A STUDY OF THE SOCIO-TECHNICAL INFLUENCES ON INFORMATION AND COMMUNICATIONS TECHNOLOGY IN GIRLS’ SCHOOLS IN SAUDI ARABIA

A Thesis in
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by
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ABSTRACT

The integration of Information and Communications Technologies (ICTs) in the classroom has shown to have many benefits. Consequently, educational authorities around the world have been pressuring schools and teachers to integrate ICTs into the classroom. The Saudi Arabian government began its ICT-related educational reform by providing resources, such as resource rooms with interactive whiteboards and projectors in classrooms, and mandating teachers to become ICT adopters. Unfortunately, few gains have been observed and many challenges have yet to be addressed. This study focuses on ICT adoption in Saudi Arabian girl’s schools and examines the challenges to the currently partial ICT integration and to the goal of full ICT integration.

To investigate ICT integration in schools, I conducted an interview-based study of teachers and school administrators in six Saudi Arabian girls’ public schools. My findings indicate that for Saudi Arabia to succeed in ICT integration in education, the government must first address the challenges to the currently partial ICT integration and then address the upcoming challenges for full integration of ICTs in the classroom. Factors that affect the currently partial ICT integration include: (1) formal training, (2) adequate resources, (3) awareness of value of ICTs, and (4) teacher evaluation. Full ICT integration creates challenges such as: (1) ICT curricula and ICT-pedagogy integration, (2) technical support, and (3) additional resources. Four different cultural insights were uncovered through this study: (1) effect of organizational culture on ICT integration, (2) effect of curricular differences between genders on ICT integration, (3) effect of perceived gender role on ICT integration, and (4) effect of social customs and traditions on ICT integration. The Saudi government must take into consideration the influence of culture as it attempts to integrate ICTs into the classroom.
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Chapter 1

Introduction

Researchers have found substantial evidence of the benefits of both partial and full integration of Information and Communications technology (ICT) in the classroom concerning student learning (Cox, Preston, & Cox, 1999). Most studies have shown positive gains in improving students’ learning outcome (Baker, Gearhart, & Herman, 1994; Kachala, 1998; Kulik, 1994; Schacter, 1999). Nevertheless, in spite of ICT projects, numerous training programs, and investments by schools in ICT resources, there has been a disappointingly slow adoption of ICTs in schools (Cox, Preston & Cox, 1999). However, before describing the full motivation for this thesis, I would like to, first, define a few important terms:

• Information and Communications Technology – These are software, and hardware tools such as, computers, interactive whiteboards and projectors, which can be used by teachers and students.

• Partial ICT integration – The integration of ICTs to aid conventional teaching. By conventional teaching, I am referring to the traditional teacher-centered instruction that emphasizes the use of lectures and demonstrations where students learn by listening and observing and are expected to memorize facts. There are many ways ICT tools can be used to aid conventional teaching. For example, teachers could use a laptop, PowerPoint, and a projector to present their material instead of writing on a chalkboard. Another example is the use of an online drop box instead of handing in material by hand.
Full ICT integration – The integration of ICTs (hardware, and subject specific software) into the students’ curriculum and everyday school activity. An example of full ICT integration could be providing each student with a computer and software that will teach him or her mathematical skills to complement the lessons given by the teacher.

There has been increasing demand for integrating ICTs into the class to improve learning and increase achievement (Kozma, 2003; Tubin & Edri, 2004). Teachers’ reactions have ranged from resisting ICT integration to partially integrating ICTs to fully integrating ICTs (Tubin & Edri, 2004).

Because national culture influences teachers’ perceptions and reactions, different nations need to address their ICT needs based on their specific cultural contexts (Albirini, 2006; Somekh, 2008). Saudi Arabia is an excellent example of a country that must take into consideration its strong cultural, traditional, and religious background when integrating ICT in the classroom. This is especially true when it comes to girls’ education. According to Amoudi and Sulaymani (2014), the application of technology in girls’ classrooms is more challenging than in boys’ classrooms in Saudi Arabia because of cultural beliefs.

The history of the Saudi Arabian girls’ education and the recent ICT related reforms are different than many other countries. Historically, Saudi girls’ education was delayed due to cultural beliefs (Amoudi & Sulaymani, 2014). Similarly, there is a delay in the adoption of ICTs in girls’ schools that may have resulted from cultural beliefs (Amoudi & Sulaymani, 2014).
The Saudi government has been making progress in its ICT related education reform, but the progress has been in the form of quantitative expansion on resources rather than qualitative reforms to curriculum and teaching methodology. They have started to move from the traditional teaching approach to partially utilizing ICTs by providing a limited amount of resources, such as interactive whiteboards and projectors, and mandating teachers to become ICT adopters (Alenezi, 2014). Unfortunately, few gains have been observed and many challenges have yet to be addressed (Alenezi, 2014). In addition, methods for teaching girls still focus on the traditional way of learning, based on listening, observing, and memorizing (AlMunajjed, 2009), instead of the new student-centered teaching approaches through full ICT integration. Full ICT integration has a lot of potential to improve education as it: (1) prepares students to operate technology in today’s workplace (Bingimlas, 2009; Yelland, 2001), (2) helps students develop skills, motivation, and knowledge (Grabe & Grabe, 2007), and (3) reduces teachers’ direct instruction, giving her or him more time to assist students with their needs (Iding, Crosby, & Speitel, 2002; Romeo, 2006; Shamatha, Peressini, & Meymaris 2004).

Many studies have been conducted on the topic of ICT integration in Saudi Arabian schools. The studies come in two forms: (1) interventions and trial studies on partial and full ICT integration in education (Al-Ahmad, 2007; Al-Otaibi 2003; Al-Dayel 2005), and (2) studies on the challenges to the currently partial ICT integration in education (Alharbi, 2013; Alenezi, 2014). At this time, few studies have investigated the challenges to both the currently partial ICT integration and the potential full ICT integration in the context of girls’ schools in Saudi Arabia.
This study aims at identifying the factors affecting the currently partial ICT integration, and the factors affecting the goal of full ICT integration in girls’ schools, and uncovering underlying cultural influences on ICT integration. In terms of the currently partial ICT integration, many challenges have yet to be addressed. The Saudi government needs to uncover and address the socio-technical challenges to the currently partial ICT integration. Also, full ICT integration is superior to the traditional teaching methods and partial ICT integration methods (Alharbi, 2013; Alenezi, 2014; and Al-Otaibi, 2003). Therefore, in order for the adoption of technology to progress, the Saudi government needs to uncover and address the challenges for future full integration of ICT tools. Because technology integration may be more challenging in girls’ schools than in boys’ schools (Amoudi & Sulaymani, 2014), suggesting that the challenges may differ, there is a need to look into the challenges in girls’ schools’ separately than boys’ schools.

These issues motivate this study’s main research question and sub research questions:

What are the socio-technical influences on ICT integration in girls’ schools in Saudi Arabia?

• What are the factors affecting the currently partial ICT integration?
• What are the factors affecting future full ICT integration?
• What are the effects of culture on ICT integration?

To investigate these questions, I conducted an interview-based study examining the perceptions of teachers and school administrators in six girls’ public schools in the capital of Saudi Arabia, Riyadh.
1.1 Organization of Thesis:

This thesis is structured as follows:

- In Chapter 2, I provide background on partial and full ICT integration in the classroom and an overview of the Saudi Arabian educational context, particularly related to girls’ education.

- In Chapter 3, I present the research approach, sample population, participants, data collection procedures, interview sessions, data analysis, and validity and credibility of the research.

- In Chapter 4, I discuss four questions to uncover the findings: (1) what are the teachers doing in terms of partial ICT integration? (2) Why are the teachers not partially integrating ICTs in their classrooms? (3) Why are the teachers partially integrating ICTs in their classrooms? And (4) what are the teachers’ and school administrators’ views on the challenges for the future full integration of ICTs in the classroom.

- In Chapter 5, I discuss the insights gained through this study. I also provide recommendations. Finally, I discuss the limitations of this study.

- In Chapter 6, I conclude by summarizing the key findings and discussing future research opportunities in this space.
Chapter 2

Literature Review

This chapter will provide background on partial and full ICT integration in the classroom and an overview of the Saudi Arabian educational context particularly related to female education.

2.1 Two Types of ICT Integration into Schools

Globally, teachers are being pressured into integrating ICTs into the class to improve learning and increase achievement (Kozma, 2003; Tubin & Edri, 2004). Their reactions have ranged from resistance, to partial integration of ICTs, to full integration of ICTs (Tubin & Edri, 2004). In the following sections, I discuss the two types of integration and provide some examples.

2.1.1 Partial ICT Integration in the Classroom

Partial integration of ICTs in the classroom includes digital projectors and interactive whiteboard (IWB) set up to aid conventional teaching. A projector projects the computer screen onto a larger screen for student viewing. The teacher can display web pages and slideshows, and show movies and photos using the projector. On the other hand, an interactive whiteboard is a large interactive display that can be controlled using a finger or a pen.

Projectors and IWBs differ slightly in terms of partial ICT integration. A projector is not very innovative; it is used to present material and thus focused on supporting teacher needs. IWBs, on the other hand, are student-and-teacher centric technology. If used appropriately, the IWBs are designed to allow teachers and students to solve
problems together in an interactive manner in front of the class. IWBs are meant to encourage student participation by getting students to approach the board and interact with it, whereas in a projector-only classroom, the teacher drives the technology and interaction.

Partial ICT integration is an improvement over no ICT integration and provides many advantages. Both projectors and IWBs can provide more teaching time because a teacher can use the resources more efficiently (Walker, 2003). Furthermore, IWBs can support interaction (Cox et al., 2003), cooperation (Painter, Whiting & Wolters, 2004), and discussion opportunities in the classroom (Levy, 2002). In addition, they are found to contribute to more concentration (Beeland, 2002; Kennewell, 2004; Solvie, 2004) and motivation (Levy, 2002; Longman & Hughes, 2006). Still, IWBs also have limitations. As Beauchamp and Parkinson (2005) explained, “clearly the IWB is a lot more exciting than the blackboard and overhead projector, and pupils will be curious to find out about its functions and capabilities. As a result, they may pay more attention than in the past. However, once the teacher has exhausted all the IWB routines, and the ‘wow’ factor has passed, these pupils may revert to less attentive behaviour.” (p. 97). Although students are found to be enthusiastic about the introduction of IWBs into their classrooms at first, the novelty and “wow” factor eventually wear off (Ball, 2003; Gray Gray, Hagger-Vaughan, Pilkington, & Tomkins, 2005; Levy, 2002; Moss, Jewitt, Levačić, 2006; Vandewyer, 2007).

For partial ICT integration to be successful, many factors need to be taken into consideration. Factors that influence IWB integration include resources, training, and support (Agterberg & Teeuws, 2007; Glover & Miller, 2002). Without the appropriate
resources, such as hardware and software, teachers cannot utilize IWBs appropriately. In addition, training and professional development are critical for IWB use to be successful (Fisser & Gervedink Nijhuis, 2007). Also, school culture and implementation strategy is considered one of the most relevant factors for successful IWB integration (Wiezeried, 2006). Finally, leadership and management support are also important factors that influence the successful adoption of IWBs in classrooms (Lee, 2004).

Although partial ICT integration is better than no ICT integration, partial ICT integration does not change the traditional dynamic. According to Kennewell (2006), “IWBs seem to reinforce traditional pedagogies. They do not in themselves afford learner autonomy in the way that laptop, or even desktop, PCs do” (p. 18). According to Nordkvelle and Olsen (2005), IWBs are made to fit ‘pre-existing instructional practices’. While partial ICT integration is somewhat beneficial for teachers and students, it seems to reinforce traditional pedagogies. Partial ICT integration is still mainly teacher-centric and is not learner-centric the way that full ICT integration is with the use of laptops and PCs. It does not promote new innovative teaching approaches the way full ICT integration can.

2.1.2 Full ICT integration in the Classroom

Full ICT integration can be achieved through the change of the traditional learning environment. The traditional learning environment motivates a teacher-centered teaching approach, while allowing students to use technology in their classroom may motivate a learner-centered teaching approach. Learner centered education allows students to more actively engage in the subject, enhance motivation, and enhance skills (discipline knowledge and collaborative and communication skills) (Lawrence & Deepa,
As Lawrence and Deepa (n.d.) explained, “ICT can be exploited to enhance the integration of the learning centered principles by supporting the learners and teacher’s need and capabilities while promoting creative and critical thinking” (p. 1).

There are three main reasons why full ICT integration is important: (1) to prepare students to operate technology in today’s workplace, (2) to help students develop skills, motivation, and knowledge, and (3) to reduce the teachers direct instruction, giving her or him more time to assist students with their needs. Yelland (2001) argues that the traditional learning environments do not teach students the skills needed to function or be productive in today's workplace. Many studies argue that student’s use of ICTs in the classroom can prepare them to operate in an information age (Bingimlas, 2009). Several studies have also concluded that ICT integration has great potential to enhance student achievement and teacher learning (Bransford, Brown, & Cocking, 2000). Not only does it help students develop skills, motivation, and knowledge, but it also reduces the amount of instruction given to them by the teachers, which in turn allows teachers more time to assist students with their needs (Grabe & Grabe, 2007; Iding, Crosby, & Speitel, 2002; Romeo, 2006; Shamatha, Peressini, & Meymaris 2004).

2.1.2.1 Relevant Studies on Full ICT integration

Kulik (1994) conducted a meta-analysis of more than 500 research studies of computer-based instruction. As Schacter (1999) explained, “Computer-based instruction software consists of tutorial, drill and practice, and more recently Integrated Learning Systems” (p. 4). Kulik (1994) highlighted the following positive findings:
On average, students who used computer-based instruction scored at the 64th percentile on tests of achievement compared to students in the control conditions without computers who scored at the 50th percentile.

Students learn more in less time when they receive computer-based instruction.

Students like their classes more and develop more positive attitudes when their classes include computer-based instruction. (Kulik, 1994, in Schacter, 1999, p. 4)

Although Kulik found many benefits of computer technology integration in the classroom, he explained that student achievement was not increased in all types of computer-based instruction in all settings. While some programs and practices work, others may have little to offer (Kulik, 1994). This may be due to the type of ICT tool, type of teaching approach, and extent of controlled variables in the study.

Similarly, Sivin-Kachala (1998) conducted a comprehensive review of 219 studies from 1990 to 1997. He found the following consistent positive findings:

Students in technology rich environments experience positive effects on achievement in all major subject areas.

Students in technology rich environments showed increased achievement in preschool through higher education for both regular and special needs children.

Students’ attitudes toward learning and their own self-concept improved consistently when computers were used for instruction. (Sivin-Kachala, 1998, in Schacter, 1999, p. 5)
In addition to these consistent positive findings, Sivin-Kachala also found that the level of effectiveness of education technology is influenced by many factors. These factors include: specific student population, the software design, the educators’ role, and the level of student access to the technology (Schacter, 1999).

In their study titled, “Evaluating the Apple Classrooms of Tomorrow”, Baker, Gearhart, and Herman (1994) assessed the impact of interactive technologies on teaching and learning in five school sites from third grade to ninth grade across the U.S. in partnership with Apple. Apple provided enough hardware so that each individual student would have a computer both at school and at home. The object of this research project was to make computers part of everyday school activity. Over the course of five years, the researchers focused on three main comparisons:

- ACOT students’ basic skills performance to nationally reported norms.
- ACOT students’ progress and achievement over time.
- ACOT teachers’ teaching practices. (Baker, Gearhart, & Herman, 1994, in Schacter, 1999, p. 5)

They discovered two major benefits:

- The ACOT experience appeared to result in new learning experiences requiring higher level reasoning and problem solving.
- ACOT did have a positive impact on student attitudes and did have an impact on changing teacher teaching practices toward more cooperative group work to less teacher standup lecturing. (Baker, Gearhart, & Herman, 1994, in Schacter, 1999, p. 5)
However, the authors also found that in standardized tests, ACOT students preformed no better than those who did not have access to computers (Baker, Gearhart, & Herman, 1994). The implications of these findings perhaps highlight the limitations of the technologies in impacting student outcome.

A study by Scardamalia and Bereiter (1996) investigated the use of the Computer Supported Intentional Learning Environment (CSILE). Scardamalia and Bereiter decided to design an environment in which students can use questions to guide their building of knowledge. Computer Supported Intentional Learning Environment (CSILE) was designed to support intentional learning. It is a networked system that provides students simultaneous access to a database that is composed of text and graphical notes that the students produce. The students used this system to ask questions, search for other students’ answers, comment, and review other students’ work. Eight years of CSILE research showed that:

- CSILE students surpass students in control classrooms on measures of depth of understanding, reflection, and also on standardized reading, language, and vocabulary tests.

Scardamalia and Bereiter (1991) recognized that question asking is an important part of the classroom and that students can produce and recognize educationally productive questions and can adapt them to their knowledge needs. CSILE allowed for the reframing of classroom discourse to support knowledge building. Computer technology can give
students access to great bodies of information that can prove to be very beneficial if used in constructing a knowledge building community.

Despite all of the benefits discussed above, there are some concerns about full ICT integration. Kulik (1994) explained, “no meta-analyst has reported that all types of computer-based instruction increase student achievement in all types of settings” (p. 27). Results of studies on computer-based instruction are not always consistent. Research also highlighted that there may be other factors that can affect the successful integration of ICTs.

2.1.2.2 Factors influencing full ICT integration in the Classrooms

In spite of numerous training programs and an investment by schools in ICTs, there has been a disappointingly slow adoption in schools. Although there are many factors involved in influencing the implementation of ICTs in schools, factors influencing teachers’ beliefs about teaching and learning with ICT are central to insure successful adoption. Mumtaz (2000) distinguishes three main categories of factors affecting teachers’ acceptance and use of ICTs: the school, the resources, and the teacher.

First, the organizational characteristics of the school impacts teachers’ decision to use ICTs in the classroom. Some schools do not give enough time for teachers to manage and familiarize themselves with the ICTs they will use (Robertson et al, 1999). In addition, schools provide little support for teachers who are not confident enough to integrate ICTs in their classrooms (Dupagne & Krendl, 1992; Hadley & Sheingold, 1993; Rosen & Weil, 1995; Winnans & Brown, 1992). According to Fullan (1991) and Cuban (1993) schools are slowing their adoption of ICT by resisting change. Schools do not feel the need to change since they are content with their familiar methods. This may be due to
the unclear understanding of what change to make and why this change may be necessary. A study by Stager (1995a, 1995b) presented an example of a successful intervention that included the following changes to effectively integrate computers in the classroom:

- Classroom assistance by trainers who were successful technology integrators
- Working alongside teachers to observe, support, evaluate and model computer integration.
- The school also offered:
  - A reduction in school pressures by offering off-site programs which focused on collaboration, personal reflection, sharing problems, sharing enthusiasm for learning with computers.
  - Financial assistance to help teachers purchase computers. (Stager, 1995a, 1995b, in Mumtaz, 2000, p. 336)

This successful integration showed that if the institution undertakes effective practices, teachers could progress towards comfortably using ICTs in the classroom.

Second, resources have a major impact on the teachers’ adoption of ICTs in the classroom. Limited resources (hardware, software, facilities, training) can hinder the successful integration of ICTs because they can limit what a teacher can do with the technology. Limited resources can result in lack of sufficient computer experience for both pupils and teachers (Dupagne & Krendl, 1992; Hadley & Sheingold, 1993; Rosen & Weil, 1995; Winnans & Brown, 1992). In order to insure successful integration, teachers need to be provided adequate facilities and training. In addition to facilities and training, teachers need to be provided with the appropriate software (Veen, 1993). Software
designers need to be able to provide an appropriate design that will help support different skills and ways of teaching and learning.

Finally, teachers play a crucial role in ICT adoption in the classroom. Veen (1993) highlighted how teachers outweigh institutional or school factors in regards to ICT adoption. Furthermore, Mumtaz (2000) stated:

“Despite essential technical support provided by the school and a positive attitude to IT from the school principal, the teacher factors that involved beliefs about the way the subject should be taught and skills associated with competence in managing classroom activities and computer-handling technical skills were the most influential in teachers’ use of computers” (p. 337).

Teachers who value their students’ learning and their own professional development will integrate computers in their classroom more easily (Becker, 1994; Becker & Riel, 2000; Hadley & Sheingold, 1993; Sheingold & Hadley, 1990). Similarly, teachers who value ICT and perceive that it is useful are more willing to completely transform their teaching from traditional pedagogy to an integrated one (Cox, Preston, & Cox; Pedretti, Smith-Mayer, & Woodrow, 1999). Another factor that has an impact on teachers’ decision to integrate computers in the classroom is the students’ expertise in computer use (Hruskocy Cennamo, Ertmer, & Johnson, 2000).

The studies described in this section all highlight similar factors that influence teachers’ decisions to use ICT in the classroom. These factors: the school, the resources, and the teachers, are all interwoven. The school can provide information and support which can help the teachers understand and recognize the importance of ICT adoption and thus find value in ICT and become more willing to completely transform their
teaching. The teachers would also need resources such as facilities, hardware, software, training to be able to successfully integrate ICT in the classroom.

### 2.2 Saudi Arabia

Today, ICTs are either being partially or fully integrated in schools around the world. Because teachers’ perceptions are often influenced by their national culture, different nations need to address their ICT needs depending on their specific culture (Albirini, 2006; Somekh, 2008). Saudi Arabia is an excellent example of a country that must take into consideration its strong cultural, traditional, and religious background when integrating ICTs in the classroom. This is especially true when it comes to girls’ education. According to Amoudi and Sulaymani (2014), the application of technology in girls’ classrooms is more challenging than in boys’ classrooms due to cultural beliefs.

The Saudi Arabian educational system, ICT adoption history, and cultural implementation factors are different than in other countries and may have an impact on factors influencing the adoption and acceptance of ICT. In this section, I will briefly describe the Saudi educational system, history of technology adoption, trial interventions of ICT integration, and cultural implementation factors.

#### 2.2.1 Saudi Arabian Educational System

The Saudi Arabian educational system began in the early 1900’s, and is currently under the jurisdiction of the Ministry of Education. Primary education consists of six years with students starting first grade at age six. Intermediate education lasts three years. Finally, secondary education lasts three years (Table 1). Similar to any educational system, the main goal of the Saudi educational system is to teach knowledge and skills to
its students. However, there is a significant religious component to the Saudi educational system. One of it’s main objective to instill and teach the Islamic beliefs to its students (Saxena, 2009). As Alenezi (2014) explained, “Islamic culture dominates all spheres of life”. Alenezi (2014) explained that the hours of religious subjects ranged from 14 to 35 percent. Although boys and girls are given equal rights to an education, they study in separate schools because of Islamic law.

<table>
<thead>
<tr>
<th>U.S Educational System</th>
<th>Grade Level</th>
<th>Saudi Educational System</th>
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<tbody>
<tr>
<td>Elementary School</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; - 5&lt;sup&gt;th&lt;/sup&gt; Grade</td>
<td>Primary Education</td>
</tr>
<tr>
<td>Middle School</td>
<td>6&lt;sup&gt;th&lt;/sup&gt; Grade</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7&lt;sup&gt;th&lt;/sup&gt; - 8&lt;sup&gt;th&lt;/sup&gt; Grade</td>
<td>Intermediate Education</td>
</tr>
<tr>
<td>High School</td>
<td>9&lt;sup&gt;th&lt;/sup&gt; Grade</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10&lt;sup&gt;th&lt;/sup&gt; – 12&lt;sup&gt;th&lt;/sup&gt; Grade</td>
<td>Secondary Education</td>
</tr>
</tbody>
</table>

Table 1. U.S and Saudi Educational System (Levels Comparison)

2.2.2 Overview of Girls’ Education

Around 1926, Saudi Arabia established the Education Directorate to supervise the education of boys, but it was not until 1959 that the government started making changes to educate girls. The Saudi customs and traditions played a huge role in delaying education for girls (Smith & Abouammoh, 2013). Women were seen as the housekeepers and mothers. Slowly, the Saudi culture began accepting the idea of women’s education. Today, there is a much higher emphasis on girls’ education. Women are the majority of the students in higher education (Khan, Hasan, & Clement, 2012) and are becoming a big part of the workforce.
The Saudi government has been making progress toward achieving gender equality among school students. According to Almunajjed (2009), the percentage of budget allocation for girls’ education exceeded the boys’ education. The problem is that the progress has been in the form of quantitative expansion on infrastructure, school buildings, hiring large numbers of teachers, and issuing a loaded curriculum rather than qualitative reforms to curriculum that minimize the gender gap by providing the girls with the skills needed for the current labor market (AlMunajjed, 2009).

2.2.3 Technology Subjects in Saudi Arabian Schools

As a result of the information revolution and the growth of the technology industry, computers began to play a key role in professional and educational life in the country. Accordingly, in 1996, the officials in the Ministry of Education in Saudi Arabia began developing curriculum for technology to be taught as a single subject in schools. Computer labs were provided in schools so that students would be trained on the use of computers.

This new subject was adopted around 1998 (Al-Dayel, 2008). The computer course was first developed for secondary education, and then eventually extended to intermediate education. The computer course was taught once a week for intermediate education students and then increased to two days per week for secondary education students. The course content included history of the computer and its components and training on the use of software for drawing and word coordination. Students were also trained on the use of electronic spreadsheets and databases. Students in their final year of secondary education were taught programming skills using BASIC language (Al-Dayel, 2008).
At the start of the program (i.e. 1997/1998), there were almost no teachers with the computer background to teach these classes. The computer courses were not mandatory in college, with the exception of the two areas of science and mathematics. The Ministry of Education recognized this issue and addressed it by introducing the computer course as a mandatory within all departments in college, in addition to opening a new degree in Computer Education. This decision was implemented around 1997/1998 in universities in three major cities: Riyadh, Jeddah, and Dammam (Al-Dayel, 2008).

Al-Dayel (2008) conducted a study examining the procedures that were followed in introducing the computer to schools in Saudi Arabia. These procedures included teacher training and establishing and equipping laboratories. His study showed that although all of the schools were located in the same city, Riyadh, different schools had different numbers of resources and facilities available to them. Al-Dayel (2008) explained, “extent of availability of the computer sets in the schools ranged from (3-89) sets, and the extent of the availability of the computer laboratories ranged from (1-5) labs” (p. 2). Most schools (90.7%) reported that they had 3 computer labs and 67% reported they had 20-30 computer sets (Al-Dayel, 2008). The study also found that a very small number of schools reported that most of the teachers in their school received training on the use of computers, programming, and educational software. In addition, the results showed that the teachers were dissatisfied with the resources they had including the facilities and the extent and quality of available computer sets. Al-Dayel (2008) concluded by identifying a set of needs:

- The need to provide adequate numbers of qualified teachers to teach computer materials.
• The need to hold training courses for teachers of computer.

• The need to produce educational software in the Kingdom of Saudi Arabia in cooperation with the Center of Education and Saudi IT departments in universities and colleges.

• The need for further studies on teachers’ perceptions and attitudes towards issues related to the use of computers in classroom teaching. (Al-Dayel, 2008).

While technology has been used in schools for a number of years now, the Ministry of Education is still working to overcome many issues.

2.2.4 Partial and Full Integration of ICTs in the Classroom: Trial and Intervention Studies in Saudi Arabia

Saudi Arabian researchers began designing interventions and trial studies to blend technology and classroom learning. The trials conducted examined the effects of both partial ICT integration and full ICT integration.

Al-Ahmad (2007) conducted a study on partial ICT integration in a Saudi Arabian School. The main goal of this study was to find the effects of the display of course material through the use of PowerPoint presentations on 6th grade girls' learning. The students were split into two groups, the first group were taught using the traditional teaching approach (writing on the chalkboard) and the second using the technology-aided teaching approach (PowerPoint presentation). The results of the study indicated that students who were taught using the PowerPoint presentation received higher averages in their test-based assessment than students who were taught using the traditional method.
The study emphasized the importance of visualization such as pictures and audio on student's learning outcome.

Al-Otaibi (2003), conducted a study aimed at identifying the impact of the use of full ICT integration in a classroom in Saudi Arabia. The goal of the study was to identify the effect of computers in an English class for second grade students in Riyadh. The researcher split students into a control group, taught the traditional way, and an experimental group, taught the same content with the help of computer software. After two weeks, the students’ achievement was tested. The study showed that although there was no statistical significance, the average scores of the experimental group was higher than that of the control group. The lack of statistical significance may be due to other factors influencing the effectiveness of the computers used in this study.

Similarly Al-Dayel (2005) investigated the effects of computer use in the acquisition of mathematical skills. The study consisted of 40 second grade students from Riyadh, Saudi Arabia. The students were randomly assigned to two groups, the control group, who were taught the traditional way, and the experimental group who were taught using a computer. The study concluded that the experimental group outperformed the control group.

### 2.2.5 ICT Related Educational Reform in Saudi Arabia

Recently, the Ministry of Education has been working to more closely integrate technology into learning. They started by implementing ICT-related education reform in Saudi Schools (Alenezi, 2014). The ongoing reform has mandated all teachers to become ICT adopters. This reform created new learning opportunities for students by providing teachers with ICT resources such as interactive whiteboards, projectors, documentary
cameras, and laser printers. Because of the lack of sufficient resources, most schools have only partially integrated ICT tools, to aid conventional teaching in terms of presenting material, instead of fully integrating ICT tools into their subject curricula. Although some steps have been taken to integrate technology in the classroom, few gains have been observed and many challenges have yet to be addressed (Alenezi, 2014).

2.2.6 Barriers to Successful ICT Integration in Saudi Arabia

Alharbi (2013) found that there are two types of barriers that impact teachers' use of technology in the classroom. The first type is the "first-order barrier" which is external to the teachers and includes resources, training, and support. The second type of barrier is the "second-order barrier" which is internal to the teachers and includes teachers' confidence, beliefs about how students learn, as well as their perception of the value of technology in the teaching and learning process.

Alenezi (2014) found that while ICT implementation is becoming mandatory, the implementation is not successful for the following reasons:

1. Saudi teachers do not feel they have administrative support, since this support, when it is available, is not sufficient.
2. They are rarely praised or rewarded for their ICT-related initiatives.
3. There is no well-defined conception of a teacher that is capable of integrating ICT into a subject domain.
4. There is no coordination and collaboration in a school setting concerning ICT uses. (Alenezi, 2014)

Alenezi (2014) explained that teachers do not have the support and resources to successfully integrate ICT tools into their classroom. Although some teachers have been
using ICT tools such as interactive whiteboards and projectors to help them move from a more traditional method of presentation and explanation because they were mandated, many teachers believe that they are successful without using ICT tools. These teachers do not see the potential of ICT tools and think they do not need ICT tools to become successful. This may be due to a lack of awareness of the value of ICT integration. In addition, many teachers have not yet started to integrate ICT into their subject domain. Since the schools are not yet equipped with the appropriate resources, the ICTs are merely used as a way to aid conventional teaching. Unfortunately, the reform failed to motivate teachers to develop an integrated pedagogy. Alenezi (2014) explained that merely mandating the use of ICT may impede ICT integration. ICT tools need to be understood and appropriate resources, support, and supervision needs to be provided.

2.2.7 The Effect of Saudi Arabian Cultural Influences

The Saudi Arabian cultural implementation factors may have a significant effect on the adoption of ICTs in the classroom. There are different types of culture related implementation factors that need to be taken into consideration: (1) culture of teachers, (2) cultural view on women’s role, (3) culture’s view on ICT integration in girls’ education, and (4) the difference between cultures in urban and rural areas.

2.2.7.1 Culture of Teachers

In terms of the culture of teachers, Saudi Arabia has a tradition of teaching, which allows teachers little freedom and initiative (Alenezi, 2014). Saudi teachers are trained to obey instructions given to them by educational authorities.
2.2.7.2 Cultural View on Women’s Role

Until 30 years ago, Saudi Arabia could be described as ‘the society of men’ (Smith & Abouammoh; 2013). According to Smith and Abouammoh (2013), this is because men “monopolized professional work as well as all kinds of political, economic, and social authority” (p. 118). Women played the role of the housewife and mother. Education for girls was delayed because of the cultural and religious beliefs in Saudi society. Slowly, this image changed, with women now making up a larger percentage of the students in higher education (Khan et al., 2012). Some women are now in important roles as doctors, university professors, and businesswomen.

2.2.7.3 Culture’s View on ICT Integration in Girls’ Education

According to Amoudi and Sulaymani (2014), the application of technology in girls’ classrooms is more challenging than in boys’ classrooms due to cultural beliefs. Amoudi and Sulaymani (2014) stated:

“The Islamic law is more accommodating to the boy child than the girl child is. There are regulations that govern the behavior of women that includes dressing and all the factors that are exposed to the women. The technology involves the use of the internet and other resources that may be prohibited in Saudi Arabia” (p. 15).

This issue may slow down the implementation of technology in girl’s classrooms and makes it more difficult to implement the technology.

2.2.7.4 Difference Between Cultures in Urban and Rural Areas

Another factor that affects the implementation of educational technology in schools is the area of the country. The views on women’s role and girls’ education differ
from urban to rural areas. In addition, Implementation is noted to be faster in urban areas because of the change in mentality due to globalization (Amoudi & Sulaymani, 2014). The urban population has a perception that women have more freedom in their activities. In urban centers, some women even fight for their rights concerning morality and education (Amoudi & Sulaymani, 2014). In rural areas of Saudi Arabia, the citizens are more traditional and strict in their thinking. This is the same population that resisted girl’s education and only accepted it once it was forcefully implemented by the government (Jiffry, 2013). As Amoudi and Sulaymani (2014) explained,

“The girls in this society are subject to many outdated rules. They believe that a girl is supposed to behave well waiting for her marriage. Any technology is not allowed as it is seen as a form of western civilization loathed and prohibited by the populace” (p. 16).

Many believe the use of this technology will lead to immoral behavior (Amoudi & Sulaymani, 2014).

2.3 Chapter Summary

This chapter provided background on partial and full ICT integration in the classroom and an overview of the Saudi Arabian educational context particularly related to female education. In the next chapter, I explain the research methodology used in this study.
Chapter 3
Research Methodology

This chapter will discuss the research approach, sample population, participants, data collection procedures, interview sessions, data analysis, and validity and creditability of research.

3.1 Research Approach

I used qualitative methods in this study for several reasons. A qualitative methodology allows a researcher to explore the issue at a deeper level. In this respect, I used interviews to collect data because the main goal of this study was to understand the teachers’ and school administrators’ perceptions about teaching and learning with ICTs. Kvale (1996) defined qualitative research interviews as "attempts to understand the world from the subjects' point of view, to unfold the meaning of peoples' experiences, to uncover their lived world prior to scientific explanations" (p. 1). Having a semi-structured approach to interviewing allows for a list of predetermined questions but at the same time, provides the interviewees the freedom to bring in other topics or issues that may be relevant to the study. This is why I believe that using qualitative methods were appropriate for this exploratory study.

3.2 Sample Population

The sample population was teachers and school administrators from six girls’ public schools in the capital of Saudi Arabia, Riyadh. This sample was chosen because it
allowed the researcher to gain a deep understanding of the specific underlying factors that would influence the teachers’ use of ICTs in the girls’ classroom.

### 3.3 Participants

The participants were 22 teachers and administrators from six different Saudi Arabian girls’ public schools in the capital of Saudi Arabia, Riyadh (Table 2). The researcher first gained permission from the principal, then the principal recommended teachers or administrators for the researcher to interview depending on their availability.

<table>
<thead>
<tr>
<th>School Type</th>
<th>Participant Type</th>
<th>Participant Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>School 1 (Secondary Education)</td>
<td>Teachers</td>
<td>T1, T2, T3, T4</td>
</tr>
<tr>
<td>School 2 (Intermediate Education)</td>
<td>Teachers</td>
<td>T5, T6, T7, T8, T9, T10</td>
</tr>
<tr>
<td>School 3 (Primary Education)</td>
<td>Vice Principal</td>
<td>A1</td>
</tr>
<tr>
<td>School 4 (Secondary Education)</td>
<td>Teachers</td>
<td>T11, T12, T13, T14</td>
</tr>
<tr>
<td>School 5 (Intermediate Education)</td>
<td>Administrators</td>
<td>A2, A3, A4, A5</td>
</tr>
<tr>
<td>School 6 (Secondary Education)</td>
<td>Teachers</td>
<td>T15, T16, T17</td>
</tr>
</tbody>
</table>

Table 2. Participants

### 3.4 Data Collection Procedures

Before any data collection took place, I gained permission from the Saudi Arabian Ministry of Education to conduct the study. The goal was to conduct interviews in 6 schools, but as a precaution, I asked for permission to conduct the research study in 7 different schools in the capital of Saudi Arabia, Riyadh. See Appendix B for Ministry of
Education’s approval. The Ministry of Education also approved the interview questions (Appendix D) and provided a letter to be presented to the schools to ease the researchers task (Appendix C). The study was conducted over the course of two months near the end of the 2013-2014 school year.

In order to gain a deep understanding of the perceptions of teachers and school administrators of the integration of ICTs in classrooms, I conducted 30-45 minute semi-structured interviews. In addition to hand written notes, I also audio recorded the interviews. Of the twenty-two participants, eight participants did not want to have the interviews recorded because of personal and cultural reasons. In those cases, I made sure that my notes were particularly detailed.

### 3.5 Interview Sessions

First, I gained consent from the participants. After that, the participants were introduced to the study. After getting permission to record the session, I began the interview. The questions were semi-structured, therefore, they were not asked word for word, but rather used as a guide of the themes that were to be explored (Appendix D).

The first set of questions were asked to get an understanding of the currently partial ICT integration in schools. The questions investigated the type of work the teachers and administrators do and their experiences using technology.

Then, a collaborative information retrieval tool, SearchTogether, was introduced and demonstrated via video to give the teachers an idea of a tool that they can possibly use to integrate technology in their classroom. The design of SearchTogether was in part informed by studies of students in grade school and in university that “have observed that
joint information retrieval occurs in such settings, as students often work together on team projects and assist each other with strategies for locating relevant information online or in library databases” (Morris & Horvitz, 2007, p. 2). SearchTogether was chosen for its simplicity, flexibility, and the fact that it can possibly cover all subject areas.

Finally, the second set of questions were asked to gain an idea of the perceptions of the teachers and school administrators of full ICT integration, using a tool such as SearchTogether or a similar tool. They were asked to express their thoughts regarding its integration and its challenges.

3.6 Data Analysis

I used Renner and Tyler-Powell's (2003) analysis process. The first step is to get to know the data. All of the data was first transcribed. Then, the texts were read several times and any first impressions were written down while going through the texts. The next step was analyzing by organizing the data by topic and looking across all of the answers to identify consistencies and differences. After that, the next step was categorizing the information. Themes and patterns were identified and organized into categories. Then, patterns and connections within and between the categories were discovered. The final step is interpretation, attaching meaning to the findings. Because I am fluent in the Arabic language, I did not translate any of the transcriptions or notes until the analysis was finished. The themes, connections, and quotations were translated to English and used to explain the findings. Figure 1 illustrates how I used Tyler-Powell and Renner's process to generate themes.
3.7 Validity and Credibility

To ensure the validity and credibility of this thesis, both reflexivity and member checking were utilized. The next sections discuss reflexivity and member checking.

3.7.1 Reflexivity

Reflexivity is a form of self-disclosure. As Malterud explains, "a researcher's background and position will affect what they choose to investigate, the angle of investigation, the methods judged most adequate for this purpose, the findings considered
most appropriate, and the framing and communication of conclusions" (Malterud, 2001, p. 483–484). Because the perspective of the researchers shapes the research, it is important to disclose the background and any preconceptions of the researcher.

I, the principal investigator, am a Saudi Arabian female. Having come from the Saudi Arabian culture, I understand the cultural context. But, I have also lived and studied in the United States for the past 13 years and consequently, because I’ve lived in different cultures, I believe I have a broad view of culture and socio-technical issues. My perspectives and knowledge from scholarly readings formed my interest in this investigation. I began this investigation with the intention of helping to improve ICTs in Saudi Arabian schools. Before conducting the interviews, I disclosed to the participants that I am a Saudi Arabian student with the interest of improving ICTs in Saudi Arabian schools. This allowed the participants to classify me as an insider, which facilitated trust and engagement. Other than what I had read in the previous scholarly works, I did not know what to expect from a socio-technical standpoint. I learned about the socio-technical influences and made connections to previous research as I went through the interviews.

3.7.2 Member Checking

Member checking was used to improve the credibility of the results. This technique was also used to get feedback and decrease the chance of misinterpretation of the data. Member checking is described as being “the most crucial technique for establishing credibility” (Lincoln & Guba, 1985, p. 314). The interpreted results of this study were presented to a group of 4 Saudi Arabian teachers and school administrators.
The group responded to the findings by explaining that through their experience, they could see how the findings came to be.

3.8 Chapter Summary

This chapter discussed the research approach, sample population, participants, data collection procedures, interview sessions, data analysis, and validity and creditability of research. In the next chapter, I present the findings of this study.
Chapter 4

Findings

In this chapter, I present the findings from this study which focus on understanding ICT integration within the context of the Saudi Arabian girls’ schools. The findings are presented in the form of the questions: (1) what are the teachers doing in terms of partial ICT integration? (2) Why are the teachers not partially integrating ICTs in their classrooms? (3) Why are the teachers partially Integrating ICTs in their classrooms? And (4) what are the teachers’ and school administrators’ views on the challenges for the future full integration of ICTs in the classroom.

4.1 What are the teachers doing in terms of ICT integration?

In terms of ICT integration, the teachers’ responses indicate that teachers are either: (1) not integrating ICTs in the classroom, or (2) partially integrating ICTs in the classroom.

4.1.1 Not Integrating ICTs in the Classroom

6 of the 22 participants stated that either they or their colleagues refused to use technology in the classroom and were not ICT adopters. They identified themselves or their colleagues as older, and have been out of school for a long time. They also did not receive any training on how to integrate ICTs into the classroom.

“You approach old blood. I suffer, not just from this [problem]. I suffer, they go about everything traditionally” “For us, anything new, they reject it because it’s new” (A1)

“We [my colleagues and I] graduated from college more than 15 years ago. We are not familiar [with the topic of technology]...” (T1)
There are several reasons for their refusal to change. Some of the reasons are lack of training, and lack of awareness of the value of ICT integration. These reasons will be discussed in full detail in the “why” section.

4.1.2 Partially integrating ICTs in the classroom

Most participants identified themselves as partial ICT adopters who used ICTs as a form of aid to conventional teaching. In this study, the only form of aid used is the presentation aid to conventional teaching using interactive whiteboards and projectors. 10 out of the 22 teachers stated that they had access to a resource room (with an interactive whiteboard and a computer), projectors for every classroom, limited Internet connection, and software that was provided by the Ministry of education.

“We have a resource room that has a computer and we have recently received projectors for every classroom.” (T.12 Teacher)

“We have a room in the school named the resource room. This room has a board named a smart board. It is controlled by touch, like an iPhone. It also has a computer. You can access Internet. The schools usually have 2 resource rooms. I can take my students to this room, but my school only has one...” “For me, it [ICT tool] has saved an effort from talking and the students were more excited because there is audio and picture.” (T.10 Teacher)

By explaining that the benefit gained from the integration is reduced workload in terms of presentation, and increased motivation of students because of the audio and visualization features that projectors provide, the teacher implied that the ICT tool served as a form of aid to conventional teaching in terms of presentation of material. Teachers partially integrated ICTs for several reasons including: evaluation requirements, and awareness of value of ICTs. Those reasons will be discussed in full detail in the “why” section.
4.2 Why are the teachers not partially integrating ICTs in their classrooms?

6 of the 22 participants indicated that they or their colleagues did not partially integrate ICTs in their classroom at all and went about teaching the traditional way. The findings indicate that the two main factors that delay the adoption of partial ICT integration are: (1) lack of formal training and (2) lack of awareness of ICT’s value.

4.2.1 Lack of Formal Training

The findings indicate that while some teachers could do without formal training because they could rely on their colleagues’ help, two categories of teachers were in desperate need of adequate formal training. First, those who were new to the school were not familiar with their colleagues; therefore, they may have been uncomfortable asking them for help. Second, those who were older and have been out of school for a long time were unfamiliar with the technology; therefore, they found it harder to learn from their colleagues’ informal instruction.

“You approach old blood. I suffer, not just from this [problem]. I suffer, they go about everything traditionally” “For us, anything new, they reject it because it’s new” “If I was responsible in the Ministry of Education, before they [the teachers] apply, they have to have a certificate from the ministry of at least 6 months [of training]... she will have the basic skills I don’t want her to be an expert but the basics.” “We are women, we have circumstances, therefore take her 5 months, train her.” (A1)

“We [my colleagues and I] graduated from college more than 15 years ago. We are not familiar [with the topic of technology].” “We are very new to the school” (T1)

“We didn’t benefit from training but from each other’s experiences... There are teachers who are used to something and do not want to try something new. In terms of age, for those who are older, it’s more difficult to adjust... There are still people using the traditional methods because truly there is not enough training and secondly there are people who still fear trying anything new.” (T10)

The lack of adequate mandatory formal training causes a fear of technology and slows the adoption of ICTs.
4.2.2 Lack of Awareness of ICT’s value

Another reason why teachers were not partially integrating ICT into their teaching approach is due to the lack of awareness of the value of partial ICT integration. Those teachers did not utilize the technologies available to them because they did not understand their uses and benefits.

“There are people who are close-minded. They see that these tools will be distracting for them and that there are other [traditional] ways of doing the same thing. ” (T10)

They believed that the traditional way of teaching offers the same benefits and consequently, they refused to change.

4.3 Why are the teachers partially Integrating ICTs in their classrooms?

Most participants indicated that they and their colleagues at least partially integrated ICTs into their classroom. There were two factors that affected this decision: (1) evaluation requirements and (2) awareness of ICT’s value.

4.3.1 Evaluation Requirements

The teachers are required by the Ministry of Education to be technology adopters. This is incorporated as part of their evaluation. Their principal often encouraged them to use ICTs in the classroom and evaluated them on that basis as well.

“Not all teachers are enthusiastic [about the integration of technology]. Some may not know how to use it at all. But, they are required [by the Ministry and the principal] to use the technology. So, eventually they ask for help from each other...” “For example, the teacher was going to be evaluated by the principal and was required to use technology in the classroom. I trained her how to use a projector and I helped her prepare a lesson then she presented in front of the principal...” “Of course this technology has helped us a lot. Of course at first the teachers found it difficult because they did not provide training. I may take training courses outside [of the school]. In some schools, like our school, for example, the Principal conducted an informal three-day training course.” (T10)
“In the beginning [of technology integration], one is somewhat uneasy, but then acquires the skill.” (T11)

The teachers were motivated to integrate ICTs because of the evaluation requirement. This motivation pushed them through their challenges. Because they were not provided with formal training, the teachers often sought help from each other and eventually learned how to use the ICT tools.

4.3.2 Awareness of ICT’s Value

Some participants indicated that they were motivated to partially integrate ICTs in their classrooms because they saw value in the use of ICT tools. The initial use of ICTs may or may not have been triggered by the fear of teacher evaluations, but the teachers’ understanding of the value of ICTs motivated them to continuously use ICT tools even when resources were not made available to them by the school.

“Our school doesn’t have [projectors in every room]. Every one of us teachers has purchased her own projector because there is only one resource room and it is usually reserved. I bought my own projector that I can take from class to class…” “For me, it has saved an effort from talking and the students were more excited because there is audio and picture.” (T10)

6 participants indicated that at their school, once the teachers had used the tools and experienced their benefits, including workload reduction and student motivation, they went as far as purchasing their own resources (projectors and computers) to partially integrate ICTs in their classrooms.
4.4 What are the teachers’ and school administrators’ views on the challenges for the future full integration of ICTs in the classroom?

Since the teachers did not have access to enough resources for a full integration of ICTs in their classrooms, they were asked about their views on the subject. 15 of the 22 participants were enthusiastic about this subject. 7 of the 22 participants were cautious and pessimistic. It was clear through the findings that most of the teachers saw the potential of the full integration of ICT tools, but were quick to explain that there are many challenges that need to be addressed before full ICT integration can be successful.

The participants identified four main challenges to full ICT integration: (1) training and awareness of value, (2) ICT curricula and ICT-pedagogy integration, (3) technical support, and (4) resources (hardware and software).

4.4.1 Training and Awareness of Value

The findings suggest that the biggest challenge is the lack of training and awareness of the values of full ICT integration and its uses. Both of these items were mentioned previously as affecting the adoption of partial ICT integration. Full ICT integration is even more complex, requiring more extensive training and motivation.

“The school can be prepared, but the people do not want this, they want tradition. The technology services us. If one knows how to make the best use of it, that’s it.”

(A1)

The participants insisted that regardless of the resources available, the teachers themselves have to understand the value and uses of ICTs to be motivated to use them.

4.4.2 ICT Curricula and ICT-pedagogy Integration

Teachers not only need to understand the benefits of fully integrating ICT tools into their subject curricula, but they also need to be provided with new ICT-integrated
curricula and they need to have a clear understanding of how to facilitate effective ICT-pedagogy integration.

“Sometimes, they flip it [the ICT tool] in a way. I don’t know if you have gotten the point or not, I mean for chatting and downloading pictures of parties of someone. There has to be monitoring” (T11)

“There has to be rules and regulations before the tool can be used.” (T9)

The findings show that the teachers emphasized the need for monitoring, suggesting that they fear they may lose control of the classroom. They also referred to rules and regulations and concerns with time suggesting the need for guidance.

When asked if anything can impede the integration of ICTs, one teacher explained:

“The class period itself is 45 minutes and [the technology] is not arranged for a class.” (T10)

These issues mentioned by the teachers indicate their need for control and guidance in terms of the new innovative practices, such as time allocation and specific student activity, which needs to be imbedded into new pedagogical goals and subject curricula.

4.4.3 Technical Support

In addition to the training needs mentioned previously, teachers and administrators alike explained their need for technology support.

“I wish that they would provide in all schools, a person in charge of the resources [ICTs]. And not one, at least two” (T10)

Here, the teacher explained the need for an information technology (IT) person in charge of supporting teachers in all IT related issues.

4.4.4 Resources (Hardware and Software)

The last challenge that needs to be addressed for the successful implementation of full ICT integration is the availability of appropriate resources. The need for adequate
hardware and software is an obvious point, but there is also the point of appropriate software design.

“I feel that if it was in Arabic, we can use it more innovatively.” (T4)

“The most important thing is that it is flexible, clear…” “But any program that has information sharing, or something, must be provided only academically for academic research and benefit…” “Sometimes, they flip it [the ICT tool] in a way, I don’t know if you have gotten the point or not, I mean for chatting and downloading pictures of parties of someone. There has to be monitoring” (T11)

Participants explained the need for software that incorporates their national language. In addition, they explained the need for flexibility and clarity indicating their concern with ease of use. Finally, the teachers mentioned monitoring; suggesting that they fear they may lose control of the class. Participants were also especially cautious when it came to the features of ICT tools that may violate their customs and traditions. Participants expressed caution when it came to introducing girls’ to technologies that were not designed for academic purposes, as it may expose them to non-academic information that may or may not be socially acceptable. Also, a feature, such as a video feature, was not received well by the participants. When asked about her thoughts on a possible video feature on ICT tools, one teacher explained:

“Our society doesn’t allow this. I feel that it is very difficult. We have customs and traditions we can’t go beyond.” (T3)

Teachers may not be comfortable using a video feature due to their customs and traditions. Appropriately designed software, that is subject specific, and takes into consideration social norms, can help teachers become more comfortable using the technology and maintaining control over the learning environment.
4.5 Chapter Summary

In this chapter, I discussed the findings of this study. The first section described what the teachers were doing in terms of ICT integration. In the second section, I explained why the teachers who did not identify themselves as ICT adopters are not integrating ICTs in their classrooms. I then described why the other teachers, who identify themselves as partial ICT adopters, are partially integrating ICTs in their classrooms. Finally, I explained the teachers’ and school administrators’ views on the future full integration of ICT in the classroom. The next chapter will describe the insights gained from these findings.
Chapter 5
Discussion, Recommendations, and Limitations

In this chapter, I discuss the implications of the findings, I provide recommendations for policy makers in the Ministry of Education, schools, and teachers, and I explain the limitations of this study.

5.1 Discussion

This study was guided by one central research question: what are the socio-technical influences on ICT integration in girls’ schools in Saudi Arabia? The research question is split into three sub-questions which will be used in this section to help explain the insights gained from this study: (1) what are the factors affecting the currently partial ICT integration? (2) What are the factors affecting future full ICT integration? And (3) what are the effects of culture on ICT integration? The first section is aimed at discussing what the factors affecting the currently partial ICT integration are and why they are important to recognize and address. The second section is focused on discussing the factors affecting full ICT integration and why they are important to identify and address. Finally, the last section is aimed at explaining the underlying cultural influences to ICT integration.

5.1.1 What are the factors affecting the currently partial ICT integration?

The Saudi government began incorporating technology in education in the form of partial ICT integration. They started by providing resources such as resource rooms,
projectors, and interactive whiteboards and mandating teachers to become ICT adopters. Unfortunately, they are only in the beginning of the ICT related educational reform and are still struggling to successfully partially integrate ICTs into the classroom. There are many factors influencing the success of partial ICT integration: (1) training, (2) resources, (3) awareness of value, and (4) teacher evaluation.

5.1.1.1 Training

The findings in this study suggest that training is a major hindrance to successful ICT integration. It seems that training was expected to come from the Ministry of Education. When the Ministry did not provide formal training, the schools either took initiative by providing informal training sessions, or did not make an effort at all because in their point of view that was the responsibility of the Ministry of Education. This lack of training lead the teachers to seek help from their colleagues. Unfortunately, those who could not cope with this limited amount of training were uncomfortable with partial ICT integration.

Formal training is important for partial ICT integration because without it, teachers either cannot use the resources available to them or cannot utilize them effectively. For example, in the case of projectors vs. interactive whiteboards (IWBs), some argue that they offer the same benefits. This depends on whether the teacher is trained on how to best utilize IWBs. Without formal training, teachers may end up using IWBs the same way they use a projector, to present material, and thus not realize the added benefit of IWBs. Studies have recognized training as a factor that influences partial ICT integration, especially interactive whiteboard integration (Agterberg & Teeuwes, 2007; Glover & Miller, 2002).
5.1.1.2 Resources

Participants often mentioned the availability of resources as an important factor to the successful integration of ICTs. While some schools reported to have a projector in every classroom, others did not. Also, some schools reported to have two resource rooms (with interactive whiteboards), while others only had one. This resource problem is commonly identified in research as one of the largest hindrances to partial ICT integration (Agterberg & Teeuwes, 2007; Alharbi, 2013; Glover & Miller, 2002).

Resource availability is important because the extent to which ICTs are integrated into the teaching method depends, in part, on the type of resource provided. When the ICT tool being used is a projector, it is generally a simple form of partial ICT integration, used to aid conventional teaching in terms of presentation only. IWBs are potentially more innovative in terms of partial ICT integration because of their collaborative capability, which allows for more teacher and student interaction. Unfortunately, IWBs are rarely used because they are located in the resource room, which is crowded and must be reserved per class period. It is unclear whether or not the IWBs are used appropriately. The teachers may be using the interactive whiteboards the same way they use the projectors, merely for presentation of class material. Only a small number of teachers have tried using the interactive whiteboards. Those teachers have only recently received the interactive whiteboards, suggesting they may not have acquired the skills necessary to effectively use these tools on their own because formal training was not available. Consequently, the students whose teachers only had access to projectors or have only recently received interactive whiteboards and do not know how to utilize them appropriately, may not benefit from partial ICT integration as much as students whose
teachers had access to interactive whiteboards and acquired the skills necessary to use them effectively. Students in different schools, who are exposed to different ICT resources, may not be exposed to the same added benefits that ICT integration provides.

5.1.1.3 Awareness of Value

The teachers’ value of ICT in the teaching and learning process is another barrier to successful partial ICT integration. The teachers were often unaware of the value of ICT integration because they were not properly introduced to ICTs. They were never given formal workshops on the value of integrating ICTs into the teaching and learning process; thus, this lack of awareness caused a lack of appreciation of the importance of ICT integration. Teachers, who did not see the value in integrating ICTs, did not make an effort to do so. Meanwhile, teachers who found value in integrating ICTs pushed through their challenges and went as far as getting training from their colleagues and purchasing their own resources. Studies by Alharbi (2013) and Alenezi (2014) also recognized awareness of value as a significant barrier to the successful integration of ICTs. Teachers who value their students’ learning and their own professional development can integrate computers in their classroom more easily (Becker, 1994; Becker & Riel, 2000; Hadley & Sheingold, 1993; Sheingold & Hadley, 1990). Similarly, teachers who value ICT and perceive that it is useful are more willing to completely transform their teaching from traditional pedagogy to an integrated one (Cox, Preston, & Cox, 1999; Pedretti, Smith-Mayer, & Woodrow, 1999).

5.1.1.4 Teacher Evaluation

The findings indicate that the educational authorities are not the main factor influencing the teachers’ decision to use ICTs, but rather the teacher evaluation and
assessment conducted by the educational authorities. Even when the teachers did not feel enthusiastic about integrating ICTs in their classroom, and did not have the proper resources and training to do so, they found a way to use them because of their evaluation process. The evaluations forced teachers to become ICT adopters regardless of their challenges. According to Stronge (2005), a teacher evaluation system is designed to encourage improvement. It is designed to encourage both the teacher being evaluated, and the school. However, even though the evaluations motivate change, they sometimes encourage change for which teachers have not been trained. Using teacher evaluation as a way to encourage ICT integration is about pressuring teachers to do something that they have not been trained for and may not agree with because it is one of the evaluation categories. Teacher evaluation is especially important when it comes to implementing new educational reform (Stronge, 2005), but in this system, reform is imposed on teachers without a training system that is consistent with each evaluative measure. Thus, although teacher evaluations are recognized as a powerful motivator, the Ministry of Education needs to consider both their strength and weakness when applying them to teacher practice.

5.1.2 What are the factors affecting future full ICT integration?

In order for the implementation of full integration to be successful in the future, there is a need to address the potential challenges that could affect this integration. Because full ICT integration is more difficult than partial ICT integration, the findings suggest that in addition to the previous factors and challenges (training, resources, awareness of value, and teacher evaluations) found in partial ICT integration, more
challenges emerge in full ICT integration which include: (1) ICT curricula and ICT-pedagogy integration, (2) technical support, and (3) additional resources.

5.1.2.1 ICT Curricula and ICT-Pedagogy Integration

The findings suggest that teachers and administrators are concerned with the challenges of the new ICT-pedagogy integration. They emphasized their need for guidance and worried that they may lose control of the classroom. Here, control is a pedagogical issue. Teachers do not have a well-defined understanding of the integrated-pedagogy. When teachers talked about losing control of the classroom, they talked about monitoring students to keep them from getting distracted, but they did not recognize how these tools might create a different learning environment in which students are embarking on self-directed learning that teachers are overseeing, instead of delivering content. The technology promotes a student-centered learning environment, which focuses on both the students and the instructor. According to Lawrence and Deepa (n.d.), in student-centered learning, students can talk without constant instructor monitoring. This challenge was not prominent in partial ICT integration because it seems to reinforce traditional pedagogies and teacher-centered approaches. Full ICT integration promotes new innovative teaching approaches. It requires tools (hardware, and subject specific software) to be used as a part of the students’ curriculum and everyday school activity. Alenezi (2014) agreed that teachers in Saudi Arabia do not have a well-defined understanding of how to integrate ICT into their subject domain. Due to the complexity of the new integrated pedagogy, there is a need for changes in curriculum content and goals to guide the teachers and better support integrated ICT pedagogy practices (Voogt & Pelgrum, 2005).
5.1.2.2 Technical Support

Because the technology in full ICT integration is more advanced, the participants reported that constant support is necessary. This support is in the form of an individual specializing in IT resource support. During partial integration, teachers often sought help from their colleagues. When it comes to full ICT integration, students and teachers alike may experience issues with software and hardware. In this case, seeking help from colleagues is not possible. Previous studies have explained that the most detrimental factor influencing the teachers’ adoption of full ICT integration is support. Research indicates that schools provide little support for teachers who are not confident enough to integrate ICT in their classrooms (Dupagne & Krendl, 1992; Hadley & Sheingold, 1993; Rosen & Weil, 1995; Winnans & Brown, 1992). In addition, in the context of Saudi Arabia, Alharbi (2013) explained that confidence with technology is one of the biggest barriers to ICT integration. Providing support may help the teachers become more confident and decrease their fear of technology.

5.1.2.3 Additional Resources

In addition to the obvious need for hardware, appropriate software design is also necessary. The findings indicate that many teachers specifically expressed their concern over the design of the ICT software in terms of its ease of use. Davis, Bagozzi, and Warshaw (1989) also found that ease of use affects people’s intentions to use computers and accept technology. In addition, the findings indicate that teachers were concerned with the software in terms of control of the learning environment. Therefore, the software needs to be designed to fit the integrated pedagogy and the specific subject matter. These findings are consistent with results of previous studies. Sivin-Kachala (1998) explained
that the level of effectiveness of educational technology is in part influenced by the software design. Veen (1993) also explained that teachers need to be provided with the appropriate software. Software designers need to be able to match what the teacher teaches and how they teach it with the appropriate design. The design must help support different skills and ways of teaching and learning.

5.1.3 What are the effects of culture on ICT integration?

It is important to understand that the factors and challenges to ICT integration discussed previously exist, in part, due to the cultural forces that shape girls’ education and women's status not only in education but also in society in general. In this section, I will discuss four insights gained on the effects of culture on ICT integration: (1) effect of organizational culture on ICT integration, (2) effect of curricular differences between genders on ICT integration, (3) effect of perceived gender role on ICT integration, and (4) effect of social customs and traditions on ICT integration.

5.1.3.1 Effect of Organizational Culture on ICT Integration

The educational domain in Saudi Arabia is very autocratic, top down, and driven by authority. The Saudi schools in this study have little initiative. They are required to follow the instructions given to them by the Ministry of Education. The school teachers and administrators believed that the challenges of ICT integration are not their responsibility, laying the blame on the Ministry of Education. The participants believed that the Ministry of Education holds all of the power and control because it is responsible for and expected to provide orders, guidance, support, training, and resources.
5.1.3.2 Effect of Curricular Differences Between Genders on ICT Integration

The Ministry of Education’s policy regarding the role of technology in women’s education differs slightly than their male counterparts. Participants in this study indicated that technology is not valued at girls’ schools, especially in terms of computer classes. Schools are not equipped with computers at the primary level and girls do not use the Internet. At the intermediate and secondary levels, the use of computers in girls' schools is reported by researchers to have only started about ten years ago and to a lesser degree than in boys’ schools (AlMunajjed, 2009). Instead, religious studies and the Arabic language subject dominate girls’ curricula at the primary, intermediate, and secondary levels. Unfortunately, information technology is lagging behind. When compared to the boys’ curriculum, the girls’ curriculum also lacks administration and business studies, accounting, general activity, physical education, and national education. AlMunajjed (2009) explained that “The curricula in girls’ schools stress courses that are suitable for the social and biological function of a woman in a traditional society and to prepare her to do what suits her “nature” (i.e., maternity)” (p. 12). The views of policy makers in the Ministry of Education on women’s roles in society are reflected through the type of curriculum they provide to girls, which limits their potential for progress during a period that is increasingly oriented towards technological advancement. In addition, it pushes them towards non-technological specializations, such as education and teaching, human sciences, natural sciences, and Islamic studies that do not correspond to the needs of the labor market (AlMunajjed, 2009).
5.1.3.3 Effect of Perceived Gender Role on ICT integration

The findings indicate that the perception of a woman’s role may influence the teachers’ and administrators’ integration of ICTs in the girls’ classrooms. A vice principal explained that she believes that women have “circumstances” referring to their responsibilities in their role as mother and wife. She explained that because they are women, they do not have time to deal with issues, such as providing training to teachers, which they believe is the responsibility of the Ministry of Education. She believed that this challenge goes outside of the scope of her job, and thus may possibly interfere with her responsibilities outside of the job. According to AlMunajjed (2009), “The Saudi Universities Law, the Civil Service Law, and the Labour and Workers Law treat women the same as men with regard to specific considerations such as grade, salary, curricula, opportunities in education, employment, and training, as long as they are consistent with the Shari’a law that is the basis of Saudi law” (p. 8). However, the patriarchal system and the local norms, traditions, and social beliefs, limit women’s ability to complete their work responsibilities beyond the scope of their job. This issue is linked to gender disparities and the traditional roles of men and women in society.

5.1.3.4 Effect of Social Customs and Traditions on ICT Integration

There are specific norms, traditions, social beliefs, and principles that affect the integration of technology into the classroom. Participants in this study expressed their concern with the impact of technology exposure on culture in two different examples: (1) exposing themselves to certain technology features may expose them beyond what is socially acceptable, and (2) exposing their students to nonacademic information may lead them to view or share information that is socially unacceptable.
Specific technology features such as video, for example, caused worry among the teachers because they were cautious about what’s socially acceptable. Women in Saudi Arabia are expected not to go out in public without an abaya (full-body covering). In Riyadh, some women also wear a niqab (veil). Girls’ schools operate as a safe place where women can uncover. Thus, Saudi women fear that in incorporating machines with video capability in schools, they may be exposed to technology that may expose them to the public.

The teachers in this study are concerned with Internet openness; however, in this conservative context those fears carry a different kind of cultural meaning. Exposing students to such technologies in schools may give them the ability to view and share information that is socially unacceptable. This worry is related to other kinds of cultural ideas about how outside influences can affect individual character. Similarly, Amoudi and Sulaymani (2014) explained that some Saudi citizens believe the use of this technology will lead to immoral behavior.

5.1.3.5 Summary of Cultural Influence

It is important to understand that the factors and challenges to ICT integration discussed previously may exist due to the social and political forces that shape girls’ education. Though cultural factors are important, they were not as obvious to the participants as non-cultural factors. Process and technology related factors, such as teacher evaluations, training needs, and lack of resources, were more evident to the participants. These factors were directly and easily linked to the party responsible for providing these items, the Ministry of Education, rather than the social culture of the
country, which is imbedded in the participants and the policy makers at the Ministry of Education. It is also important to recognize the globalization of the region in which the study was conducted. The views on women’s role and girls’ education differ from urban to rural areas. In addition, implementation is noted to be faster in urban areas because of the change in mentality due to globalization (Amoudi & Sulaymani, 2014). Therefore, while the results of this study imply significant cultural factors, other studies conducted in rural areas may show different results.

5.2 Recommendations

This section will discuss recommendations for: (1) policy makers in the Ministry of Education, (2) schools, (3) and teachers. In order to achieve effective partial ICT integration and plan for future full ICT integration, teachers, school administrators and policy makers in the Ministry of Education need to make some changes to address the challenges.

5.2.1 Policy Makers in the Ministry of Education

The Ministry of Education is responsible for providing support, resources, training, and incentives for change (teacher evaluations). For the currently partial ICT integration, the Ministry of Education should work to provide: (1) formal workshops to help teachers understand the value of ICT integration, (2) formal training, (3) up to date hardware and software, and (4) more specific evaluation criteria to encourage teachers to use ICTs more effectively. For future full ICT integration, the Ministry should provide: (1) new fully integrated subject curricula and goals, (2) new assessment frameworks, (3) new policies concerning full ICT integration in the classroom, (4) formal training and
workshops to help teachers understand the integrated pedagogy, and (5) ICT support resources such as appropriate hardware and subject specific software that accommodates cultural norms, IT support personnel, and high-speed Internet connection. In addition, the Ministry of Education should work to minimize the gender gap and provide girls’ with curricula and skills needed for the current labor market.

5.2.2 Schools

Schools need to make an effort to provide support and collegiality. Research has shown that school support is one of the main factors influencing the teachers’ adoption and successful integration of ICT (Mumtaz, 2000). While the Ministry of education is responsible for most support provided to the schools, the schools need to understand that when support, such as training, becomes unavailable, it is their responsibility to make an effort in providing it. Schools need to take initiative when challenges arise. In addition, the schools must provide a supportive network for teachers who are not confident with the use of ICTs in the classroom.

5.2.3 Teachers

Teachers need to make an effort to understand the value of the current ICT integration and the future full ICT integration. Teachers who value their students’ learning and their own professional development will integrate computers in their classroom more easily (Becker, 1994; Becker & Riel, 2000; Hadley & Sheingold, 1993; Sheingold & Hadley, 1990). Also, teachers who value ICT and perceive that it is useful are more willing to completely transform their teaching (Cox, Preston, & Cox, 1999; Pedretti, Smith-Mayer, & Woodrow, 1999).
5.3 Limitations

There are two main limitations to this study: school type and school region. In terms of school type, the schools studied in this study were only girls’ schools. This was done to get a better focus on the challenges in this specific context as it may differ from a different context. Of course this may limit the generalization to only girl’s schools. Another limitation is the school region. It is recognized that the region in this study, Riyadh, is more globalized than rural areas, which may result in different findings.

5.4 Chapter Summary

In this chapter, I discussed the implications of the findings, made recommendations, and clarified the limitations of this study. In the next chapter, I conclude this thesis by discussing the findings and describing this thesis’ contributions.
Chapter 6

Conclusion

Schools around the world are partially or fully integrating Information and Communication Technologies (ICTs). Different countries need to take into consideration their specific cultural context when integrating ICTs. Saudi Arabia is an excellent example of a country that is in the midst of its ICT related educational reform. While many studies have investigated challenges to ICT integration in Saudi schools, this study focuses specifically on girl’s schools and differentiates challenges to the currently partial ICT integration and the future full ICT integration.

The Saudi government began incorporating technology in education in the form of partial ICT integration. They started by providing resources such as resource rooms with interactive whiteboards and projectors and mandating teachers to become ICT adopters. Unfortunately, few gains have been observed and many challenges hindered the success of ICT integration (Alenezi, 2014).

For Saudi Arabia to move toward successful technology integration in education, the government must start by addressing the challenges to the currently partial ICT integration. My findings indicate that merely providing a limited amount of resources to teachers is not enough to ensure the successful integration of ICTs. Adequate formal training needs to be given to all teachers. In addition, teachers need to understand the value of ICTs in teaching and learning. Finally, the Ministry of Education must recognize the power of teacher evaluation. The fact that the Ministry of education is mandating the teachers to be ICT adopters by incorporating it as an item in their teacher evaluation has
given the teachers motivation to use ICTs, but without adequate training, the evaluation may not achieve the intended goals.

While partial ICT integration is somewhat beneficial for teachers and students, it seems to reinforce traditional pedagogies. Partial ICT integration is still mainly teacher-centered and is not learner centered the way that full ICT integration is with the use of laptops and PCs. It does not promote new innovative teaching and learning methods the way full ICT integration does.

In order for the adoption of technology to progress, there is a need to uncover and address the future challenges for the full integration of ICT tools, as researchers found them to be superior to the traditional teaching methods and partial ICT integration methods (Al-Dayel, 2005; Alenezi, 2014; Alharbi, 2013; Al-Otaibi, 2003). My findings indicate that because full ICT integration is rather complex, in addition to the challenges discussed previously (training, resources, awareness of value, and teacher evaluations), new challenges arise. Teachers need to be provided with new integrated curricula and they need to understand how to facilitate effective ICT pedagogy integration. Because the technology is more advanced, constant IT support is necessary. Also, software must be designed to fit the teachers’ needs in terms of ease of use and subject specific requirements.

The Saudi government must also take into consideration the implications of its culture on ICT integration. Four different cultural insights were uncovered through this study: (1) effect of organizational culture on ICT integration, (2) effect of curricular differences between genders on ICT integration, (3) effect of perceived gender role on ICT integration, and (4) effect of social customs and traditions on ICT integration.
In order to achieve effective partial ICT integration and plan for future full ICT integration, teachers, school administrators, policy makers in the Ministry of Education, and researchers in the field of ICT and education need to make some changes to address the challenges discussed. The teachers need to work on understanding the value of ICT integration in teaching and learning. The school administrators must provide teachers appropriate support and collegiality. Lastly, the Ministry of Education needs to provide appropriate training, resources, and support.

This research study has shown that the factors that may influence the integration of ICT in the classroom are worth investigating further. First, a large-scale study should be conducted to understand the perceptions of teachers and school administrators for both girls’ and boys’ schools across the country, as the results may or may not differ slightly due to gender or region. In addition it is recommended that researchers in education work in coordination with IT specialists in Universities, Colleges in Saudi Arabia, employees in the department of Curriculum and Instruction in the Ministry of Education, to develop the appropriate subject specific software that accommodates the cultural norms. Finally, when the full integration of ICT in the classroom is implemented across the country, researchers need to conduct a large-scale study throughout the country investigating and evaluating the full integration through observations as well as interviews with teachers after they had experienced the full integration of ICT in the classroom.

This thesis has four main contributions aimed at furthering the understanding of ICT integration in Saudi Arabian girls’ schools. First, the findings help to better understand the challenges to the currently partial ICT integration. Second the findings help to better understand the challenges to future full ICT integration. Third, this thesis
uncovers cultural factors that affect successful ICT integration. Finally, this thesis provides recommendations as guidance for teachers, school administrators, policy makers in the Ministry of Education, and researchers in the field of ICT and education, in order to achieve effective partial ICT integration and plan for future full ICT integration.
References


Al-Dayel, S. (2008) *Tqweem tjrbt alhasb alaaly fe atadrees alsafee fe madars altaleem alaam bemadeenat alriyadh belmmlkah alarabiyyah alsaudiah* [Evaluation of the use of computers in classroom teaching in public schools in Riyadh Saudi Arabia]. Kind Saud University, Riyadh. Retrieved from http://faculty.ksu.edu.sa/25175/DocLib2/%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%D8%A9%20%D8%A7%D8%AF%D8%AE%D8%A7%D9%84%20%D8%A7%D9%84%20%D8%A2%D9%84%20%D8%A7%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%D8%A9%20%D8%A7%D8%AF%D8%AE%D8%A7%D9%84%20%D8%A7%D9%84%20%D8%A2%D9%84%20%D8%A7%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%D8%A9%20%D8%A7%D8%AF%D8%AE%D8%A7%D9%84%20%D8%A7%D9%84%20%D8%AD%D8%B3%D8%A8%20%D8%A7%D9%84%20%D8%A2%D9%84%20%D8%A7%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%D8%A9%20%D8%A7%D8%AF%D8%AE%D8%A7%D9%84%20%D8%A7%D9%84%20%D8%AD%D8%B3%D8%A8%20%D8%A7%D9%84%20%D8%A2%D9%84%20%D8%A7%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%D8%A9%20%D8%A7%D8%AF%D8%AE%D8%A7%D9%84%20%D8%A7%D9%84%20%D8%AD%D8%B3%D8%A8%20%D8%A7%D9%84%20%D8%A2%D9%84%20%D8%A7%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%D8%A9%20%D8%A7%D8%AF%D8%AE%D8%A7%D9%84%20%D8%A7%D9%84%20%D8%A2%D9%84%20%D8%A7%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%D8%A9%20%D8%A7%D8%AF%D8%AE%D8%A7%D9%84%20%D8%A7%D9%84%20%D8%AD%D8%B3%D8%A8%20%D8%A7%D9%84%20%D8%A2%D9%84%20%D8%A7%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%D8%A9%20%D8%A7%D8%AF%D8%AE%D8%A7%D9%84%20%D8%A7%D9%84%20%D8%A2%D9%84%20%D8%A7%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%D8%A9%20%D8%A7%D8%AF%D8%AE%D8%A7%D9%84%20%D8%A7%D9%84%20%D8%AD%D8%B3%D8%A8%20%D8%A7%D9%84%20%D8%A2%D9%84%20%D8%A7%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%D8%A9%20%D8%A7%D8%AF%D8%AE%D8%A7%D9%84%20%D8%A7%D9%84%20%D8%A2%D9%84%20%D8%A7%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%D8%A9%20%D8%A7%D8%AF%D8%AE%D8%A7%D9%84%20%D8%A7%D9%84%20%D8%AD%D8%B3%D8%A8%20%D8%A7%D9%84%20%D8%A2%D9%84%20%D8%A7%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%D8%A9%20%D8%A7%D8%AF%D8%AE%D8%A7%D9%84%20%D8%A7%D9%84%20%D8%A2%D9%84%20%D8%A7%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%D8%A9%20%D8%A7%D8%AF%D8%AE%D8%A7%D9%84%20%D8%A7%D9%84%20%D8%A2%D9%84%20%D8%A7%D8%AA%D9%82%D9%88%D9%8A%D9%85%20%D8%AA%D8%AC%D8%B1%D8%A8%


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Schacter, J. (1999). The impact of education technology on student achievement: What the most current research has to say.


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APPENDIX A: IRB Approval

Date: March 21, 2014

From: The Office for Research Protections – FWA#: FWA00001534
       Courtney A. Whetzel, Compliance Coordinator

To: Sarah Almoaiqel

Re: Determination of Exemption

IRB Protocol ID: 45256

Follow-up Date: March 20, 2019

Title of Protocol: Cultural Influences on the Use of Collaborative Information Seeking Tools: a Study of Saudi Arabian Professionals’ Perceptions

The Office for Research Protections (ORP) has received and reviewed the above referenced eSubmission application. It has been determined that your research is exempt from IRB initial and ongoing review, as currently described in the application. You may begin your research. The category within the federal regulations under which your research is exempt is:

45 CFR 46.101(b)(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects’ responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects’ financial standing, employability, or reputation.

Given that the IRB is not involved in the initial and ongoing review of this research, it is the investigator’s responsibility to review IRP Policy III “Exempt Review Process and Determination” which outlines:

• What it means to be exempt and how determinations are made
• What changes to the research protocol are and are not required to be reported to the ORP
• Ongoing actions post-exemption determination including addressing problems and complaints, reporting closed research to the ORP and research audits
• What occurs at the time of follow-up

Please do not hesitate to contact the Office for Research Protections (ORP) if you have any questions or concerns. Thank you for your continued efforts in protecting human participants in research.

This correspondence should be maintained with your research records.
**APPENDIX B: Ministry of Education Approval**

<table>
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<th>الكلية / الجامعة</th>
<th>متطلبات الحصول على درجة / الماجستير</th>
<th>مهارات تابعة لإدارة التربية والتعليم بمنطقة الرياض</th>
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<td>مهارات تابعة لإدارة التربية والتعليم بمنطقة الرياض</td>
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حفظه الله

سلام عليكم ورحمة الله وبركاته.

بناءً على تعليمي من وزارة التربية والتعليم رقم 1045/9917 وتاريخ 19/12/93، يقضي تدريس مدير عام إدارة التربية والتعليم إدارة التعليم والبحث والدراسات. وبناءً على تدريس مدير عام إدارة التربية والتعليم إدارة التعليم والبحث والدراسات، نحن نقوم بإعداد مهام الباحثين والباحثات؛ ن⁻دحيم أن نحن لانحناس من تطبيق الدراسة على نطاق واسع من خلال تطبيق الإدارة التعليمية والبحثية، إجراء المقابلات اللازمة مع المعلمين والمعلمين داخل المسجد وخارجها مع ملاحظة أن الباحثة تحمل مسؤولية الطلاب والمعلمين. لا يعني سماح الإدارة العامة للتعليم، والتعليم والبحث، بالمشاركة في التدريس، من يغير أمور البحث. وبناءً على طلبات كثيرة، تم منحها الإذن.

沙特阿拉伯，原住民

معالي براء عبد الله

مدير إدارة التعليم والتطوير

على اسم

سعود بن راشد آل عبدالله
APPENDIX C: Ministry of Education Ease of Research Letter for Schools

تهيئة مهمة بحث

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<td>استفاء الآلات على عينة البحث المحددة</td>
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السلام عليكم ورحمة الله وبركاته

بناءً على تعميم محلي وزارة التربية والتعليم رقم 95/2014 بتاريخ 8/17/14 بشأن تزويد الإدارات العامة بالثوابت والثوابت بإصدار خطابات السماح للباحثين بإجراة البحوث والدراسات، وببناءً على تزويد مدير عام إدارة التربية والتعليم إدارة التخطيط والتطوير بمكتبة النهضات، ذي رقم 1237687121/10/17 بتاريخ 14/1/14 بشأن تمهيد الجهات والباحثين، حيث تقدمت إلى الباحثين ملاحظتها المطلوبة كما أعلاه، بطلب إجراء الدراسة، تأمل تسهيل مهمة، مع ملاحظة أن الباحثة تتحصل على ملف(action paper) المتعلقة بتوزيع الأدوات واستلامها من عينة البحث بعد استيفائها، ولا يعني سماح الإدارة العامة للتعليم والتعليم مواصلتها بالإضافة إلى مشكلة البحث أو على الطرق والأساليب المستخدمة في دراستها ومعالجتها.

شاكرين طيب تعونكم.

مدير إدارة التخطيط والتطوير

علي البراري الحاج

سعود بن راشد آل عبد اللطيف

من دار الدراسات الجامعية

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APPENDIX D: Interview Questions (Approved by Ministry of Education)

استفسارات للقابلة
سوف تتكون القابلة من ثلاث أجزاء:

الجزء الأول
الثاني من ضمن استفسارات الجزء الأول:
هل تعمل مع أكثر من شخص لإنجاز مشروع أو مهمة في وظيفتك؟
هل جميع الأشخاص متجاورين مكانياً؟
هل هناك أشخاص يعملون معك عبر الإنترنت؟
ماهي بعض المشاكل التي واجهتها عند العمل مع مجموعة أشخاص للبحث عن المعلومات وتبادلها؟
ماهي بعض البرامج التعليمية التي يتم استخدامها لتسهيل البحث عن المعلومات وتبادلها؟ ما الإجابات وسليبيات هذه البرامج؟

الجزء الثاني
في الجزء الثاني من القابلة سوف يقوم الباحث الرئيسي بعرض فيديو يشرح برامج الحاسوب المصممة لمساعدة مجموعة أشخاص على البحث عن المعلومات وتبادلها.

الجزء الثالث
الثالث من ضمن استفسارات الجزء الثالث:
هل تعتقد أن هناك حاجة لهذا البرنامج في مملكة العربية السعودية؟
ماهي بعض المميزات التي قد تكون مهمة ونافعة للميزات التي قد تكون غير ضرورية؟
ماهي بعض الميزات التي قد ترغب بها ولكنها غير متوقعة في هذا البرنامج؟
مع العلم أن هذا البرنامج ناجح من بحوث تم القيام بها في الولايات المتحدة. هل تعتقد أن تنفيذ هذا البرنامج في المملكة العربية السعودية قد يكون ناجحاً لماذا؟
APPENDIX E: Interview Questions (English)

Interview Questions

Part One
The following interview questions will be conducted:

Do you work with more than one person to accomplish a task or project?

Are all of the group members co-located?

Are any of the group members remotely located and work with you online?

What are some problems that you faced when collaboratively searching for and exchanging information?

What are some tools that you use to facilitate Collaborative Information Seeking? What are some advantages and disadvantages of these tools?

Part Two

During part two, the principal investigator will ask you to view a video and explain a Collaborative Information Seeking tool, SearchTogether, designed to facilitate collaborative information seeking.

Part Three

The following interview questions will be conducted:

Do you think there is a need for a tool such as SearchTogether at your work? Why or why not?

What are some features that you believe are important, and what are some features that may not be necessary?

What are some features not available on this tool that you believe might be beneficial?

Knowing that this software is the result of research that has been conducted in the United States, do you believe that the implementation of this software in Saudi Arabia could be successful? Why or why not?
APPENDIX F: Ministry Letter Confirming Completion of Research Study

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حفظ الله

السلام عليكم ورحمة الله وبركاته

بناءً على تعميم ممالي وزير التربية والتعليم رقم 75/910 وتاريخ 11/7/1141 حسب تضييق الادارات العامة للتدريب والتعليم بإصدار خطط للباحثين لإجراء البحوث والدراسات وتيسير مهامهم، وبناءً على تضييق مدير عام إدارة التربية والتعليم إدارة التخطيط والتطوير ذي الرقم 18179/8/10 وتأريخ 1/10/1442 حسب تيسير مهام البحث والباحثين حيث تبددت ذا الباحثة (المرشحة بتفاصيلها أعلاه) بطلب إجراء دراسته والتي بدأت من تاريخ خطاب تسجيل المهمة الصادر من إدارة التخطيط والتطوير، وعليه نأكد أن البحث قد أنهى طباعة إجراءات الدورة وتم تطبيق الأدوات، في مجال البحث (الدورة الإعدادية والثانوية) التابعة لإدارة التربية والتعليم في منطقة الرياض التعليمية، وبناءً على طلب تم منحه الإفادة.

مدير إدارة التخطيط والتطوير

براءة المحترم

سعود بن راشد آل عبد اللطيف

(الوقت)

planingm@rpe Gov.sa / Al-takhteer@hotmail.com