers that address the causes for the lack of ICT use in schools. These barriers include lack of financial support, training, maintenance, infrastructure, communication, modern ICT equipment, knowledge of modern technology, curriculum, and beliefs. These are the main causes for the lack of ICT implementation. Most of these barriers were mentioned by the majority of participants. This study has found that two primary causes that have led to the challenges of using ICT.

The first cause is the Ministry of Education, as it is responsible for the entire education system. Most of the participants stated that the Ministry has yet to implement ICT efficiently. During the interviews, most of the participants mentioned that the barriers include lack of financial support, training, maintenance, infrastructure, communication, modern ICT equipment, and curriculum. As the researcher mentioned in the literature review section, the Ministry is responsible for maintaining public school buildings and supplying schools with educational materials, hiring instructors and paying their salaries, providing equipment and ensure it is up-to-date and in working condition, and other required facilities. The curriculum, textbooks, and

syllabus are uniform in Saudi Arabia (Kamal, 2012).

The factors that are created by the principals or that were given by the principals include a lack of ICT knowledge. Principals' beliefs may be altered if the Ministry guides them in improving education. Through the interviews, it was reveled that most principals have a limited knowledge of modern ICT, maintenance, and diversity in using ICT tool in education, the advantages and disadvantages of ICT etc. Their knowledge is limited to PowerPoint and SMART Boards. The majority of participants did not mention educational games, learning through social media, online learning and other modern technologies because advanced technologies have not been provided in most public schools. The majority of participants reported that there is a lack of training. However, we cannot deny that the principals are also responsible for their own professional development, which encompasses ICT. They can learn about modern ICT online; online sources and videos are good options for improving ICT knowledge.

Table1 below provides a list of barriers that were mentioned during the interviews by the school principals and the members of administration of the Ministry. This table demonstrates the barriers affecting the adoption and use of ICT in public schools; however, as depicted below, the majority of the barriers are attributed to the Ministry of Education.

Table 1

Identified barriers and factors caused by the Ministry of Education and principals

Cause of creating these barriers	Barriers affecting the use ICT	Number of participants
Factors caused by the Ministry of Education	Budget	11
	Training	10
	Maintenance	10
	Infrastructure	9
	Lack of communication	8
	Curriculum	6
	Lack of a clear vision	6
	Lack of modern ICT equipment	11
Factors caused by the principals	Lack of knowledge of modern technology	8
	Beliefs	3

Factors Caused by the Ministry of Education

Budget. Saudi government allocates an education budget for the Ministry of Education. The Ministry is responsible for following the budget policy for all public education sectors. Budgets can be barriers to the overall success of public schools (Almalki & Williams, 2012). The Ministry sends funds to schools each year; however, the budget is only for specific needs

of the schools, and it does not include ICT tools. Most of the participants stated that the school's budget is not enough. Ten of these participants were principals, and one was a member of the Ministry of Education. They stated that the budget has decreased since 2016. All principals informed that the budget has been reduced since 2016. Furthermore, the principals stated that they are not allowed to buy any technological tools for the school from the budget because the Ministry of Education is responsible for providing modern technology.

However, seven out of ten principals have purchased tools, including projectors because the Ministry of Education does not provide them with such resources. These principals felt that they are responsible for providing tools to their school even if the budget is not enough. From their experiences, they have struggled a lot to provide basic tools for their schools. They shared that the school budget they receive fails to cover the school's needs. One of the principals spent 70,000 Saudi Riyal at her own expense to purchase tools and materials. When she asked the Ministry of Education to reimburse her, she received the following response: "We did not ask you to pay for all these materials." She stopped talking; she seemed hesitant to continue. After that, she smiled and said, "Please this conversation is between me and you." I reminded her that anything she shares during the interview will be kept confidential. The principal proudly continued talking about what she has done for the schools. In addition, another principal reported that "Sometimes I have to pay from my pocket to provide technological tools and maintenance." She described herself as a leader, not a principal. She was very calm while she was talking about the issue.

The participants from the Ministry of Education agreed that the budget has decreased since 2016. He was reluctant to discuss this with me, as the subject was sensitive for him. He claimed that, "Principals should not have purchased technology tools for the school. It is not

their responsibilities." I asked this participant if he could comment on the fact that although there is a budget allocated for education that is approximately one third of the state budget, why is there a deficit in school funding? He answered:

> I admit that the budget is high, but in the last ten years we have spent billions on scholarships without strict monitoring, and the Ministry of Education wants to reduce rented schools as much as possible, so by 2017 and 2018, 50% of rented school students will be included to the government schools. Now we have plans that have been discussed with the minister regarding the education budget.

He assumed that there would be an improvement in the budget. He was to the point; he provided a concise answer, unlike the principals who were emotional in responding. He did not want to express or discuss in details about the subject.

The second member of administration of the Ministry mentioned that the budget would be enough for schools if they do not purchase technological tools from the budget. The Ministry of Education seeks to provide modern ICT. He believed that it is the principals' fault; they should have not purchased any tool, according to him. He expressed that he was upset as the principals always complain about different things, but they do not know the Ministry's efforts in education. He receives a lot of complains from many schools, this participant expressed, but he believes that the Ministry is always concerned with providing the best for schools.

The school principal under the King Abdullah Project pointed out that the Ministry of Education's budget is not adequate for tools and materials for the schools, but that they receive a budget from the project. The budget they receive from the project helps them with ICT maintenance and in providing ICT equipment. She is pleased that her school is one of the King Abdullah school project. She continuously complimented the project and spoke of how it

supports schools. She said that, "the school has been under the project for more than ten years, but we never experienced any problem or dereliction from the project." She was proud that her school is notably different than other public schools. Overall, most the schools that I visited have budget deficits, but the level of deficit differs from school to school. The deficit is dependent on the school's needs; for example, some schools had to purchase projectors because they do not have them. The budget plays a necessary role in the functioning of the school. It ensures the achievement of the school's objectives and motivates teachers and principals to improve their performance (Baytak, Tarman & Ayas, 2011). When the Ministry makes every possible effort to plan and administer properly for the budget, the budget deficit may disappear.

Training. The Ministry sometimes provides training courses for teachers in different subjects. These courses are not for all teachers, and they are not mandatory. Among these subjects is ICT; unfortunately, the Ministry provides a few ICT courses according to the principals. Furthermore, principals in some schools encourage expert teachers to train their colleagues on the available ICT tools. In this study, the majority of the participants stated that the Ministry of Education provides a few training courses on ICT.

Principal A stated that the Ministry of Education began to ask them to use technology in 2005. They required them to take training courses and use technology in their teaching, yet they did not provide any training courses. As the principal mentioned, she worked on independently to improve her computer skills. She worked hard and struggled to learn how to use the computer. She said, "It has been almost sixteen years since I learned the basic computer skills, and I encouraged teachers to learn with me." She believes that principals have to know at least the basic computer skills before starting their job as a principal. "I am not waiting until the Ministry provides courses; I am the principal so I have to keep the school's best interest in mind."

Principal B shared that sometimes the Ministry of Education provides some training courses, but the courses are not mandatory for teachers. Many teachers prefer training inside schools, which I provide for them once a year.

> I encourage teachers to take advantage of courses that the Ministry provides. I want my teachers to be aware of all courses, not just ones with an ICT focus, but in all teaching and school matters. I believe that training for ICT use is important, but the school only has projectors and SMART Boards. Training on how to use these tools does not require a lot of time. I blame the Ministry for not offering enough courses to teachers, which in my opinion, should be made mandatory.

Principal C agrees that the Ministry of Education provides a training course. This course is once a year, and only one to two teachers are allowed to attend the training. She said:

> Even though the Ministry of Education takes one or two teachers for training, the training provides the rationale for the importance of using technology in the classroom, but no specific training on how to incorporate modern ICT is provided. I feel sorry for teachers because some of them have the desire to learn through these courses, but they can not attend every year. Only one or two teachers are allowed to attend in a year, and I have to provide the opportunity for all teachers to attend and complete the courses.

The principal felt unhappy, and her voice changed; she expressed that,

> Every once in a while, new teachers come to the school, and a few of them break my heart. They have come to my office and explained their financial status, which is insufficient in allowing them to register in courses. They have a desire to improve their teaching; I have tried to look for free courses for them, or courses at a nominal price. I

also provide lessons in school, especially for new teachers on how to use technology. I

am unable to bring external trainers or pay for training courses.

Principal D added that when she started using technology many years ago, the Ministry of

Education provided training courses for a week duration for teachers and principals. In one week

we learned Excel, Microsoft Word, PowerPoint, etc. She mentioned "We have not received

training courses from the Ministry of Education after that." She was surprised when I asked her

about the training courses. In her opinion, the Ministry is supposed to follow up with all teachers,

even students to improve their ICT skills. She spoke for five minutes about the importance of

training for the schools and education systems. She was very engaged talking about the topic. "I

hope the Ministry deals with this issue soon. I am a principal, and I do not have the power to

change this situation, but I can offer my help."

Principals E, F, and G agreed that teachers have never received training courses from the

Ministry of Education. Principal E stated that:

> I have tried to contact the Ministry through the website requesting they provide some
>
> courses for teachers, but I have yet to receive a response. I never gave up. Several
>
> years ago, some teachers' computer skills were limited, so they were not able to write
>
> down student names and grades on the computer. I forced them to learn and write it on
>
> the computer step by step.

In her perspective, this is the impact that a principal can have on teachers and the school.

Principal F commented:

> Even though the Ministry has not provided training for the school, teachers can
>
> survive without training. In my opinion, taking training courses is important, but as
>
> humans, we can learn by ourselves through online resources, by exploring, and

through practice. I am not saying that I am satisfied about the Ministry's role in

training, but as I said, teachers will not be lost if they do not receive training from the

Ministry.

 Principal G expressed that:

I have been a principal for twenty one years. Teachers of ten to fifteen years are

different than new teachers. Experienced teachers have a difficult time learning

computer skills. New teachers learn fast because they are used to using technology

tools as many of them use them everyday. I am not too worried about new teachers.

 The school principal under the King Abdullah Project said that "we are under the Ministry of

Education's responsibility, but we are also supported by the project. Teachers in the school have

trained with professional trainers, some of them who came from overseas." She smiled and said,

"my school is different than other public schools; the project has helped to improve my school

and teachers." She did not talk much about the Ministry and training.

Two of the participants were members of administration of the Ministry in the Ministry

of Education, and both agreed that the Ministry of Education has not provided many ICT training

courses. Member A mentioned that the Ministry has not provided courses without any

explanation. Then, he expressed that he does not like to be interviewed, especially when the topic

is his career. I told him he can withdrawal from the interview at any time. He said, "Please ask

the next question." Member B stands behind the Ministry. He mentioned, "Even though the

Ministry does not provide courses, principals should not blame them for this. The financial status

of the country has been unstable for the last two years." He raised his voice and said, "I have

faith that the education in Saudi Arabia will significantly develop, and all principals, teachers

and students will be proud of it." All participants in this theme stated that the Ministry has

provided a few courses or no courses regarding ICT. The previous eight principal participants

provide training on SMART Boards, but there is no training regarding maintenance. Training is

substantial for all teachers, especially new ones. New educators have many challenges that they

face in teaching in general; effective training can help prepare them for these challenges.

Educators need to learn to harness and implement technology properly as well as to practice

teaching with ICT. Active learning combined with effective mentoring can help enhance student-

centered teaching (Al-Hattami, Muammar & Elmahdi, 2013). The Ministry needs to train

teachers to understand how and when various ICT tools best support the curriculum.

Maintenance. ICT maintenance is the practice of repairing ICT equipment. Maintenance

became one of the commonly reported by participants. It includes updating software, fixing or

changing cables, and repairing tools (SMART Board, all computer equipment and projectors).

All information and communication technology systems are under the responsibility of the

Ministry. However, the Ministry still has a deficiency in school maintenance (Aljuaid, 2016).

Most of the participants agreed that there is a lack of maintenance from the Ministry of

Education on technology tools. One of the participants is a member of administration of the

Ministry.

The member commented that:

> We provide maintenance in all schools, but it should be for only the tools that the
>
> Ministry of Education provided. I admit that the process to provide maintenance could
>
> take a long time, and we have received complaints from different schools. Believe me
>
> when I hear these complaints, I get upset. I know that schools need to use ICT
>
> everyday.

He took a deep breath and then said, "Between you and me, education is a huge responsibility."

He wanted to share more, but he was hesitant. He stopped for seconds and ended with "There is

always hope." The Ministry of Education is improving plans, and I am sure maintenance is one

of them." I asked him why there is a lack of maintenance. He answered, "Mistakes from some

employees could slow the work. I believe that we learn from the mistakes we make." He ended

with "I told you the truth because I am honest." He seemed upset when he talked about

maintenance.

The other 9 participants were principals. They believe that the Ministry of Education takes

a long time to send technicians to complete the maintenance. All the principals reported that the

Ministry of Education does not provide maintenance on any technology tools that their schools

use. Principal A said that she brings an external technician to do the maintenance. She expressed

that, "this topic bothers me. I have struggled to find an expert external engineer at a good price. I

become frustrated when I ask the Ministry to replace or fix a tool because I know it takes us

months to follow up with the Ministry." She smiled and said, "I prefer not to be stressed, so I

bring an engineer." Principal B who is under the project stated that:

> We have a store that carries new projectors. We call an external engineer to replace the
>
> old one with the new one. The Ministry of Education does maintenance only on tools
>
> and electrical appliances. However, they take months to come, so we have to follow up
>
> with them every day until they come, and that requires a lot of resources on our behalf,
>
> such as time and effort.

She did not seem as concerned as the other principals did about the problem. In all her responses,

she mentioned the project's advantages in the school.

Principal D commented, "We collect money from school canteen for the maintenance; the Ministry of Education never provides maintenance for the school." She seemed unhappy about her school's situation. "I feel uncomfortable when I take the money from the canteen, but the school still needs ICT tools. I wish the Ministry provided the school with all the tools we need." She raised her voice and said, "Do you know that I am so tired of being a principal. The responsibilities have become heavier, and there is not enough support from the Ministry." Principal E said that, "One time we called the Ministry of Education to fix the projector, and they brought someone but instead of fixing it, he ruined it. I was surprised when he ruined it." She talked calmly, and expressed that she never thought managing would be like that. She keeps thinking about the school's needs, even at home. She said, "Sometimes I talk with my family or friends about the stress that I get from the school. It is not only about maintenance, but it is about the difficult situations that sometimes I deal with. When I was a teacher, I was enjoying my career more."

Principals F, G, and H provided shorter responses. They only said that there is a lack of maintenance from the Ministry, and they bring in an external engineer. In the end, most of the schools in the study have deficiencies in maintenance. The lack of technical support is regarded as a hindrance to ICT. It is significant to keep all tools in good condition, so that teachers can smoothly use ICT in the classroom. The Ministry needs to provide maintenance to all schools to make sure that educators will not be interrupted during their lessons (Alhawiti, 2013).

Infrastructure. Infrastructure has a negative effect in most schools. In this study, basic services were mentioned such as the electric supply, electricity and physical facilities for school equipment in general and ICT tools in particular for education. Infrastructure is still a challenge in Saudi Arabian public schools (Alresheed, Leask, & Raiker, 2015). Most participants in this

study shared that the school infrastructure is weak. Two of the participants are members of administration of the Ministry. Both agreed that the infrastructure is not that strong, and some schools' infrastructure needs to be changed or rebuilt.

The member A stated that, "there are many old public schools that were not built well, especially in the old and poor neighborhoods." In the poor areas, such as the south side and the west side, schools have poorer and weaker infrastructure. He was disappointed about this issue not only in education but also in Saudi Arabia in general. The member of administration explained that the infrastructure is not appropriate. He is not an expert in this subject, so he did not explain much. "The infrastructure is not my specialty, but I know many schools have a lack of infrastructure. I cannot give details about the problem, but I can give some recent and future plans that could help reduce the problem of infrastructure." When I asked the member B the question that related to infrastructure, he asked me politely to skip this question because he has limited knowledge about the topic.

Seven principals mentioned that the schools' infrastructures are not durable. They stated that the electricity would at times cut during the summer from the pressure of the heat. As a result, we need to be careful not to use too much electricity. Principal A mentioned her experience with infrastructure; she was exited to share her situation.

> Last fall we had power outages more than three times because of the electrical pressure. On one of the three occasions the power outages lasted for more than an hour. The electricity was hot, so I was afraid to turn it on. Teachers could not complete their lessons, and it was very warm in the classroom. For me, it was a bad experience.

Principal B pointed out her perspective through the following: "My school is not old, but I think when the school was built, the government did not take into consideration the technology and its cables that will be used. Principal B did not give a reaction to this situation."

Principal C commented that "I get upset when we have power outages even if it is just for seconds. This is a place for education, and it should be better than that. I do not want to complain; I just want to say that I thank Allah that we are safe, and that we have a good education. Some countries do not have school buildings." Principal D commented that, "We have experienced power outages sometimes during the summer." Principal E explained her fears with infrastructure. She mentioned a situation that occurred in the past regarding the poor infrastructure of the school has.

> It was raining a lot in the winter; the rain did not stop for two hours. A part of school's field was flooded. Students wanted to play in the field once the rain stopped. Two children were playing on the water and their clothes were wet. One of the children had a severe flue, and she went to the hospital for three days. Her mother came to the school after her daughter recovered. She was upset about what happened to her daughter.

The principal felt remorseful about what happened and commented, "It was my fault as well as the Ministry's because I reported this problem many times, and they did not fixe it."

From all the schools that I visited, there are two-rented schools. This means that the government does not own the buildings. Principal F, who was one of the principals in the rented schools, displayed disappointment. She commented that the Ministry of Education gives priority for owned schools more than rented schools.

I tell you that because it is not fair, but please do not let anyone know that I have

shared this. Delete it after you finish. There is a school just a few blocks from here.

The government owns that school. The school has better classrooms and facilities,

more ICT tools, and less infrastructure problems. This is upsetting to me. Why are

there differences between owned and rented schools?

Principal G expressed that, "Rented schools suffer from lack of infrastructure because these

buildings were prepared for housing. The infrastructure in theses schools is poor, and I have

experienced power outages and sewage services. There is nothing to do until the Ministry builds

a new building for the school."

School infrastructure is one of the main elements to ensure access to teaching and learning.

Schools need to provide learning that offers activities and promotes the use of ICT as a tool

combined with active learning. The successful conduct of these methods depends on the

availability of good infrastructure. The Ministry has to plan to reduce this problem through

setting new policies that will ensure new and old schools will have proper infrastructure.

Curriculum. Curriculum is unified for all public and private schools in Saudi Arabia. The

curriculum has been updated in recent years to facilitate technology as a tool that can help to

progress the teaching process (Delong-Bas, 2013). Even though the curriculum has been

updated, some of the principal participants found that math and science are the heaviest subject.

Principal A felt sorry for her math and science teachers because they teach approximately 24

classes a week. She expressed that, "They feel a lot of pressure, and this pressure sometimes

prevents these teachers from using technology. I do not blame them; some of them already have

a busy schedule at home. I am trying to not push them and ask their colleagues to help them with

marking examination and papers, for example." She explained her suggestions and opinions on how the Ministry can hire more teachers so that the number of classes would be decreased.

Principal B was enthused to say her opinion "Math and science are heavy and hard for both teachers and students. However, science is the hardest; there is too much information, and the textbook is not clear. Students enjoy learning in a variety of ways. If the textbook is not interesting and unclear, students engagement will decrease." Principals C stated that, "Math is thick and math teachers have complained that they are teaching 24 classes a week, and it is hard for them to use technology in all the classes because of the pressure from all of their teaching demands." She was sympathetic with math teachers; she expressed that, "They are humans not a computer that you can turn on for a long period of time. They have a limited capacity, so the amount of work that is expected from them should be reasonable." Principal D pointed out her opinion "Science is deep, thick, and not clear." She was concerned about science teachers. She stated her point, "Teachers are concerned regarding how to deliver the information to the students with using technology effectively. Even though the curriculum is updated, some science teachers struggle with the textbook." She does not agree with the curriculum updates, as it now seems to be more difficult for teachers to teach than it was before the updates were made.

Principal E acknowledged that, "The problem is with the curriculum. It should be creative and interesting for students. The curriculum is heavy and it is not clear; even teachers can't be creative." In her perspective it is easier for teachers to use traditional methods instead of technology because there is a defect in curriculum. The principal was very upset about this subject. She was unsatisfied about changing the curriculum. She expressed that "I want my teachers to do their best and be the best, but there are some factors that can create difficulties for

teachers to achieve their teaching goals." Principal F's perspective about curriculum is that education forty years ago was better than it is today. The curriculum was simple, and the teaching was easy. She indicated her experience with teaching:

> I was a teacher many years ago. My students enjoyed my teaching, even though I did not use technology. The curriculum was easier, and I taught for seventeen years; none of the students complained about my teaching methods. When I became a principal, I received complains from both students and teachers about the curriculum and the methods the teachers use.

These principals feel that the curriculum is thick and that teachers are too busy and under a lot of pressure. The curriculum could prevent teachers to be creative with technology. Some principals suggested that the Ministry of Education should provide some courses, lessons, and books for teachers. These resources should explain to teachers how to present their lesson, how to apply different teaching methods, how to be creative, and how to use technology in an attractive way. Overall, a substantial step in integrating ICT into the curriculum is training teachers how to effectively apply ICT in their classrooms. Integrating ICT into the curriculum can allow students to better understand technological advancements (Khosrow-Pour, 2013). As a result, the Ministry should be more involved in the implementation of technology in the classrooms. The integration of ICT should also serve as a means to expand, guide, and enhance learning objectives (Abdul-Qadir & Hussain, 2013).

Lack of communication. There are different methods of communication including written communication, online communication, face-to-face communication, and oral communication. The Ministry usually uses online and oral communication, and sometimes they use written

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communication. In this study, participants indicated that the Ministry has provided online websites to facilitate a relationship between the Ministry and the staff in the education sector. Most of the school participants communicate with the Ministry of Education through the Ministry of Education online website. The website has different programs for communicating with members of the Ministry of Education, and it has useful programs for teachers and students. Although all of participants agreed that the online communication is easier and faster than before, they are still suffering from delayed responses, especially when it regards requesting technology tools or maintenance. There is no direct connection between principals and the Ministry of Education headmasters as well as there are no meetings. The Ministry of Education does not send supervisors to check on ICT tools in schools. They send supervisors to assess teachers' teaching and teaching methods. One of the assessment items contains using technology in the classroom.

School principal A under the project stated that, "There is a supervisor from the project who visits the school to check on the school and the school's use of technology in the classrooms." Moreover, the supervisor checks whether the teachers need training, and the supervisor follows up with the teachers and students. The project places an administrative coordinator at the school. The administrative coordinator follows up with the Ministry of Education every morning and afternoon. She communicates with the Ministry of Education, online, through the website, and over the phone with the Ministry of Education. The coordinator continues to follow-up with the Ministry of Education until the coordinator receives proper resources, which can take a long time. The principal was upset about the lack of communication between the school and the Ministry. She expressed that, "I do not have the patience that my

administrative coordinator has. She never gives up; even if it takes a lot of her time. The

Ministry's staff does not appreciate our times or our needs." Principal B smiled and said:

> The funny thing is I ordered computers two years ago, and I still have not received
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> them. Honestly, I will not waste my time and efforts to request to follow up regarding
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> the computers because I already did, and there are no results. I realized that when I ask
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> the Ministry for tools or materials, I become stressed because I have to wait a long
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> time and check with them until they provide them.

Principal C pointed out that when we order or ask for something, the Ministry of Education

members take weeks to respond. She seemed to be miserable, and she discussed in a depressing

manner. The principal expressed that she hated the website "When I request an order for

technology tools, sometimes the website is down, so we have to wait to place the order,

sometimes not being able to place it for two to three weeks." She raised her voice and said "we

deal with a silent machine. Student enrollment in the school has been increased, so we have to

communicate with the Ministry of Education that they should provide is what we need."

Principal D believes that the relationship between the school principals and the Ministry is

important. The Ministry and principals complement each other. "I struggle to receive what I have

requested. I am sure that most principals would say the same. In 2014 I asked the Ministry to

provide us with a SMART Board for my school. I barely received it in the end of 2015."

Principal E directly said "There is nothing to say about that because there is not real

communication with the Ministry." She did not explain much more than that. Her response

showed that she is sensitive in this subject, and she went through some difficulties to

communicate with the Ministry.

Principal F explained that:

> I lose my patience when I use the website to request an order. Two years ago I requested projectors and a SMART Board. The request took a long time, so I had to call one of my relevant relatives, who works in the Ministry, to help me with my request. I do not like to use an intermediary to finish my work, but sometimes I have to if it is the only way. Being ignored encouraged me to try a different way to get in in contact with the Ministry.

She seemed helpless regarding this problem. Principal G expressed that some of the staff in the Ministry who specialize in ICT are unprofessional, and they can not deal with principals. "I ordered a SMART Board, and I called several times to ask about the order. One of the staff members told me that I should be grateful because I already have a SMART Board in the school. I was dissatisfied with her response." Principal H's perspective is "There are limited benefits for using the website because sometime we do not receive what we request. I prefer face-to-face communication for several reasons: I as a principal can share my concerns about the school and the use of ICT. I also can suggest some ideas that are beneficial for the school." She sees that it is a difficult situation when principals hardly communicate with the Ministry. Through the interviews, school principals are aware of communication barriers with the Ministry. It is important to build a reciprocal relationship between school principals and the Ministry of Education. The Ministry needs to arrange meetings with schools principals to exchange information about the effectiveness of ICT that is already being applied in schools and that will be applied in future practice.

Lack of modern ICT equipment. Saudi public schools encounter a number of difficulties in integration of ICT, and a lack of equipment is one of these difficulties. Lack of ICT equipment, which includes hardware and software, is the prominent barrier to the integration of ICT in education. In this study, lack of modern ICT equipment is the main problem in implementing technology in public schools. The majority of participants agreed that there is a lack of ICT tools. Most of the schools I visited have SMART Boards and projectors. The newest tool in these schools is the SMART Board. Schools have not gone beyond that. Even these schools are experienced a lack of SMART Boards. Four schools have a lack of projectors, and seven schools have a lack of Internet access. I visited three middle schools and four high schools; all these schools have lack of computers. In the computer lab, computers are not sufficient for students. Every two students share one computer.

Both members of administration of the Ministry commented that the Ministry has provided at least one SMART Board in all public schools in Riyadh. However, public schools need more ICT tools. The Ministry has planned to provide some in the next few years. One of the members of administration said that, "I agree that education has changed; we replace traditional methods by applying technology and active learning strategies. However, we still need to provide and work on modern ICT in education to improve the education." He was confident, honest, and explicit while he was talking. The member of administration thinks positively of the Ministry. He expressed that, "I always look at the bright side. It is right that many schools have lack of technology tools, but there are some plans that can help improving the use of ICT in education. I know the problem is real, but I believe that the Ministry can control it." The second members of administration shared that:

In the last years we have had some achievements regarding technology; for example, the Ministry of Education website provides helpful and useful programs for principals, teachers, and students. One of the programs is iEN (National Education Portal); this website provides online textbooks for all grades, includes online lessons with excellent teachers, and has educational videos that explain the lesson in interesting ways.

He was trying to highlight the achievements of the Ministry instead of focusing on the problems. The member of administration only talked about the Ministry's achievements.

However, none of the nine participants mentioned any of the positive things that are included in the Ministry of Education website. Principal A claimed that, "The ICT tools we have in schools are projectors and SMART Boards. We have two smart boards in the Resource room for the entire school, and the teachers arrange a schedule amongst themselves to book this room so that they can have access to a SMART Board. There is, however, a projector in every classroom." She was complaining about her school situation. "I provided many projectors to all classrooms. In the beginning of last year, I had the courage to buy projectors from the school budget and because of that the budget was low, and I struggled to provide other school materials. I felt comfortable when I purchased the projectors, and I do not regret that decision." Principal B declared that, "We don't have SMART Board in the school, but every class has a projector. The Ministry of Education just has provided two, and the rest we have provided from the school's budget." She wished her school had a SMART Board.

I am tired of requesting a SMART Board from the Ministry. I am still waiting to obtain one. I blame the Ministry if my teachers do not have diversity in using technology because the school needs more tools. To be honest, it is not fair that the

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distribution of ICT tools to schools is not unequal. I know that students and teachers

feel bored of using the same tool everyday.

When I asked Principal C about the ICT tools in her school, she took a deep breath and

swore that she has tried her best as a leader to provide tools. She said:

School leaders have the hardest position in education. They lead the entire school

including teachers, students, equipment, etc. They are responsible for every thing that

happens in the school. One of my responsibilities is to provide projectors to all

classrooms. I have already provided some, and I will provide more when I can. For me

it is a big responsibility because I have to challenge myself to provide these tools.

Principal D commented that,

I will never forget the help I received from people to support ICT in my school.

Students' parents and some teachers have donated projectors for the schools. I felt

happy and I am proud of these parents and teachers. My school still needs more tools,

and it is the Ministry's responsibility. The Ministry should supply all the tools that

schools need.

She expressed that teachers are collaborators and have the desire to help the school.

Principal E smiled and mentioned:

I only have 2 out of 22 classes that are provided with technology. One was equipped

by me and other one by the Ministry of Education. The class that was quipped by

Ministry of Education has a projector, 4 computers for students and a SMART Board.

There is a schedule for using these rooms, and not all of teachers can use these rooms

everyday. These rooms are especially for math and science teachers.

Teachers are having touch times using these rooms. She explained that the teachers and students are victims; teachers bring their laptops and projectors to school. Other teachers do not have their own laptops and projectors, so they borrow projectors from their colleagues. She commented "I feel sorry for the teachers and students. Some students come to my office and ask me to provide SMART Boards in their classrooms. I am trying to please them, and I swear I work hard to provide ICT tools. I organize a Bazaar every so often to collect money and provide ICT tools." Principal F expressed that she is disappointed in the Ministry.

> The Ministry of Education provides a projector after a year of requesting one, and they installed the projector a year after the request has been approved. I become nervous when I order a tool from the Ministry because I know it takes a great deal of effort and time. In my opinion, the Ministry should support school leadership by meetings all of the school's needs.

Principal G suggested that:

> Being a principal is not enjoyable to be honest. I have been a principal for twenty years, and thank God I have requested for a retirement next year. I have served the school for years, and I have been struggling to improve the school. The Ministry sometimes ignores our requests, and that makes me upset.

She seemed unhappy in being a principal because of all the responsibilities she had with little support from the Ministry. Principal H claimed that she has become a stronger person when she started leading the school. She has been through many difficulties, and she has learned some life lessons in school. In her perspective:

> I like my job because I am dealing with humans and tools. I can control any situation when I follow my brain and not my feelings, and I prefer to deal with my problems

calmly. My school has a lack of technology, and although I am unsatisfied about this, I

always encourage my teachers to be creative in their lessons and to apply active

learning when possible. When the teachers cannot use technology, I encourage them to

apply a student-centered approach without ICT.

Principal I clamed that the school needs to be provided with technologies. She expressed

that:

> I hope the Ministry understands the seriousness of this situation. I inform the
>
> Ministry about the school's status, but I do not receive a response. I am not sure
>
> when this problem ends; I feel that I am under pressure. Teachers always complain
>
> about deficiencies in teaching and ICT tools. The Ministry requires teachers to use
>
> technology, but they have not provided adequate tools. It is a big challenge for me,
>
> and I hope I can overcome it.

The principal who is under the project said that:

> We have distant learning in the school; teachers teach math and science for 2 to 3
>
> schools for the Saudi Southern Borders province. The school has satellite and a
>
> television in one classroom. The school also has twelve SMART Boards and
>
> projectors in all classes, in which five SMART Boards and six projectors were
>
> provided from the Ministry of Education.

The principals have provided ICT in schools in their own ways, and it was revealed that they

feel they are responsible for equipping their school with ICT. They have experienced challenges

in providing ICT. Schools still have scarce Internet access, and that can prevent educators from

using online sources. The principals had different experiences with ICT. In the interviews, principals were unsatisfied with their school's situation regarding ICT. It is important that the Ministry equips all schools with different ICT tools; students learn in different ways and technology as a tool can support divers learners. The available tools in schools are projectors and SMART Boards; the Ministry needs to review its ICT policy and ensure that all schools have modern ICT in all classrooms. It is significant that schools have ICT in all classrooms, so teachers can use it to support their teaching practice, and use it as a tool to diverse in teaching.

Lack of clear vision. The ICT policy is produced by multiple organizations under guidance of the Ministry responsible. The Ministry of Education has its own objectives and policies regarding ICT. The educational policy in Saudi Arabia is unclear and poorly communicated, in addition to it being difficult to implement (Algamdi & Samarji, 2016). In this study, most participants have concerns on ICT use and the clarity regarding what to do after the technology-related infrastructure is established. Most principals are aware of the education reform, and they believe that the Ministry of Education has no clear vision on how to supervise this reform at the national level. When the Ministry of Education starts to reform, some schools need to be rebuilt or changed because of the infrastructure. In addition, the Ministry of Education enforces its policies regarding technology, but it does not have a clear vision on how to formulate these policies in order for schools to implement them properly.

The school participants stated that the Ministry of Education gives orders and policies, but it does not instruct us on how to apply them. For example, the Ministry of Education gives to principals the assessment form for assessing teachers; one of the items is that teacher uses technology in class. However, the Ministry of Education does not provide what school needs, nor does it provide training for teachers to implement ICT. It also fails to give instructions on what

the Ministry of Education wants from teachers. Principal A reported that "I will be honest with you, there is no ICT policy in the school. Teachers do not follow specific rules to apply and enhance ICT. In my opinion, the Ministry has failed to implement ICT policy in education." Principal B thinks that it is preferable when the school creates its own ICT policy. "The Ministry has not effectively implemented ICT in education, so how can they create a successful ICT policy?" Principal C mentioned that "The problem is that the Ministry sets objectives and policies, but they do not apply them correctly. As a principal, I do not know about the ICT policy because we have not received any document regarding it."

Principal D's perspective is that "ICT policy should be established based on the culture, budget, schools, and curriculum. From my experience in leading, there are no strict rules of implementing ICT until now; also, the school has a deficiency in ICT equipment." Principal E feels that "It is difficult to implement ICT in the school. The school building is old, electrical wiring is not proper, and we do not have Internet access in classrooms. The Ministry needs to resolve these problems first, and then implement ICT tools." Principal G shared her story when she was in one of the Middle Eastern countries:

> I went to a country to visit a friend; she is a principal in a public school. I was curious in visiting her school. I went there to take a look at the school. I do not like comparing, but there are differences between her school and my school. The classrooms were equipped with multiple ICT tools. Students can easily access online recourses and programs, and the Ministry has provided them with different educational software. The main reason for the successful use of ICT is that the ICT; the ICT policy is well implemented and effective.

Through sharing her experience with me, it was clear that she has experienced positive examples of implementing ICT policies in education systems.

The members of administration of the Ministry did not agree that the ICT policy is unclear. They have talked about some of the future plans and objectives, including providing ICT in schools. They were so confident when talking. One of the members of administration of the Ministry seemed upset when he learned that some of the school principals claimed the ICT policy was unclear. The establishment of ICT policy is an important step in ensuring that it will assist education in general and schools in particular to achieve objectives. The ICT policy can help to ensure that the ICT infrastructure, software, and hardware are applied effectively and are in alignment with the school's objectives (Almalki & Williams, 2012). The Ministry needs to increase awareness of the ICT policy in public schools to assist in planning and promoting the development of the school and its objectives and to ensure that principals and teachers understand and agree on the approach to use with ICT.

Factors Caused by the Principals

Lack of knowledge of modern technology. Implementing ICT is about change, and change requires strong principals. Principals need to understand the technologies and how they can be applied. It becomes a problem when the principals do not understand technologies. In this study, I found that most principals have limited knowledge of modern ICT. Through the interviews, I realized that the principals have a lack of understanding of modern of ICT tools. They believe that the SMART Board is the newest tool in education. Some of them think that presenting PowerPoint on a projector is an effective tool for teachers and students. When I asked them if their school has modern ICT, six of them answered yes, and they supported their answers

by sharing that their school has projector(s) and/or SMART Board(s). Teachers use projectors everyday and present their lessons through PowerPoint. Principals believe that PowerPoint is an effective, modern tool. Not one of the participants reported using any modern ICT tools, such as designing a blog/website, games, digital devices, app tools etc. Even though the education budget is high, principals only ask the Ministry of Education to provide projectors and SMART Boards.

Through the interviews, I have witnessed hard-working principals, with handful of them providing technology tools at their own expense. They assess teachers on the ability to use technology, and they also encourage their teachers to use the available technology. However, they need to be more aware of new technology in education. Through their answers, I realized that their knowledge of new ICT was limited. For example, I asked some of them about educational games, 3D learning, and other programs. They failed to provide sufficient responses. Few of them admitted that they are unaware of modern technology and how to apply technology in the classroom. Furthermore, when I asked the principals if there are electronic textbooks for students, not one participant reported yes. Instead, they all reported that only hard copies are available for students.

In the Ministry of Education website, there is a platform for proposing ideas related to education, training, technology, the Ministry of Education etc. The ideas that have received more votes will be considered the most important, and these will qualify for the decision-making process regarding which will be selected for implementation in the schools. Principals can share their thoughts on this platform. Unfortunately, none of the principals mentioned this resource or sharing of their ideas.

Principal A and B believe that their schools have the newest ICT tool, which is the SMART Board. Principal A sated that, "Even though I only have two SMARAT Boards in the school, I believe this tool is the most current one used in education." Principal B commented "I am lucky that my school has SMART Boards; it is the most effective tool in teaching and learning." Principals C's and D's opinions are that projectors are the most effective tools in teaching and learning. Principal C suggested that "My students love the projector in the classroom. They become interested when the lesson is presented on PowerPoint." Principal D explained that "When I attend a lesson for a teacher to assess her teaching, I prefer her to use PowerPoint because it is enjoyable for students to see something visually." Principal E admitted that she is not knowledgeable on the use of technology in school. "I took a course in the past to learn Microsoft Office, and I think it is enough to do my job." She felt does not feel confident in using technology both in school and at home.

Principal F expressed her experience with technology to me. She prefers using technology, but at the same time, she is afraid to use it because of a negative experience she had. She said that:

> Five years ago, I was using my phone while I was charging it. I charged my phone through an electrical outlet. On the electrical outlet were my charger, laptop, and speaker. Suddenly the electrical outlet caused a small fire in my room. After that, I become more cautious of using my phone or computer. I am afraid of this experience happening again in school, and because of this, I am not interested in technology.

Principal G admitted that she is only familiar with the projector and the SMART Board. She expressed her feeling toward using technology:

Using technology is helpful and useful for both students and teachers. The SMART

Board is the newest tool in school, and I see it as an effective tool. I have limited

knowledge of modern technology in education. I think the Ministry should provide

modern tools as well as training course for teachers.

Principal H's perspective is that technology is important and that students and teachers

should use computers. Lessons should be presented on projectors or SMART Boards, no matter

what methods the teacher uses. "I am glad that all the teachers use projectors and SMART

Boards in their teaching. These tools support education. Teachers can present their lessons

visually, and this increases student engagement."

School principals have a significant role in guiding the teaching and learning process,

initiating the use of ICT, and integrating it into teaching and learning. This role is significant in

helping educators create an ideal learning environment for pupils. Principals need to be aware of

modern ICT to able to integrate ICT into their daily practice. They need to understand, enhance

and perform the notion that ICT "integration is not about the technology; it is about focusing on

the future generations and leading teachers to a change in pedagogy" (Afshari, Abu bakar, Luan

& Fool, 2008, p.112). The Ministry needs to ensure that all school principals have adequate

knowledge of current ICT, and that they are knowledgeable of implementing them in school.

Beliefs. Beliefs are a main influencing factor in many fields of education and technology.

Principals' beliefs have an effect on the use of technology in school. In this study, I found that a

number of principals do not feel that technology can influence learning.

They believe that a traditional teaching method is better than using technology. They feel that the

older method is instilling information to students better than the new methods could. Students

can easily memorize information. Technology opens their minds, but students easily forget

information they memorize. Principal A pointed out her perspective "I prefer the old method

than technology. I don't like the projector, but students love it." She strongly agrees that the

traditional method is more effective and students can easier receive the information. She was

exited to explain her points, and she wishes teachers would go back to traditional method.

Principal B does not believe in the use of ICT in education. She has strong beliefs toward

IC; she believes that ICT is useless and ineffective. The principal's opinion was "Technology

can be waste of time and effort for teachers; I personally do not use technology all the time. I use

it when I need it, but education does not need ICT." Principal C expressed that the school does

not have much ICT tools, and not all classes have technologies. She thinks that it is unfair for

some students to use ICT whereas other students are not able to do so. Her opinion is that:

> The usage should be equal for all students and all classrooms. I feel sorry when some
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> students come to my office and complain about the lack of technology in school. I do
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> not believe that ICT is going to make a huge change in education, but my point is that
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> if the Ministry does not provide sufficient ICT tools, I do not see it is necessarily being
>
> used in the classroom.

Since the schools have limited and not efficient technology tools, principals feel that what

is currently available for teachers to use is ineffective for student learning. To support ICT use,

principals need to develop their visions of how school reform can be affected by the use of ICT.

They have to understand the potential advantages of ICT use in education and its effectiveness in

teaching and learning. The Ministry has to recognize that it is vital they understand the beliefs of

the principals in relation to education and ICT use.

Chapter Five: Discussion and Conclusion

The purpose of this Chapter is to highlight the major findings of the previous chapter and to describe the findings as related to the purpose of the research study. In this section, I address the research problem through discussion of the study's research questions

The most ICT tools used in school are SMART Boards and projectors. This differs from school to school. Some schools have more than one SMART Board whereas other schools have only one or none. Six of the target schools are using projectors everyday. The schools have been improving in the last five years. However, schools need sufficient ICT tools and proper infrastructure. Although there is a Saudi ICT educational policy, it is not well-communicated, implemented, or re-enforced. The problem still exists, but this study has discovered some of the main reasons that have caused this problem as well as improvements that have been made and that are in the planning phase.

The study has found through analysis of the data that there are two categories which have created barriers that impact the use of ICT in public schools. The first cause is the Ministry of Education as it is responsible for the entire education system, including lack of budget, lack of maintenance, lack of ICT tools, infrastructure, no clear vision, and curriculum. The barriers that are created by the principals, including beliefs and lack of knowledge of modern technology, can be reduced when the Ministry of Education guides school principals in improving education.

Through the interviews, most of principals who participated in this study hold the Ministry of Education responsible for not providing enough technology in education. Most of them have a positive opinion on ICT, and they hope that the Ministry's ICT policy will be updated. In their perspective, technology is important in school; most students use technology

daily at home. The principals continued that they feel sorry for students because students enjoy

when the lessons are presented on the SMART Board. They are aware of a communication

barrier with the Ministry. From the interviews, I found that some principals are willing to work

towards creating a strong relationship with the Ministry. They suggested ideas for

communication with supervisors who are responsible, such as individuals in the Maintenance

Department, Planning and Development Department, ICT Department, Curriculum Department,

and other related departments. Even though some principals do not have enough knowledge on

modern ICT, they were not satisfied with the current education system regarding ICT and active

learning.

On the other hand, the Ministry of education does not seek to reinforce its relationship

with the principals. The protocol of the Ministry regarding its relationship with the school

principals is strict. The Ministry sends supervisors once or twice a year to assess teachers'

performances. Moreover, all school administrators require the support of the Ministry of

Education regarding ICT tools and their maintenance service. However, both Ministry of

Education members in this study mentioned some of the improvements that have been done, and

they have discussed future plans that will lead to an improved education system. The plans are

related to the education budget, developing infrastructure, opening new schools, and improving

the quality of education by applying new ICT programs.

What are the roles of principals and the Ministry of Education in implementing ICT in schools?
What relationship exists between them?

Most School principals are encouraging and motivating teachers to use technology in

everyday classes. They assess whether or not a teacher uses technology, provide training inside

the school, and organize meetings to encourage teachers to use technology. Bonus points are given for this. Most principals are providing training on SMART Boards and projector uses in school. Expert teachers who use ICT have more experience applying technology in the classroom. These teachers help colleagues develop their skills once or twice a year. Most principals encourage expert teachers to organize schedules for other teachers based on their free time to help them learn more about SMART Board. Teachers are helping other teachers with ICT reinforces relationships and is cost effective. Teachers vary in the methods they use when applying technology as a tool in their teaching. Even though expert teachers can help fill the gap of the Ministry failing to provide its educators with ICT training, teachers still need to take courses for professional development, which includes courses on best practices to adapt ICT to teaching and active learning. When educators learn how to effectively employ ICT with learning in their teaching, students benefit. Students, as most principals claimed, are interested in learning with technology. They can be more active, motivated, and creative.

Some principals in this study encourage teachers who have limited knowledge on using SMART Board to attend in their colleagues' lessons to learn. Principals are also conducting class visits to assess teachers on their use of ICT in their teaching practice. Teachers who are utilizing technology receive a point, for example, in their assessment form. Since many principals care about technology, most of them have purchased projectors from their school's budget because the Ministry of Education has yet to provided them with enough resources for their schools. Some participants expressed that this situation is frustrating: several times a year they have to repair the damage done to the SMART Boards or projectors. They brought external engineers to do the maintenance when they felt the Ministry of Education is taking too long to provide them with a maintenance engineer. In their opinion, it is a waste of time to follow up with the Ministry

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for maintenance; they prefer to bring in an external engineer rather than asking the Ministry for help.

One of the principals spent 70,000 Saudi Riyal at her own expense for the school including tools, material, activities etc. Principals worked hard and found ways to provide projectors in schools. One of the principals organized a Bazaar every so often to earn money to buy technology tools for the school. All the principals that I interviewed are hard-workers who want to improve their schools; however, they need further knowledge about modern technology to make a huge change in school.

The Ministry of Education has improved in the last years. The education system has focused on student-centered learning rather than teacher-centered learning. Teachers can apply different teaching methods to support learning. The Ministry has encouraged teachers to apply an active learning method in their instruction. Some technology tools have been provided in most public schools, and the curriculum has changed for all grade levels (Almalki & Williams, 2012). The Ministry has been offering scholarships to many students to travel aboard to study different programs (Hilal & Denman, 2013).

One of the members of administration of the Ministry that the researcher interviewed announced that in the last ten years the Ministry of Education has spent billions on scholarships without strict monitoring. The rules have changed, and the scholarship is now not open to everyone and every program. That means the budget will be more managed than before, and that the Ministry of Education will have to consider more on school needs of technology. Moreover, the Ministry of Education has provided at least one SMART Board to most public schools, and

that is the first step in implementing ICT. It also has provided projectors, but some schools still have a lack of projectors and SMART Boards.

On the Ministry website, there is a section for Electronic programs. Under this section, there are 17 electronic programs for schools and universities. These programs are for technology use and for communication with members of the Ministry of Education. This section includes different programs that are helpful and useful for principals, teachers, and students. One of the programs is iEN (National Education Portal); this website provides online textbooks for all grades, allows students to attend online lessons with excellent teachers, and it includes educational videos explaining the lesson in interesting ways. Also, on the website, there is a program for proposing ideas related to education, training, technology, the Ministry of Education, etc. The ideas that receive more votes will be at the forefront of ideas, and they will qualify for a presentation to be made to the decision-makers. Principals, teachers, and students can share their thoughts through this website.

The Ministry of Education requires teachers to use technology everyday. The Ministry desires to develop the learning process, and boost modern teahing methods by involving teachers in using ICT in their classrooms to support the learning. The Ministry has sought to establish an active learning approach for learners to acquire a better education and to enhance students' motivittion, critical thinking skills and creativity. Also, the Ministry encoaurges their teachers to be creative in teaching by applying effective lessons with the use of ICT. It is a good idea to require teachers to apply technology everyday, but not all teachers are creative and effective in using ICT. The lesson may become boring even with technology because the teacher, fore instance, fails to follow an active learning approach or does not have enough ICT skills.

There is an assessment form that the Ministry of Education has created In the assessment form, there are items for using technology. The principals and supervisors are responsible for assessing teachers on this item. The Ministry of Education sends supervisors twice a year to assess teachers' performance. They also assess whether or not the teacher uses technology in their teaching.

Many rented school buildings and the infrastructure of these buildings are inappropriate for education. Rented buildings are ill-equipped for using different technologies (Al-Hattami Muammar & Elmahdi, 2013). In 2016, the Ministry of Education has started joining rented school students to owned government schools. The principals from the rented schools in this study commented that the Ministry of Education gives priority to owned schools by enhancing their buildings. The infrastructure in the rented schools is poor, and as a result, we have experienced power outages.

Principals claimed that the entire curriculum has been changed in all grades, but they mentioned, math and science are still heavy and hard. Even though the Ministry of Education has changed the curriculum, a limited number of improvements have been made on the integration of ICTs into the curriculum. A few schools have been using a program called Classera; the benefit of this program is that it provides an active connection between the student and the learner. There is a section for lessons, activities, homework, quizzes, email, online discussion rooms, material attachments, smart classes (online classes), and grades. In addition, this program has an online library, which includes pictures, documents, audios, videos, programs, educational games, educational websites, slideshows, and educational flash cards. Teachers and students can log in at the same time and work through the assignment together. Students can take online quizzes as

well as lessons. Students receive points for logging in, so this allows the teachers to know which students log in, and how often they log in. Also, there are different user roles, such as teachers, students, parents, and leaders. This program is a good step in implementing ICT in education.

Classera is the first e-learning system that has been implemented in private and public schools. The program aims to impact student learning by providing a means "for teachers to find new ways to allow students to learn at their own pace while encouraging peer interaction and increased parental involvement in learning" (Alahmari & Blankson, 2016, p.38). Classera equips students with various tools that allow them to access different sources. The program as a tool can foster critical thinking skills, creativity, engagement and motivation. Classera has different tools for e-learning, reading, watching videos, communication, and educational games. Teacher can encourage students to read several online resources in this program to help students critically evaluate and synthesize information and to improve their critical thinking, imagination, and reflecting skills (Stright, Dopkins & Yeo, 2014). This program supports online learning; teachers can offer lessons online through Classera. In addition, online discussions can foster socialization among peers. Games can help to encourage students' group work skills and interaction with classmates.

Educators can install educational games through Classera to promote students' engagement and motivation. Students can play games in groups, which can help to encourage their group work skills, interaction and engagement. Educational games do not just provide content knowledge, but they also improve creativity and problem solving skills (Al-Ali, Al-Shabatat, Fong, & Andaleeb, 2011). Teachers can install challenging games to foster critical thinking skills and creativity. According to Alahmari and Blankson (2016) some educators in their study

pointed out that using Classera has helped to boost their pupils' motivation to learn. It is also reported to have increased classroom participation and the quality of students' responses during class discussions.

Online quizzes are an assessment task that helps to provide feedback to the teachers, and expand students' knowledge (Morera, Azofra & Hernández, 2012). Educators can encourage group working and engagement through online quizzes. For example, instead of taking the quiz individually, group quizzes can be applied. On the other hand, quizzes are a low assessment task and their focus is usually on testing students' knowledge, not their skills. (Morera, Azofra & Hernández, 2012).

The Saudi government has employed financial resources to reinforce and boost learning. The government has been striving to ensure that all schools have access to various resources to implement ICT, including Classera. However, the use of Classera is still limited and only a few public schools are using this program due to the lack of ICT materials and limited Internet access in the classrooms. This program has not been provided to all schools (Almalki, Finger, & Zagami, 2013).

Most principals indicated that there is gap between the Ministry of Education and principals; there is no direct connection between principals and the Ministry of Education. Supervisors are mediators between principals and the Ministry of Education. These supervisors are for assessing teachers' performance and arranging meetings with principals if needed. In addition, there is an online communication program regarding requesting technology tools, maintenance etc. Although all participants agreed that the online communication is easier and faster than before, they are still endure from delayed responses, especially when the

communication focuses on requesting technology tools or maintenance. The Ministry of Education does not send supervisors to check on ICT tool needs in school. They send supervisors to assess teachers' teaching and teaching methods. One of the assessment items is using technology in class.

If strong relationships between the Ministry and principals are formed, open discussions regarding the needs of the different schools can take place. Principals of aware of what their school needs at any given time. As such, open communication can allow principals to address the party responsible for meeting that particular need. For example, principals can work with the ICT department and inform this department, which tools need to be replaced, which tools require maintenance, etc. Principals collaborating with the Ministry may provide insight to the Ministry as to which principals are leaders of their school and take the role of principal ship seriously.

Even though improvements in education have been made, much work is still needed; ICT policies need to be made clearer, mandatory ICT training for educators should take place, successful integration of ICT tools into the curriculum is needed, the gap between the Ministry and the principals needs to close, technology tools need to be implemented and maintained, work is needed on the infrastructure of the schools, and the budget needs to be re-evaluated.

ICT in Saudi Arabia public schools needs to be more available as a number of schools lack these tools. Although the principals feel that it is the responsibility of the Ministry to provide the schools with ICT tools, many of the principals in this study acknowledge that the Ministry has started to work on improving barriers that schools face. Some of the work the Ministry is making progress on includes building new schools, improving electricity, and providing electronic educational and communication programs.

What are the educational objectives for implementing technology in public schools in Saudi Arabia?

The Ministry of Education seeks to provide the opportunity for education for all in an appropriate educational environment in the light of the educational policy of the Kingdom of Saudi Arabia, raise the quality of its outputs, increase the effectiveness of scientific research, encourage creativity and innovation, develop community partnership and upgrade the skills and abilities of education personnel (The Ministry of Education, 2017). The Ministry strives to make the education stronger by applying these objectives. It has provided ICT tools to several public schools. There is still, however, a lack of ICT tools in schools. Most of the principals in the study stated that the Ministry of Education has raised the level of education and requires from teachers to apply active learning through ICT. The Ministry of Education requires teachers to have a Bachelor Degree to apply for teaching, as opposed to before when a High School Diploma would suffice.

Unfortunately, not all the objectives have been applied comprehensively in education. Through the principal interviews, it was revealed that the Ministry still needs to implement technology in all of its schools and that support for active learning should be provided. Teaching in many public schools becomes automatic when teachers are unable to use different tools or teaching approaches. They need modern tools and programs to be able to diversify their teaching. Additionally, teachers and principals need to be trained, and they need education on new technology, such as educational games, 3D learning, and other current ICT tools available. The objectives for implementing technology in public schools are:

1. Optimal recruitment of ICTs. The Ministry seeks to select the most effective ICT tools to use new ICT tools in education. These tools have to be tested and to be tested and piloted first in order to ensure that they are effective and that they will be able to support teaching and learning.

2. Raise the level of education outputs in order to meet the requirements of technology and development and the needs of society.

3. Develop criteria for teacher selection and qualification, and develop and stimulate their educational competencies including their ICT skills.

4. Raise and improve the quality of education by building and providing educational software and disseminate it to serve the educational process on the public and private sectors. Also, the curriculum needs to be changed so that teachers are able to integrate ICT into their everyday teaching practice, which will help to meet the needs of the students and allow for skills to be developed, such as problem-solving skills.

5. Expand the construction and maintenance of educational buildings and facilities including infrastructure and build new schools.

6. Provide a learning environment that is conducive to education, creativity and technology, based on the positive interaction between students and their teachers. It also allows students to have the personal skills that make them more ready for university studies.

7. Keep abreast of the development of technology and its authoritative potential in supporting the teaching and learning process through digital information.

One of the members of administration of the Ministry explained in details the Ministry's objectives. He mentioned that these objectives were recently updated He claimed that education, and society as a whole, is continuously changing, so we need to change our objectives too. The

Ministry does not want to fall behind but instead wants to keep up-to-date on the current trends and practices. Some of these objectives have been posted on the Ministry website, and the other objectives were explained by the member of administration of the Ministry. If all these objectives apply in education, then the education system will better serve students, teachers, and the education sector. These objectives meet the needs of students, teachers, principals, schools, and society. Students' different skills will improve and teachers' overall performance, especially their ability to use ICT, will strengthen. These objectives are going to affect schools. A positive school environment, with updated facilities, updated equipment, trained teachers, and modern technology can influence a student's success.

Although some of these objectives are posted on the Ministry website, there is no proof that the other objectives will be applied. All these objectives might be accurate, but there is no guarantee that the Ministry will apply them all effectively. Some of these objectives are placed on the website, but all schools in this study still report negative experience with ICT.

How does the Ministry of Education plan to ensure that technology is implemented in schools?

The members of administration have listed plans for improving ICT in education and implemented them in schools. Some plans have been started in 2017 and some plans will start after. They showed me some reports to prove that the Ministry determines to achieve these plans.

1. The Ministry of Education has launched a campaign to review and develop infrastructure and sought to expand the construction and maintenance of educational buildings and facilities.

2. Approximately 200 billion Riyal has been allocated to education for 2017. The budget includes new projects and additions to existing projects for educational complexes and schools' infrastructure and rehabilitation of existing facilities for schools.

3. In 2016, four hundred and eleven schools have been opened, and in the next two or three years, one thousand and three hundred and seventy-six complexes and schools will be opened.

4. Some rules have been changed and that for the benefit of the budget is including strict monitoring of scholarships, and the Ministry of Education wants to reduce rented schools as much as possible. So by 2017 and 2018, 50% of rented schools will be combined to the nearest government schools. As a result, the budget that has been arranged depends on its priorities, and this includes ICT, according to the members of administration of the Ministry.

5. Improving the quality of learning and teaching methods in partnership with Tatweer Company for Education Technologies and Classera for Intelligent e-Learning, so as to ensure the implementation and activation of the Classera program in the near term in a short period, not exceeding three years on several stages subject to evaluation and measuring the outcomes of their success to be applied in all schools.

6. The Ministry of Education website has been updated and electronic programs have been included in the website. These programs are for communication including distant communication and meetings, an online library, online posts that aims to convey scientific and educational messages in simple terms, and expressive images, in order to clarify the role of e-learning in the educational process and the potential that it can provide to achieve the objectives of learning in modern educational ways, graphs which

provide visual material that demonstrate important information on implementing ICT through visualizations that present complex information quickly and clearly. In the website, there is a center for qualitative initiatives, particularly for adopting and embracing specific qualitative initiatives, working on its sponsorship and planning in a scientific way through working groups, and supervising and implementing them. "Quality Initiative - Definition: It is a unique creative idea, and a vision that carries in its content changes the current situation and addresses its problems" (The Ministry of Education, 2017, p. 1).

Some of these plans have been accepted, and the Ministry of Education is still working on them. For example, Classera is a new project that the Ministry has implemented in education, but this project is still in process. The member of administration of the Ministry claimed that a few public schools have been using Classera. The program will be implemented in all schools over the next five year. One of the schools that I visited in this study was new. The standard of the infrastructure is in good condition, as the principal claimed during the interview. Ministry's website has improved; in the last five years the website has included new programs to serve the entire education sector including students, teachers, and principals.

These plans are going to positively affect the use of ICT in teaching and learning. When the issue of infrastructure is solved and ICT programs have been implemented using ICT in the teaching and learning will be efficient. ICT as a tool can help teachers to create more learner-centered learning environments, and this approach can help to foster the learning process. With a solid infrastructure, teachers can use ICT with no concern. Some of the benefits of opening new schools include the following: classrooms are equipped with tools and cables that support ICT

use, and buildings are designed to provide appropriate infrastructure for modern learning

methods.

Why is there insufficient support from the Ministry of Education when providing new technology in public schools?

Even though the education budget is high, there is an insufficient amount of ICT support

from the Ministry of Education. Most of the schools I have visited suffer from a lack of tools and

maintenance. The reasons for this, as participants mentioned, mistakes from some employees

could slow the work and a lack of sufficient supervisors that have knowledge and experiences

with modern ICT. The budget was not properly arranged, and the Ministry of Education pays

millions to rented schools, and billions has spent on scholarship without monitoring. The

Ministry of Education has not purchased educational and learning apps, sites, and games for

public schools; however, the Ministry of Education has been working to provide Classera in the

next three years. Lack of infrastructure is more common in schools renting their building causing

them several problems with electricity. As a result, not many ICT tools can be provided when

schools lack infrastructure.

The Ministry must take into consideration the challenges that hinder the technology

integration in Saudi schools. Furthermore, the Ministry must thoroughly investigate these

challenges and find ways to address them before implementing ICT tools. There are no effective

policies currently available. The Ministry needs to create new policies in regards to ICT in

teaching and learning. Schools need to have clear polices to follow.

Schools still have limited Internet access, and this can prevent teachers from using online

resource. This study's results demonstrate that most schools do not have access to the Internet in

classrooms. There are differences in the availability of ICT between old and new neighbourhoods. Old neighbourhoods lack telecommunications infrastructure and as a result, the schools in theses neighbourhoods encounter problems with using technology. There is a lack of training courses for teachers, and they need these courses to learn how to implement modern ICT into the curriculum.

The Ministry has not enforced its ICT policies in all schools. Some school principals pointed out that the Ministry's polices are unclear and poorly communicated; the Ministry requires teachers to use technology everyday but not in every class. The policy requires that teachers have to use technology, but the problem is that they can apply ICT everyday without integrating it into an active learning method. Technology may become ineffective when teachers use it with the traditional teaching methods. For example, educators can apply ICT in class by presenting their lessons on a projector. When teachers use only projectors for PowerPoint slides, their teaching method is outdated. Hence, the policies of implementing ICT have to support the student-centered method. Alahmari and Blankson (2016) stated that "The misguided policies and funding for technology use in education may fail to have the desired educational outcomes, while costing more than other education interventions if teacher perceptions of use, benefits, and challenges are not taken into consideration" (p. 89).

Active learning has become interactive learning; the Ministry has the ability to support differentiation by supplying teachers with a wide variety of ICT tools that can be fitted to the respective learning objectives. The schools need support in funding, resources, training, and infrastructure from the Ministry so that they can improve the schools system. Moreover, the Ministry can reinforce principals to complete ICT courses. Principals manage the school system;

thus, they need training to expand their ICT knowledge to help improve the school in general and teachers in particular. When principals have the knowledge, they can encourage the use of ICT; for example, using ICT to role-play in the resource room or provide technology for role-play outdoors. They can also ask new teachers to provide suggestions on applying technology. However, the Ministry has to make updates and changes to its ICT policy system and apply these policies in all schools to ensure that these schools implement ICT in their practice.

Conclusion

The researcher conducted the study related to a deficiency in the implementation of new technology in the Saudi Arabian public school education system. The results of this study reveal the barriers that impact on the adoption and use of modern technology in schools. The Ministry of Education and school principals have created these impediments. The Ministry has had limited success in implementing ICT, because some Saudi Arabian public schools still have unsuitable technological infrastructures, unclear ICT policies, deficiency in ICT tools, lack of financial support, shortage in maintenance, and heavy curriculum, especially in math and science. It is clear that schools will not completely benefit from using ICT unless all challenges are taken into consideration.

The impediments that were caused by the principals include: beliefs and lack of knowledge of modern ICT. These barriers could be minimized when the Ministry of Education guides school principals for everything related to modern ICT. The findings from this study have demonstrated that most principals are aware that there is a lack of communication with the Ministry. They agreed that the Ministry has not implemented ICT efficiently. All barriers that

hinder the integration of ICT in education and that prevent the effective use of ICT should be addressed.

School principals do not deny that the Ministry of Education has projects to improve and make a change in education. The Ministry of Education also has been working to minimize some of these impediments through opening new schools, providing electronic educational and communication programs, supporting ideas and projects related to technology and training. However, schools still have a deficiency in the implementation of modern ICT. Technology policies need to be clearer, training need to be mandatory, success in integration of ICTs into the curriculum, the gap between the Ministry of Education and headmasters needs to be closed; ICT equipment and maintenance needs to be provided to all schools, work needs to be done on the infrastructure, and finally, schools need to be supported financially. Therefore, while the short-term purpose of this study was to explore factors that influence the lack of technology implementation in public schools, the benefits and barriers that prevent schools from the effective use of ICT in public schools should continue to be explored from principals' and teachers' perspectives to ensure that the barriers are overcome.

Recommendation for Future Studies

In view of the results derived from this study, the following recommendations for policy and practice are suggested. They are fundamentally associated to the strategies that can be implemented by the Ministry of Education to ensure the success and the success of effective implementation of ICT in education.

1. The Ministry of Education should increase awareness of its educational policy in general and ICT policy in particular in all schools. To achieve this successfully, the Ministry

should distribute the Educational Policy Document to schools and requiring educators and principals to work towards achieving its objectives and to report any difficulties that they face by providing their own recommendations for solving these problems.

2. The Ministry should apply different methods to encourage educators to utilize ICT tools in their teaching to guarantee egalitarian learning opportunities for all pupils.

3. The Ministry should give school principals more authority and freedom in managing their schools including financial management.

4. This study indicated a need for more training opportunities. Hence, the Ministry should ensure that all educators receive sufficient training. Training courses should be in the form of continuous professional development courses. These courses should not only concentrate on basic ICT skills but they should offer techniques for merging ICT in teaching and learning. Moreover, the Ministry should provide supervisors for ICT use in all schools and make them responsible for ensuring that all schools have adequate tools and that the teachers are applying these tools effectively. The Ministry should offer ICT teachers with suitable and skills to train teachers on ICT and technical issues and to support them and meet their needs as well as the school's ICT needs.

5. The Ministry should ensure that all school principals have sufficient knowledge related to ICT and that they are aware of current ICT tools and how to implement these tools in the school. The Ministry should set meetings with school principals twice a year to discuss the school's needs and the effectiveness of modern ICT that is used and will be used in future.

6. ICT resources should be enriched in schools, and the software of ICT resources should be in Arabic language and based on school curriculum.

7. The lack of maintenance and technical support was regarded as a hindrance to ICT. To increase the use of ICT, the Ministry should provide maintenance and technical support to all schools to guarantee educators during their class lessons that their flow will not be interrupted when a technical issue arises.

The researcher hopes that this study will encourage other researchers to conduct follow-up research in the field of ICT in education, and they can build on this study's results to expand the literature in this area. ICT usage in schools is still in its early phase of implementation and further research should therefore be encouraged. For future studies, it may be interesting to conduct a similar study throughout the nation of Saudi Arabia including Tatweer schools. It could be helpful to compare the results between the education in Saudi Arabia and in the developed countries, so we can see the differences and perhaps benefit from learning the achievements of others. Also, some private schools are considered to be exemplary in implementing modern technology and applying different teaching methods. As a result, it would be useful to conduct a similar study on private schools to obtain knowledge on how modern ICT is applied, which will allow for the comparing and contrasting of the current study's findings. I would suggest for future studies to include special education in public schools and their use of ICT.

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Appendix 1: Interview Questions

Questions for the Ministry of Education Members

1. How many public schools currently use technology in their day-to-day activities?

2. What are the challenges facing the Ministry of Education in ensuring the use of technology in all public schools? How are they handling these challenges?

3. How do you measure the success of the project? What parameters are used to measure if the project is successful or whether some areas need improvement?

4. The Ministry of Education has the financial ability to send many students to study aboard. Why is the current level of integration of ICT lacking when the Ministry of Education has previously encouraged and invested in the use of ICT in public schools?

5. How many times the Ministry send supervisors to schools regarding ICT?
For what purpose?

6. Does having a new minister for the Ministry of Education lead to the release of new regulations regarding ICT integration in public schools, please explain?

7. In your view, how can the Ministry of Education improve the use of ICT in public schools?

8. What kinds of technology does the Ministry provide for public schools?

9. What are the Ministry's plans for integrating technology into the curriculum?

10. Does the Ministry provide modern ICT in all public schools? If yes, what do they provide? If no, why not?

11. Do teachers have the needed expertise in the ICT sector to help impart knowledge to students? What training programs have you provided for teachers and how have they worked out?

Questions for the School Principals

1. Has the school adopted the use of modern technology? If yes, what has it done?

2. What is the role of school administrators in enhancing ICT in schools?

3. How many times do teachers use technology per week? Are all teachers trained to use technology?

4. From your perspective, what are some of the most effective uses of technology for students?

5. In you view, what does the school need from the Ministry to improve ICT integration?

6. How fast is the Internet speed? When there is a technical issue, what do you do?

7. What do you do if you're missing ICT equipment?

8. How do you encourage teachers to use ICT?

9. How many times do you, as a principal, communicate with the Ministry? For what reasons?

10. When you report a problem regarding technology to the Ministry, how many days does it take for the problem to be resolved?

11. What kind of degree do most teachers have?

12. Since the introduction of ICT, have you noticed any significant improvements in student academics, explain please?

13. What are some changes that have taken place in the last few years in schools regarding ICT?

14. Modern technology has made teaching and learning easier for both staff and students. What style of teaching do teachers with more than 10 years of experience prefer? Why do they prefer that style?

15. What barriers hinder teachers' attitudes and limit their use of computer technologies in public schools?

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