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Secondary Teacher Attitudes Toward Computer-Based Devices in Saudi Arabia

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List of Abbreviations

ICT	Information and communication technologies
MCIT	Ministry of Communications and Information Technology, Saudi Arabia
MOE	Ministry of Education, Saudi Arabia
OECD	Organisation for Economic Cooperation and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization

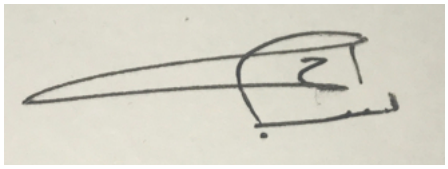
Abstract

In Saudi Arabia there are differing societal expectations in education according to gender. These cultural issues tend to lead to differences in how males and females view technology according to the framework of values and norms in this society and there tends to be a gender gap in information technology access and usage by women. This research examined the attitudes of secondary school teachers in Taif, Saudi Arabia towards the use of computer-based devices in the classroom teaching and learning process. The aim was to examine whether with the increasing pace of advances in technology and especially developments in the use of computer-based devices in schools, gender differences in attitudes towards technology exists in Saudi Arabia. The study collected and analysed data using self-report questionnaires from 547 teachers, which included responses from participants about their attitudes to computer-based devices in education. The results from each participant were examined according to individual demographic information, such as age and gender, as well as years of teaching and computer experience. The study found positive attitudes toward using computer-based devices in the classroom environment were prevalent among both male and female teachers, indicating a change from some studies of attitudes in the past. Contrary to some prior studies, the study did not find an association between teachers of different age, gender, years of teaching, computer experience and their attitudes towards computer devices in schools. Results indicate that positive attitudes towards the use of digital technology in schools are pervasive.

Key words: Computer-based devices, attitudes, computer usefulness, computer confidence, computer liking, computer anxiety.

Declaration

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university. To the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.



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CHAPTER ONE: INTRODUCTION

1.1 Overview

In recent years, there has been a significant increase in the use of computer-based devices, particularly in 21st century classroom education and other learning environments, including the home, the community, and online (Gray, Dunn, Moffett, & Mitchell, 2017). Generation Z, generally regarded as the youngest members of society who were born in the post-Millennium age, are now growing up in an era where the use of technological devices, computer software and the Internet have become popularised (Garrick, Pendergast, & Geelan, 2016). McCrindle (2015) has commented on how the attitudes, competencies, and behaviours of this latest cohort have been influenced by their increased familiarity with personal digital devices, social media platforms, and text forms of communication. As pointed out by Gray, Dunn, Moffett and Mitchell (2017), "for children growing up in today's world, digital technologies are as unremarkable and ubiquitous as electricity, becoming visible only in their absence" (p. 14). Robertson and Al-Zahrani (2012) have noted that the "younger generations and computer-based devices are inseparable in their everyday lives" (p. 1138). Moreover, young people view activities driven by computer-based devices as pleasurable and pleasure enhancing, while employers and Higher Education (HE) institutes are demanding that young people be digitally prepared for employment and learning contexts (Fu, 2013; Leask, 2013). In this context, there are growing calls for information and communication technologies (ICT) to be integrated across educational establishments and throughout the school or university curriculum.

1.2 Teachers' Attitudes

Previous studies regarding teachers' attitudes toward using computer-based devices have reported positive attitudes among teachers. For example, Moghaddam (2010) found that teachers favoured technology and online instruction. In addition, Steel and Hudson (2001) noted that teachers attempt to use technology because of the perceived benefit that technology brings to their teaching and student learning in terms of flexibility, resource opportunities, and enhancement of student engagement. Albirini (2006) has pointed out that the attitude of educators towards the use of ICT ultimately determines how computer-based devices are used in the teaching process. This is considered an essential factor of successful implementation of computer-based devices in education.

Attitude is defined as "a disposition to respond favourably or unfavourably to an object, person, institution, or event" (Ajzen, 2005, p. 3). Consequently, it can be argued that today's attitudes of teachers in Saudi Arabia's schools form an essential aspect of any program to implement computer-based devices in education there, now and for the future (Alothman, Robertson & Michaelson, 2017).

Since Albirini's (2006) study, little research has been undertaken to examine if teacher attitudes have changed in the Middle East, Syria in particular. In his study, Albirini found that teacher attitudes towards the use of computers and ICT were positive (agree = 69.9%, strongly agree = 20.7%), and he found that attitudes towards ICT use in teaching predicted the likelihood of computer-based devices being incorporated effectively in the classroom environment. The present study sought to explore secondary teachers' attitudes in Saudi Arabia towards using computer-based devices during the intervening years, given the rapid proliferation of computer-based devices in education and society generally. Exploring this issue in the context of Saudi

Arabia is essential because in many cases, there is still a lack of enough teacher training opportunities and a lack of familiarity with ICT as a useful tool in teaching. Consequently, teachers may not view computer-based devices in a positive light and may continue to prefer conventional teaching methods. Given gender roles in Saudi Arabia, the attitudes of female teachers towards computer-based devices are also in question.

1.3 Background: Saudi Arabia's Education System

Unlike the classrooms of many other countries, gender segregation in Saudi Arabia and other forms of social and cultural conservatism are a requirement in the Saudi education system (Baki, 2004). For example, mixed gender classrooms are prohibited in Saudi schools, with separate staff and buildings for female and male students. Furthermore, there are differing societal expectations in education according to gender. These cultural issues tend to lead to differences in how males and females view technology according to the framework of values and norms in this society. Moghaddam (2010) pointed out that developing countries typically have higher levels of social, economic, and gender inequality between people, and that there tends to be a gender gap in information technology access and usage by women. Saudi society exists within a set of strict cultural and religious guidelines that tend to strengthen masculine role models and male-dominant environments in many sectors (Alenezi, 2014).

This aspect is particularly true in employment and technical fields where there are limitations on gender diversity. Consequently, women in Saudi Arabia still face significant challenges in the workplace that lead to segmentation in select fields of academic study according to socio-cultural barriers, such as Arab society's views about what are appropriate occupations and career paths for women, and how much men and women should interact in the workplace. For this reason, female teachers in Saudi Arabia tend to consider the use of

technology in the educational process more difficult and less useful and, consequently, their positive attitude towards computer-based devices is less than their male counterparts (Alturise, 2017).

In a broad review of 71 refereed studies in the literature, Kay's (2008) research on gender differences in attitudes to computers concluded that "males and females are more similar than different on all constructs assessed, for most grade levels and contexts" (p. 12). He noted, "However, males report moderately more positive affective attitudes, higher self-efficacy, and more frequent use" (p. 12). Therefore, the specific context of social and cultural conservatism in education in Saudi Arabia could affect teacher attitudes toward using computer-based devices in their classrooms (Amoudi & Sulaymani, 2014).

1.4 The Context of Computer-Based Devices in Education in Saudi Arabia

With increased emphasis on the use of computer technology in education, secondary education institutions are increasingly challenged to prepare competent teachers who have the knowledge and skills to use computer technology effectively in the classroom (Sahin & Thompson, 2006). As with many other countries, Saudi Arabia has recognized the significant role of computer technologies in education and has taken steps to provide computer-based devices to schools, colleges, and universities.

Educational policy planning in Saudi Arabia occurs every five years. The Seventh Development Plan (2000-2005) in Saudi Arabia included a comprehensive plan to integrate computer-based devices in its education system (Achoui, 2009). Subsequently, the Eighth Development Plan (2005-2010) was intended to address a number of emerging problems that were affecting the education system, in particular resolving the difficulties posed by the new

information and communication technologies in teaching and learning in the classroom. Recognising the importance of the these looming issues in implementing ICT-based education, the eighth plan set objectives that defined the growth of the information and communication technology infrastructure and its use in pedagogical processes (Ministry of Education [MOE], 2016).Saudi Arabia's most recent, Tenth Development Plan (2015-2019) has identified eight main goals in education to be pursued: enhance students' core values and skills; activating the capacity of the educational system; diversify innovative financing sources; curriculum development; teaching methods and evaluation; raising private sector participation in education; provide education services to all student elders; improve the recruitment, preparation and rehabilitation of teachers and faculty members; and improving the environment for creativity and innovation (Ministry of Education [MOE], 2016). This latest plan emphasises the government's commitment to education as part of its Saudi Vision 2030 (2019) focus on diversifying the economy and reducing its dependence on oil and gas reserves. The 10th Development Plan has been described by the government as the first part of a 15-year transformation of the Saudi economy into a knowledge economy.

Among the many challenges facing Saudi Arabia are the current needs of the economic and business sectors in the country for technically skilled employees, particularly in the STEM disciplines of science, technology, engineering, and mathematics. These needs are not being met by output from the education system (Alyami, 2014; General Authority for Statistics, 2019; Saudi Vision 2030, 2019). Consequently, human resource development in the areas of technological advancement and innovation and the knowledge economy are being hindered. Bridging the technological gap between Saudi Arabia and the technologically advanced countries by 2020 is one of the top priorities of the Saudi Arabian development plan (Ministry of

Communications and Information Technology, 2015). However, utilising computers for learning and teaching in Saudi Arabia's schools has not yet been fully achieved (Alturise, 2017). Accordingly, Saudi Arabia needs to recognise and create the conditions that promote the successful implementation of computer-based devices in education.

In the education sector, applications related to computer-based devices are also referred to as educational technologies (Mangin, 2011). In my study, computer-based devices in education refer to computers and other information and communication technologies that, when applied to the teaching process, can significantly change the traditional method of education delivery. Examples of these information technologies and their uses in education include electronic email, computer technologies used to generate course materials, such as audio - visual presentation programs and word processing, mobile devices, such as phone applications, smartphones, tablets and iPads, and online platforms, such as websites, blogs, social networking sites, and campus educational forums. Information systems used to manage various courses, such as course management systems or learning management systems, are other examples of tertiary level educational technology. Information technologies can be used by schools for lesson planning, electronic research purposes, and for recording and presenting classes online (Mangin, 2011; Roblyer, 2006).

Empirical evidence suggests that there are multiple benefits to embedding computer-based devices in the classroom environment, such as encouraging collaborative learning, equipping students with problem solving skills, and offering flexible learning opportunities for schools, teachers, and learners alike (Almalki & Williams, 2012; Donnelly, McGarr & O'Reilly, 2011; Leask, 2013; Tondeur, Van Keer, van Braak, & Valcke, 2008). Given the appeal of computer-based devices to young people, students' concentration in the classroom may be

enhanced, which both promotes learning, and reduces problematic behaviour (Lim et al., 2003). Computer-based devices are interactive, which can lessen the perceived sense of student boredom, and can be used to promote active, personalized participation in learning. In turn, this can boost efforts at learning and can help develop student capabilities in creativity, innovation, and problem-solving (Fu, 2013). Furthermore, according to Moyle (2010), young people are better prepared for careers and employment in the modern world and for contemporary challenges in a globalized information economy when they learn via computer-based devices rather than by traditional means, such as teacher-centred lessons, passive learning, and rote memorization.

Therefore, ICT has been identified as an important aspect of technology that influences learning and teaching methods. Most importantly, ICT helps to deliver quality information and instruction through which learning approaches become more effective and possible for the greatest number of people (Lawless & Pellegrino, 2007). Accordingly, teachers are now expected to enter their career or the field of teaching with content area knowledge as well as knowledge of the best ways to integrate ICT into the teaching of educational content. Current expectations are that teachers must have an informed awareness of the use of ICT so that it can be used to support student learning and knowledge enrichment (Wright & Wilson, 2007).

In addition to the need for teacher knowledge of ICT, schools can prepare students for a digital world by enabling them to do their projects and other work utilizing information technology resources. These new types of activities are part of major reforms in pedagogical methodology that help students engage with a change in their role from being passive receivers of educational content to being active participants and partners in the learning process (Roblyer, 2006).

1.5 Statement of the Problem

Given the recent proliferation of computer-based devices both inside and outside of the classroom, it is perhaps unsurprising that there has been growth in the number of empirical studies that investigate computer-based device use in the classroom, including studies that specifically focus on the attitudes of teachers for the use of computer-based devices (Fu, 2013; Leask, 2013). Some teachers, for instance, have been found to have negative attitudes towards such technologies and view them as disruptive in the classroom and distracting to students (Rogers & Finlayson, 2003; Scherer & Hatlevik, 2017). While most of these studies have been undertaken in other countries, there are some studies from Saudi Arabia that have discussed the implications of negative teacher attitudes towards integrating computer-based devices in schools (Alrashidi & Phan, 2015). For example, Alrashidi and Phan (2015) found that when teachers have a negative attitude toward a technology, they are most likely to avoid it. Due to their attitude, they are reluctant to become acquainted with the new device or to start utilizing it for teaching in school classrooms. This research result suggests that, due to their lack of confidence, teachers showed a tendency to exclude themselves from training related to new technology and otherwise resisted involvement in or the use of new technology. This factor hinders pedagogy in the Middle East from developing and following the state-of-the-art pedagogical trends of the Western world (Rogers, 2000).

Apart from teachers' lack of confidence in using technology in the classroom, a further objection teachers may have is that, since young people use computer-based devices frequently in the home and on their personal devices, over-reliance on computers in the learning environment may be tiring, ineffective, and counterproductive (OECD, 2015). For example, a recent OECD (2015) report showed mixed results in terms of computer integration up until the

time of the study in schools around the world. The 2015 OECD Program for International Student Assessment (PISA) report stated that even countries that have invested heavily in computer-based devices for education have seen no noticeable improvement in student performance results for reading, mathematics or science subjects. Consequently, some teachers hold the view that computers are a distraction and do not necessarily improve student outcomes in learning (Donovan, Hartley, & Strudler, 2007).

Additionally, some educators have been concerned about the effect that technology has on their roles as classroom instructors and how the new self-led computer-based study methods diminishes their importance as leaders of learning, and therefore their job security (Donovan, Hartley, & Strudler, 2007; Mukti, 2000). This has led Scherer and Hatlevik (2017) to claim that computer-based device-driven classrooms promote an overuse of technologies, with negative consequences in terms of both physical and cognitive aspects of the health and well-being of young people. Scherer and Hatlevik (2017) have blamed excessive computer-based device screen time for growing levels of youth depression, inattention, and sleep deprivation, leading to a lack of alertness and sore eyes. The attitude of teachers, therefore, may be shaped by a growing awareness or perception that the integration of computer-based devices in schools has yet to achieve the potential level of success, achievement, and reward that was envisaged several decades ago.

While there are studies that have focused on the context of attitudes towards the use of computer-based devices in the classroom, few studies have explicitly examined this issue in Middle Eastern countries, particularly at the secondary-school level or specifically in Saudi Arabian contexts (Albirini, 2006; Buabeng-Andoh, 2012). In particular, Albirini (2006) explained the relationship between computer attitudes and five independent variables (discussed

in the next chapter), namely computer attributes, cultural perceptions, computer competence, computer access, and personal characteristics (including computer-training background). Albirini found that most of the Syrian teachers in that study had a positive attitude towards computer-based devices and wanted their students to engage with the technology in education by being a part of computer-based interactive activities. Buabeng-Andoh (2012), on the contrary, noted that many of the teachers in a wide-ranging review of international studies were simply not ready to take up computer-based devices on a regular basis because they significantly lacked the knowledge and skills needed for such an integrative approach. As such, the idea of integrating computer-based devices into a classroom learning environment will remain questionable unless teachers acquire the respective education in conjunction with pedagogical training (Buabeng-Andoh, 2012).

At present, minimal research has been undertaken to examine if teachers' attitudes have changed to more closely align with global trends in computer-based devices integration in schools (Amoudi & Sulaymani, 2014), particularly in secondary schools in Taif, Saudi Arabia. Presently, there are endeavours by the Saudi Ministry of Education to enhance the utilisation of computer-based devices in schools in the region, which is important as the schools in Taif region serve over 60,000 students (Ministry of Education [MOE], 2016). In view of the fast changes in the integration of computer-based devices in secondary schools in Saudi Arabia, there is a need for a study to evaluate teachers' attitudes toward using computer-based devices in secondary schools in Taif, Saudi Arabia.

1.6 Research Location

The ancient, holy city of Taif is in the southwestern region of Saudi Arabia located on the eastern slopes of the Hejaz mountains at an altitude of 1800 metres (Saudi Commission for

Tourism and Cultural Heritage [SCTH], 2019). Taif is situated strategically at a crossroads of important historical and present-day transport routes with major roads coming from the South and the North, as well as the East and West of the Arabian Peninsula. Due to its proximity to the Holy City of Makkah less than 100 kilometres to the west, Taif is regarded as one of the principal gateways for the millions of Muslim worshipers who undertake a pilgrimage to Makkah for the annual Hajj. Consequently, Taif has been a significant commercial, agricultural, and religious hub of human activity of great cultural and economic importance since the time of pre-Islamic civilisations, which settled there well before 610 CE (Common Era) in the 7th century, to the present day. Due to its elevation and relatively cool climate, Taif is considered the summer capital of Saudi Arabia and is one of the most beautiful and culturally significant cities in the kingdom attracting tourists from all over Saudi Arabia and the Gulf countries to enjoy its moderate temperatures, mountainous scenery, festivals, and heritage sites (Saudi Arabia Tourism, 2018).

The education system in the city of Taif is provided through governmental and private schools, with government schools offering mainly free education to all students. Schools are not co-educational, and consist of four levels: primary; intermediate; secondary; and university levels (MOE, 2017). There are approximately 72 secondary schools with a total population of about 20,000 students. The target population for this study was female teachers at secondary schools within the Taif school district, and this group was chosen due to the researcher's familiarity with the location and experience of ten years computer science subject teaching in the Taif education sector. The focus of this study was on secondary teachers because there is an emphasis in the Saudi government ICT policy on secondary education where the new curriculum aims to integrate ICT in secondary schools (MOE, 2017; Oyaid, 2009).

1.7 Theoretical Framework

The current study will use the Technology Acceptance Model (TAM) proposed by Davis (1986) and based on Fishbein and Ajzen's 1975 Theory of Reasoned Action (Al-Suqri & Kharusi, 2015) to identify the impact of attitude on an individual's behaviour. TAM represents the five basic factors that determine intention, attitude, and consequently the actual use of any information system (see Figure 1). These five factors include attitude towards use, ease of use, perceived usefulness, behavioural intention, and actual use (Legris, Ingham, & Collerette, 2003). Therefore, the teacher's attitude towards technology in the classroom environment influences the successful implementation of the technology, which then directly affects its use in teacher instruction and student learning (Albirini, 2006; Buabeng-Andoh, 2012).

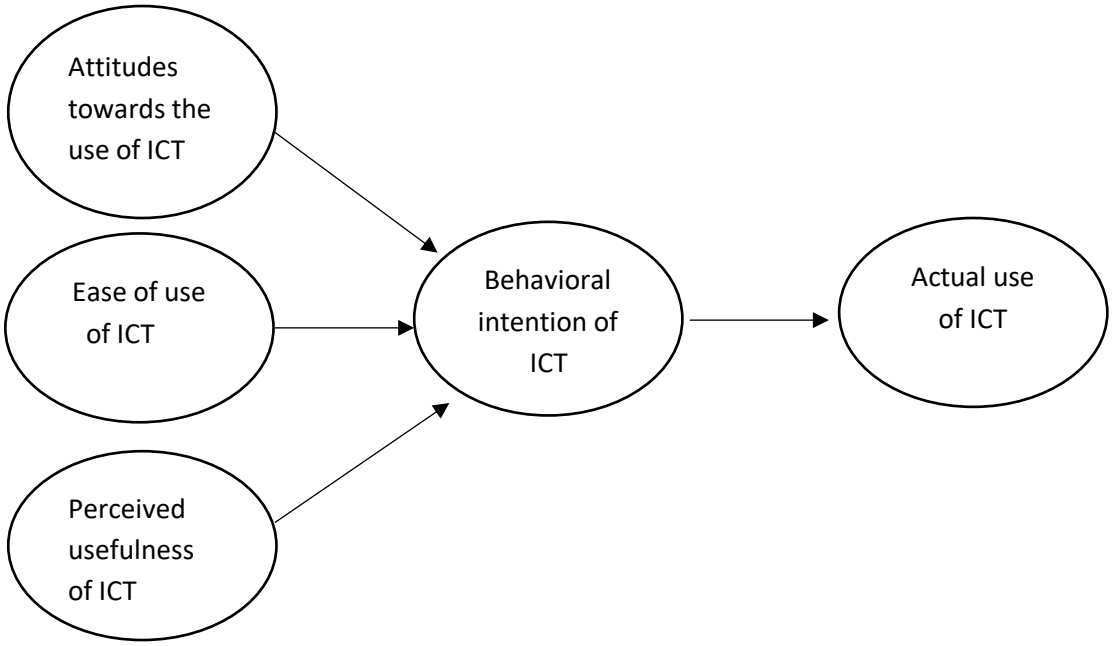


Figure 1. Technology Acceptance Model (TAM) (Davis, 1986)

Teachers play a significant role in the teaching and learning process, which cannot take place without their participation; they are the ones to find a perfect balance between the activities and build the prominent studying strategies by exploiting technological innovations. Therefore, the optimal utilization of ICT in the secondary educational institutes of Saudi Arabia depends on teachers' acceptance of ICT (Al-Busaidi & Al-Shihi, 2010). If teachers have positive attitudes toward the use of ICT and find the features of it to be beneficial and not very challenging, there is a high likelihood of its successful adoption and implementation for teaching in secondary schools across the country.

Currently, the Ministry of Education in Saudi Arabia (2007) is attempting to improve the use of ICTs in secondary schools in the southwestern province of Saudi Arabia. However, there has been little research conducted to examine secondary teachers' attitudes towards ICT-driven classrooms, not least in the context of delivery in the Middle East, which has been comparatively slow as a region to adopt progressive ICT implementation in the secondary classroom (Albirini, 2006; Buabeng-Andoh, 2012). Albirini (2006) found that the attitudes of EFL teachers in Syrian high schools towards ICT were positive; therefore, they were more likely to accept and adapt technology in teaching and learning. There has been a consequent lack of focus on the attitude of teachers towards the use of ICT in the geographic, social, and cultural context of Saudi Arabia. Therefore, this study aims to examine whether attitudes toward using ICT have changed by exploring secondary teachers' attitudes toward using ICTs in secondary schools in Taif, Saudi Arabia.

1.8 Education in Saudi Arabia

Although Saudi Arabia has in place strong public policy to support the development of new technologies in all aspects of daily life, effective integration of computer-based

devices into the country's learning landscape appears to be lagging behind those of other countries, as well as that which is suggested by the public policy (Robertson & Al-Zahrani, 2012, p. 1138).

It is clear from a number of recent studies, such as Alenezi (2014), Alrashidi and Phan (2015), and Alturise (2017) as outlined in the next chapter, that schools in Saudi Arabia have not kept pace with other nations and have yet to achieve the technological advances in education that the government has envisaged (Almoaiqel, 2015; Alothman, Robertson, & Michaelson, 2017; Amoudi, & Sulaymani, 2014; Buabeng-Andoh, 2012; Oyaid, 2009).

Education in Saudi Arabia, in general, is still based mainly on traditional teaching methods. According to Alrashidi and Phan (2015), it is clear that pedagogical approaches in modern Saudi educational establishments have remained largely unchanged despite efforts to modernize the curriculum and quality of education. In the traditional method, instruction is teacher-centred with students having a passive role (Miller, Martineau, & Clark, 2000). However, with the incorporation of technology in classrooms, it is widely recognised that traditional teaching methods and the teacher's role in the classroom should be changed (Wang, 2001, 2002b). In an ICT-oriented classroom, teachers should work toward more student-centred teaching where their role is one of a facilitator (Wang, 2001, 2002a). In order to execute changes in their teaching methods and their roles as teachers therefore, the effective use of technology by teachers depends greatly on their attitude towards the use of computer-based devices (Bennett & Bennett, 2003; Peluchette & Rust, 2005).

According to Alrashidi and Phan (2015), there is a need to upgrade current school technologies and methodologies in Saudi Arabia so that the growing generations are exposed to

modern, computer-based teaching methods. An evaluation of the challenges that education institutions face as they attempt to accommodate new technology is vital. Furthermore, Alrashidi and Phan suggested that an evaluation of computer-based device use needs to focus on teacher attitudes and opinions towards computers. Therefore, it is clear that a lack in understanding of teacher attitudes toward computer-based devices in the context of Saudi education represents a problem that further research may help to overcome. Accordingly, this study sought to explore secondary teachers' attitudes toward using computer-based devices in secondary schools in Taif, Saudi Arabia.

1.9 Research Rationale

The research literature generally arrives at the conclusion that computer-based devices are positive for teaching and learning by promoting increased levels of concentration and attention among students, reducing levels of disruption, and making learning appealing, fun, active, and interactive (Bachmair, & Pachler, 2015; Fu, 2013; Gray, Dunn, Moffett, & Mitchell, 2017). However, it is also observed that Saudi Arabia has been slow to integrate computer-based devices into classrooms (Alothman, Robertson, & Michaelson, 2017; Amoudi, & Sulaymani, 2014; Buabeng-Andoh, 2012). As such, this study sought to advance our current understanding of how Saudi teachers' attitudes towards computer-based and device-driven classrooms and education in Saudi Arabia may have changed in the last decade, due to increasing familiarity and proliferation of computer-based devices in the global and Middle Eastern education environment.

The purpose of this study was to explore secondary teachers' attitudes towards computer-based and device -based environments in secondary schools in Taif, Saudi Arabia. In addition, it examined how secondary teachers' attitudes toward computer-based devices differed according to personal and demographic characteristics, such as age, gender, and years of teaching

experience. Previous studies, such as that by Papaioannou and Charalambous (2011), have found that even when the teachers' general attitudes towards ICT are positive, there could be statistically significant differences across gender, academic qualification, years of service, and ease of access to computers. While these primary demographic or individual factors are the most prevalent independent variables that have been used in research to assess teacher attitudes, the results of some studies and the conclusions drawn from the research have often been in disagreement or even in contradiction with others. This dichotomy could be explained by the complexities of human attitude, by the existence of confounding variables, and by the differences in place and time of studies in the literature on the subject, as attitudes differ from one place to another in the world, and attitudes also vary over the passage of time in a continual process of change (Fishbein, &. Ajzen, 1975). For example, earlier studies of the age variable (Bingimlas, 2009; Mangin, 2011) may have concluded that younger teachers were more receptive than older, long-serving teachers toward computer-based devices in the classroom. However, studies done several years later may conclude that there were no longer differences between the age cohorts, as the passage of time and increasing ubiquity of computers had allowed more senior teachers to gain confidence with the technology and recognise its applicability to pedagogy (Alturise, 2017; Al Mofarreh, 2016). Likewise, attitudes toward gender roles and gender equity are undergoing rapid change in many nations and social or work settings, which may tend to remove or at least alter longstanding biases in the attitudes of female and male teachers (Alenezi, 2014; Amélie, 2008; Amoudi & Sulaymani, 2014; Baki, 2004; Kay, 2008; Whitely Jr, 1997). Moreover, the pace of technological change and policy development in education is neither consistent in the world, nor is there economic parity between nations and communities such that access to computers is going to be equal across all societies or schools. Therefore, it is understandable that

attitudes will vary according to age, gender, years of teaching experience, as well as familiarity with computers. Moreover, studies will arrive at differing conclusions regarding the significance of these variables in their effect on attitudes. Hence, the need for continual research and monitoring of change is essential to understanding how the introduction of computer-based devices is affecting teachers, students, and education communities. Accordingly, this need forms the principal rationale for this study, which aims to contribute to knowledge in this field of research.

1.10 Study Objectives

The objectives of this study were to:

- examine the attitude of a sample of secondary teachers based in Taif, Saudi Arabia toward computer-based devices in the classroom environment;
- examine if secondary teachers' attitudes differed according to their personal and demographic characteristics, such as years of teaching experience, gender and age;
- undertake a qualitative exploration to explore teachers' experiences with computer-based devices in teaching.

1.11 Research Questions

In accordance with the study objectives, this study sought to answer the following research questions:

1) In Taif, Saudi Arabia, what are secondary teachers' attitudes toward computer-based devices in the classroom environment?

2) Do teachers' attitudes vary as according to years of teaching experience, gender, or age and experience with computer technology?

3) What additional information do teachers have that will enable understanding of their attitudes about using computer-based devices in their classroom?

By addressing these questions, this study expected to identify distinct aspects and new findings from Saudi schools that have not been investigated in studies where education reforms have taken place. By addressing these questions, the present research expected to provide an update on findings from Saudi schools that other researchers, for example, Alrashidi and Phan (2015), reported on years ago.

1.12 Significance of the Study

The importance of this research stems from its contribution to knowledge, particularly its generation of useful information to support future developments in the use of computers in the educational system in Saudi Arabia. It is hoped that the results of this study will:

1) Provide Saudi educators with a new understanding of, and insights into, secondary school teacher attitudes about computer-based devices in the classroom. In addition, present the views of teachers on current technology policy and its influence on their teaching style, which would enable policy makers to make decisions based on informed judgments rather than intuition.
2) Provide the Ministry of Education (MOE) in Saudi Arabia with new information relating to issues, which need to be considered in addressing future educational policies.
3) Build on the existing theoretical literature that explores the link between computer-based devices-driven teaching and learning, and the learning capabilities of students.

4) Test ideas about the importance of teacher attitudes as drivers of the integration of computer-based devices in the classroom.
5) Extend the current literature by advancing current understanding in the area of ICT and education in Saudi Arabia.
6) Open the way for more research on the future of education in the Saudi context.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

According to Baruch and Holtom (2008), the use of computers in Saudi schools stretches back to the 1980s when they were used for administrative and management purposes. However, it was not until the 1990s that schools began using computers and applying them in the contexts of teaching and learning. This new focus was a result of the Saudi government's renewed interest in making education a key component of its economic growth (Baruch & Holtom, 2008). By adopting this strategy, the government sought to place Saudi Arabia among the top ranked countries in educational standards. According to the government, e-education was critical in preparing the students to address the existing cultural, economic, and global challenges (Baruch & Holtom, 2008).

Over the past few years, the education sector in the country has been undergoing reform through the integration of ICT in secondary schools (Ministry of Communications and Information Technology [MCIT], 2017). In Saudi Arabia's Vision 2030 plan, the MCIT sees the future of education in the country as, "Virtual classrooms, connecting young Saudis with the best educators, offering a step-change in the quality of education to harness the immense potential of the Saudi people" (p. 1). This pedagogical reform has provided learning opportunities for Saudi students via access to a broad range of ICT resources and teachers' engagement in innovative ways of instruction (Alzamil, 2003).

Through ICT, students have an opportunity to access 21st-century skills while maintaining the values and principles of Saudi Arabia (Almoaiqel, 2016). The acquisition of skills, such as creativity, evaluation, global awareness, and social skills is critical in preparing students to face the challenges of the contemporary world (Almoaiqel, 2016). Among other key

stakeholders, teachers have a great responsibility in ensuring the successful adoption of the 21st century skills by students. Therefore, due to the key role played by teachers, it is important to assess their attitudes towards the integration of e-learning in schools. In the current study, the researcher traced this issue by evaluating secondary teachers' attitudes towards the implementation of computer-based devices in Saudi schools.

2.2 Background towards the Usage of Computer Devices in Schools

A number of researchers (Fu, 2013; Leask, 2013; Lim et al., 2003; Robertson & Al-Zahrani, 2012), attributed the use of computer-based devices in the classroom and for improving the digital competencies of teachers to a pedagogical shift that has occurred to accommodate rapid developments in the widespread use of computer-based devices in business, employment, and society generally. Owning and using laptops, smartphones, and other mobile devices is now considered a normal part of everyday life (Bachmair & Pachler, 2015; Robertson & Al-Zahrani, 2012). Mobile computer-based devices, such as smartphones and tablets, are portable and lightweight, and can be used to access the Internet to accommodate and make use of a wide range of third party applications that are facilitative in engaging, informing, and providing educational content (Bachmair & Pachler, 2015).

Recent literature suggests that computer-based devices have become more affordable and therefore much more accessible to a wider range of users, including people in less developed countries and those living in low socio-economic circumstances (Fu, 2013; Leask, 2013). With recent technological and commercial developments in telecommunication, mobile broadband Internet coverage has been increasing at a rapid rate and is now estimated to be available to over 70 per cent of the global population (United Nations Broadband Commission, 2018). In developed countries, broadband-enabled smartphones are popular due to their convenience,

whereas in many developing countries the inadequacy and unreliability of telecommunications infrastructure makes the wireless mobile platform a necessity.

Access to the Internet and digital literacy is now seen as vital for achieving the United Nations Sustainable Development Goals (SDGs) of social, economic, and gender equality, which is aimed at bringing political and economic empowerment to all people. Digital skills and connection to digital resources are becoming increasingly important for accessing e-finance, employment opportunities, education, and to obtain political, consumer and health information (UNESCO, 2017).These changes have made computer-based devices more common in society, even among populations (such as the very young and the very old) that would not previously have used them. Consequently, the distinctions between online and offline culture and society is increasingly blurred (Legris, Ingham, & Collerette, 2003). As computer-based devices have advanced and become more affordable, available, and accessible, their ubiquity has been boosted; the corollary of this is the question of whether education should be any different (Bachmair & Pachler, 2015; Fu, 2013; Leask, 2013).

Certainly, the concept of the 'digital citizen' – persons with the necessary knowledge and skills to navigate in a world increasingly dependent on computer-based devices has become a significant goal for the United Nations (UN) and other international organizations dedicated to improving global education standards (UNESCO, 2016). For example, a recent report by the UN Broadband Commission's Working Group on Education (2018) states that the growing need for digital literacy has created significant implications for education programs in schools and universities (United Nations Broadband Commission, 2018). In particular, the report points to the need for "blending traditional 'non-digital' education approaches and digital applications" in

classrooms, for the “integration of digital skills development into school curricula”, and for “enhancing the digital competencies of teachers” (p. 4).

In Saudi Arabia, the government has increasingly realised the importance of the use of computer and information technology in the education system to improve educational standards (MOE, 2016). As a result, computer programs were introduced to the national curriculum at the secondary school level and in colleges and universities. All high school curricula in Saudi Arabia consist of general curricula, which are standardised across the country for all levels of high school (MOE, 2007).

As a consequence of the rapid development of technology in Saudi Arabia there is a need to change the way of acquiring skills and knowledge in schools because maintaining the old ways of learning acquisition cannot meet the demands of the new information technology age (Centre for Educational Development, 2004). Saudi Arabia is in the process of setting out a 25-year strategy to map out its higher education system, in order for it to be in tune with the country’s development and job market requirements. A central element of the plan is information technology (MOE, 2007). The ministry will carry out seven training programs for more than 400,000 teachers, focusing on their specialisation, school management, educational supervision, computer science, self-development and improvement of skills. An official from the Ministry of Education, Mr Al-Obaid, is quoted as saying, “The atmosphere in classrooms will be improved by providing modern technological facilities such as interactive boards, displaying devices, communication network and Internet services,” (MOE, 2007). Accordingly, the plan ensures that teachers will be provided with modern information technology and will be given intensive training to help them become familiar with modern technology development and changes (Abdul Ghafour, 2007). However, the plan is yet to be implemented fully.

2.3 The Saudi Arabian Context

A number of authors have written recently about the unusual social and religious context of education in Saudi Arabia, which has implications for the process of reform and advancement of the education system (Alenezi, 2014; Al Alhareth et al., 2015; Le Renard, 2008; Meijer, 2017). This context, in turn, has implications for the attitudes of women teachers toward computer-based devices in the classroom. Unlike the classrooms of many other countries, gender segregation in Saudi Arabia and other forms of social and cultural conservatism are a requirement in the Saudi education system (Baki, 2004). For example, mixed gender classrooms are prohibited in Saudi schools, with separate staff and buildings for female and male students. Furthermore, there are differing societal expectations in education according to gender. For example, in Saudi Arabia, social expectations concerning women's roles in the family structure mean that they stay longer in school compared to their male counterparts due to the additional time they must spend tending to domestic chores (Alenezi, 2014). These cultural issues tend to lead to differences in how males and females view technology according to the framework of values and norms in their society.

Moghaddam (2010) points out that developing countries typically have higher levels of social, economic, and gender inequality between people, and that there tends to be a gender gap in information technology access and usage by women. Saudi society exists within a set of strict cultural and religious guidelines that tends to strengthen masculine role models and male-dominant environments in many sectors (Alenezi, 2014). This aspect is particularly true in employment and technical fields where there are limitations on gender diversity. Due to cultural conservatism and gender bias, Saudi women are discouraged from pursuing careers in the male-dominated fields of science, technology, engineering, and mathematics (STEM) (Alenezi, 2014,

World Economic Forum, 2018). As a result, they continue to face significant hurdles in their careers and at the workplace, prompting the segmentation of professional and technical work to merge with societal expectations for both genders. For this reason, female teachers in Saudi Arabia tend to consider the use of technology in the educational process more difficult and less useful and, consequently, positive attitudes towards computer-based devices amongst Saudi women are less than among their male counterparts (Alturise, 2017). Hence, Saudi Arabian female teachers tend to find inclusion of technology into the curriculum difficult and redundant, and they share a negative attitude towards the use of computer-based devices compared to their male peers (Alturise, 2017).

Other potential barriers to the integration of computer-based devices in education exist, particularly in girl's schools. For example, Alenezi (2014) suggested that because of prevalent Islamic views, the implementation of policies on computer-based devices in Saudi girls' schools would prove difficult. However, a number of authors who have examined this issue (e.g., Alturise, 2017; Robertson & Al-Zahrani, 2012) stressed that the most effective way to improve the country's educational system is through the introduction of contemporary technologies and the development of improved attitudes toward computer-based devices in the national curriculum. Therefore, it is of great importance to identify and recognize the cultural and religious landscape of Saudi Arabia to ensure the successful integration of computer-based devices in the education system of the country. This will in turn provide teachers with the necessary reassurance that the new forms of technology mostly used in Western cultures are congruent with the religious values in Saudi Arabia, as Islam encourages the pursuit of knowledge. As Oyaid (2009) claimed, this would further contribute to a positive outlook towards

computer-based devices and would assist teachers, particularly female teachers, to acquire the efficacy, skills and confidence needed to integrate new methods in the classroom.

In considering a more effective implementation of computer-based devices in the classroom environment in Saudi Arabia, Al Mulhim, (2014) stated that it is important for stakeholders in the field to promote a constructivist, more flexible learning environment. This means that Saudi Arabian educators would be expected to shift from traditional teaching strategies and methods, to student-centred learning, which has been proven to be effective in creating lifelong learners (Alrashidi & Phan, 2015). From the perspective of constructivist learning, it is argued by Saqlain, Al-Qarni, and Ghadi (2013) that students tend to construct knowledge in different ways depending on their preferences, interests, and differences in their method of acquiring learning. Therefore, educators in Saudi Arabia need to emphasise active participation by students in the self-led learning process.

Moreover, it has been argued by a number of authors (e.g. Alenezi, 2014; Le Renard, 2008; Meijer, 2017; Al Alhareth et al., 2015) that the successful implementation of computer-based devices in the Saudi Arabia classroom would be associated with a distinct perception of benefit to student learning outcomes, rather than simply a modernisation of teaching methods. In other words, the emphasis is upon technology implementation as a process, rather than a product. Researchers have considered the importance of integrating computer-based devices to address the specific academic needs of students (Saqlain, Al-Qarni, & Ghadi, 2013). In this way, the use of computer-based devices can lead to optimal results for students and the education system in Saudi Arabia.

2.4 Factors Related to Attitudes toward Classroom Computer Use

Albirini (2006) explained the relationship between computer attitudes and five independent variables. The findings indicated a strong positive correlation between computer attitudes and the five elements, which included computer attributes, cultural perceptions, computer competence, computer access, and computer-training background. Computer attributes that were associated with computer attitudes included the appearance, characteristics, and the elements of a computer.

Computer attributes determine the attitudes of teachers toward computers. These attitudes determine the willingness of teachers to use computers in classrooms for instruction purposes (Albirini, 2006).

Cultural perception is the general view held by people based on the acquired beliefs and norms within their society (Petkova, 2006). These views are often shared within a group, reflected in ways of thinking, and expressed in attitudes, methods of interacting with others, and with their environment. Among the factors that influence people's cultural perceptions are language, traditions, and religious affiliation. In the Saudi Arabia cultural paradigm, for example, religion, language, and tradition shape perception and attitudes, particularly toward new technology, such as computers (Oyaid, 2009). However, cultural perception undergoes constant evolution and change. Hence, perceptions and views may change over time.

Computer competence is the extent of one's knowledge in the field of computing. Competence in computer knowledge amongst teachers has a direct correlation with the ability to use computers effectively in their instructions. Teachers who are more competent in computing fields were found to employ computers in their instructions during teaching (Albirini, 2006).

Also, competent teachers have more interest in using computers in classroom settings, unlike less competent teachers.

Computer access refers to the availability of computer systems and its services. Inability to access computers is cited as a principal cause preventing teachers from using computers as aids in teaching and classroom instruction. Albirini (2006) also noted that inaccessibility of computers has been found to demotivate teachers from learning computer skills.

Computer training background refers to people having had the necessary training in computer technologies (Al Mulhim, 2014). It can also be described as the introduction to computers. A positive correlation exists between the attitudes of teachers and computer training background (Peluchette & Rust, 2005). Research has shown that teachers who have undergone computer training have more interest in integrating technology and teaching.

2.5 Barriers to the Use of Computer-Based Devices in Education

In spite of a clearly stated pro-computer-based devices policy at the national government level, Robertson and Al-Zahrani, (2012) claimed that Saudi Arabian schools and classrooms have been slow to acquiesce to the growing pressure to embed computer-based devices within the classroom. According to the authors, educational institutions need to be pro-active towards the implementation of proven technologies that can facilitate student outcomes. Therefore, it has become important for researchers to identify the barriers associated with the use of computer-based devices in the Saudi Arabian classroom. A few studies have considered the barriers to the implementation of computer-based devices in the classroom from the perspective of teachers. (e.g., Alrashidi & Phan, 2015)

By considering educators' opinions about the integration of computers in the education system, distinct insights of the teaching and learning process can be gained. Al Mulhim (2014), for instance, conducted a study of both teachers and students in 29 public and private schools in the Al-Qaseem region of the country. This research identified a number of barriers to the implementation of computer-based devices in the classroom, including insufficient access to appropriate equipment and software. Al Mulhim (2014) argued that there were three main impediments to the computer-based devices-driven classroom in Saudi Arabia – lack of access to computer-based devices, lack of training, and lack of time (Al Mulhim, 2014).

The lack of access to computer-based devices creates significant problems for Saudi Arabian teachers who are unable to demonstrate important theoretical concepts in an effective, visual manner. According to Saqlain, Al-Qarni, and Ghadi, (2013) the limited availability of educational software is problematic to educators and students alike in the Saudi education system. Lack of access to such technologies has also been found to contribute to insufficient levels of motivation among students. As a result, student performance tends to fluctuate, especially when students are expected to complete challenging academic tasks.

As pointed out by Al Mulhim (2014), the lack of training is a persistent barrier to computer-based devices use in the Saudi Arabian classroom. Some teachers do not have the necessary knowledge of educational technology, and thus they fail to connect with students in a more effective manner. Therefore, more training is needed in order to help teachers utilize diverse technological resources in the classroom. A greater focus on teacher training means greater confidence on the behalf of teachers to use technologies for various teaching purposes (Saqlain, Al-Qarni, & Ghadi, 2013).

A lack of time is also a barrier that should be considered in planning for a more effective implementation of computer-based devices in the Saudi Arabian classroom. Borg and Alshumaimeri (2012) found that an over-loaded curriculum and teaching schedule in many classrooms left teachers with insufficient time to integrate technologies into their teaching practice. Technology-oriented classes require additional time to enable teachers to utilise the technology and provide students with greater participation in their learning program. Furthermore, Al Mulhim (2014) contended that these barriers to the integration of technology in education are interrelated, and so recommended that, "teachers need to be released from their workload for a reasonable time to attend training without the fear of the accumulation of work when they go back to their schools" (p. 491).

Another barrier noted by Alturise (2016) is resistance to change, and an oppositional attitude towards the introduction of new pedagogies and the perceived slight to teachers' existing teaching styles. These factors contribute to the comparatively slow uptake of computer-based devices in Saudi students' learning (Alturise, 2016). As such, resistance to change can hinder the implementation of computer-based devices in the Saudi Arabian classroom. The process of using such technologies is associated with substantial changes in the educational setting. However, such changes imply that educators should exhibit different reactions (Lily, 2013). At the same time, it is essential to realize that resistance to change may not actually be a barrier in itself. Such resistance might be perceived as a sign of persistent conservatism in the educational environment of Saudi Arabia (Saqlain, Al-Qarni & Ghadi, 2013). This means that Saudi Arabian educators need to be more adaptable, more willing to accept new ideas, and more focused on enhancing their skills and knowledge, so that they can improve the implementation of computer-based devices in the classroom.

Another barrier identified by Lily (2013) is related to the lack of progressive evaluation. Ongoing evaluation is essential for establishing the effectiveness of any educational initiative. In Saudi Arabia, there is insufficient evaluation of teaching and student outcomes. Thus, it has become challenging to determine the precise impact of utilizing computer-based devices on learning. More research is needed to present adequate conclusions pertaining to the expected effectiveness of technology-based initiatives in the Saudi Arabian classroom.

2.6 Teachers' Attitudes Towards e-learning

Recent literature on computer-based devices implementation in Saudi schools has helped to reveal various other obstacles facing the Government's stated policies on education reform. For example, Alzamil (2003) examined high school social studies teachers' attitudes towards using instructional technology in Saudi Arabia. The results revealed that teachers had a positive attitude towards using instructional technology. This illustrates a significant shift in teachers' way of thinking since they were mostly focused on providing adequate opportunities for student engagement and learning. This study indicated that teacher attitudes towards the use of instructional technology over a decade ago were positive. The present study examined whether teacher attitudes towards computer-based devices have changed recently.

However, teachers in Alzamil's study also reported that a lack of resources, opportunities to learn about computers, and a lack of school and district support diminished their potential use of instructional technology. A thorough consideration of these factors can help practitioners in the field establish effective strategies to address the persistent challenges emerging in the Saudi Arabian classroom (Saqlain, Al-Qarni, & Ghadi, 2013). Al-Oteawi (2002) found that most teachers who showed negative or neutral attitudes toward the use of computer-based devices in education lacked knowledge and skills about using computers. Al-Busaidi and Al-Shehri (2010)

determined some challenges to the use of computer-based devices in Saudi Arabia, such as the budgetary allocation to computer-based devices, the knowledge and skills of teachers and learners, the infrastructure for technology and telecommunications, and the organisational relationship of all those involved in e-learning.

As positive attitudes towards computer technologies significantly predict effective use of e-learning technologies (Albirini, 2006), policymakers can utilise teachers' attitudes toward technology to better prepare them for the employment of computer technology in their teaching methodologies (Albirini, 2006). Given that teachers are the core determining agent in effective utilization of computers in institutions (Alaugab, 2007), it is essential to gain a grasp of their attitude. Hence, examining teacher attitudes could provide reasonable explanations towards some questions relating to their employment of technology in teaching and learning.

Several studies, including some from Middle Eastern nations, have shed light on relationships between attitudes towards computer technologies and teachers' demographic characteristics, for instance age (Ahadiat, 2008; Xu & Meyer 2007), teaching experience (Alaugab, 2007), period of computer technology experience (Sahin & Thompson, 2006), highest degree awarded (Xu & Meyer, 2007), familiarity with the internet (Alaugab, 2007; Xu & Meyer, 2007). For example, age and attitude towards technology have been found to be negatively correlated: the older the teacher, the lower their level of computer skills and the poorer their attitude towards learning about these important tools. Saqlain, Al-Qarni, and Ghadi (2013) found that younger teachers demonstrated a high level of motivation and flexibility in the adoption of diverse technological tools to support their teaching practice. At the same time, younger teachers were the most likely to experiment with different forms and strategies of teaching, as they also modified their instructional approaches in line with students' academic needs and expectations.

Consequently, older teachers require more training to employ computers proficiently and to develop the confidence needed for an improved attitude.

In a similar vein, the number of years of teaching experience was found by Ahadiat (2008) to be negatively related with teacher attitudes toward technology and computers. Thus, teachers with more years of teaching experience tended to rely on traditional methods of teaching while rejecting newer, technology-based approaches. Furthermore, Shahin and Thompson (2006) reported that having sufficient computer experience was an important factor influencing teachers' positive attitudes toward computer technologies. These findings may have special relevance to circumstances in Saudi Arabia where academic standards of teachers and demographic characteristics differ from those in many other countries. Teachers are the key to effective utilization of computer technology in the classroom. Therefore, an understanding of teachers' attitudes and the factors that influence these attitudes in the context of Saudi Arabia will assist in informing improved strategic planning for the future of education.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

A quantitative approach was used to explore the attitude of Saudi teachers regarding using computer-based devices in the classroom. An online survey was used to gather data from approximately 2000 in-service secondary teachers. Since little is known about the use of computer-based devices in Saudi Arabia, an exploratory quantitative investigation was warranted. The design of this research was the implementation of a descriptive and comparative approach, which was considered as most suitable to address the research questions.

Descriptive research is useful in the extensive exploration of diverse educational challenges (Gay & Airasian, 2003). The focus was on investigating participants' views and perspectives on the issue of implementing computer-based devices in the Saudi Arabian classroom. Gay and Airasian (2003) stated that descriptive studies are "useful for investigating a variety of educational problems, and concerned with assessing attitudes, opinions, preferences, demographics, practices, and procedures" (p. 277). Therefore, the use of descriptive statistics was considered relevant since the researcher was concerned with finding out participants' attitudes towards the utilisation of computer technologies that could facilitate the teaching and learning process. According to Fraenkel and Wallen (2006), in comparative studies, researchers aim to specify the exact causes of differences that exist among individuals. In this way, a substantial amount of evidence was investigated to make solid inferences regarding the implementation of computer-based devices in Saudi Arabian schools.

3.2 Participant Sample

The research population was restricted to secondary teachers from schools in the Taif region of south-western Saudi Arabia. This population was selected because of the emphasis by the Saudi Arabian government's new policy, which aims to integrate computer-based devices in secondary education curriculum (Oyaid, 2009). Accordingly, schools in the region are moving towards applying technological tools quickly in response to the policy initiative and expectations within Saudi society. Furthermore, development issues and concerns about the importance of computer-based devices in education at the global and local levels are becoming more prominent in the discourse of pedagogical issues.

Participants were volunteers from a population of approximately 2,000 in-service teachers from all secondary schools in the Taif region of south-western Saudi Arabia. They were invited to participate in the study by providing them with a link to the questionnaire, which was electronically sent to teachers by school principals.

3.4 Data Collection Methods: Questionnaire

The researcher used one online questionnaire for data collection. The questionnaire consisted of close-ended questions that provided multiple-choice response options that included a modification of the Computer Attitude Scale (CAS) questionnaire (Loyd & Loyd, 1985). The questionnaire method was the most appropriate means to gather data from the research participants, who were teaching in schools dispersed over a wide geographic area. The Ministry of Education authority in Taif region distributed the questionnaire to school principals, who then sent the questionnaire to the teachers. Furthermore, this method ensured a wide coverage of potential participants in the shortest possible time.

The researcher through the website, Survey Monkey, https://www.surveymonkey.com, administered the survey instrument, which consists of a number of demographic questions, Likert scale items, and open-ended items. Survey Monkey is an effective online survey platform used by many professional, business, and academic researchers.

3.4 Research Ethics

Prior to conducting the research, approval to conduct the study was sought from the Social and Behavioural Research Ethics Committee (SBREC) of Flinders University in South Australia. In addition, permission was sought and granted from the Ministry of Education in Taif, Saudi Arabia (see Appendix A) to contact and collect data from the teachers (see Appendix B and C). Participation was voluntary as an information sheet was provided to all participants and the identities of teachers agreeing to participate would remain confidential. It is also important to note that participants did not receive any incentive or compensation for their participation.

3.5 Study Procedure

After receiving approval from the Social and Behavioural Research Ethics Committee (SBREC) of Flinders University in South Australia and getting permission from the Ministry of Education in Taif, Saudi Arabia to contact and collect data from the teachers, a link to the questionnaire was electronically sent to teachers through school principals. The electronic survey contained an Information Sheet (see Appendix E) that detailed the purpose of the study and the importance of the teachers' participation in the study. The survey asked teachers about their experiences and opinions of the policy of integrating computer-based devices in the classroom environment. Data were gathered over the spring of 2018 and completed within two months of initiation of the study.

3.6 Measurements

This study used one questionnaire, the Computer Attitude Scale (CAS) questionnaire (Loyd & Loyd, 1985) to measure secondary teachers' attitudes. The researcher, who is fluent in English and Arabic, translated it from English to Arabic. The questionnaire was provided in Arabic, the first language of the participants and the language they are most proficient in. The survey instrument can be seen in its entirety in Appendix E (English version), and Appendix F (Arabic version). To ensure the translation tool converted the questionnaire from its English form to its Arabic form and still maintained the same aspects of validity and reliability, the researcher confirmed the Arabic form with educators in the field who are skilled in Arabic language and also expert in the English language. The educators were particularly helpful in giving objective assessments of the research items and in ensuring the content was translated without losing the intended meaning. They found no significant differences between the two versions and suggested that no changes were required.

3.7 The Survey Instrument

The Computer Attitude Scale (CAS) questionnaire comprised of 40 closed questions with a 5-point Likert scale, which enabled the questionnaire to be completed quickly (Punch & Oancea, 2014). Since the focus was on gathering data in an objective, statistical manner, the use of this data collection method was considered optimal for achieving the specified research objectives.

An adaptation of the CAS, which was developed by Loyd and Gressard (1984) and Loyd and Loyd (1985) and was designed to measure attitude toward computers, was undertaken. As demonstrated in each item subscale, the original questions were modified to make them more contemporary to help the participants respond appropriately. Accordingly, the researcher

changed the tense to either simple present or simple future to indicate the contemporariness of the use of computers. For instance, the original statement, "Working with computers will make me very nervous" was modified to "Working with computers makes me very nervous." The modification of the tense was intended to minimize extreme responses from the participants and elicit answers that were generally authentic, unlikely to change, and relevant to the present study. Overall, the technique was instrumental in that it enabled researcher to collect up-to-date information regarding the attitudes of the respondents towards computer usage. The researcher dropped question 24 ("I can't think of any way that I will use computers in my career") from the questionnaire. This was because, in the contemporary era, almost everything in a teacher's career is done online, and there is no need to ask teachers about the possibility of using the computer or not in teaching.

The CAS instrument consisted of 40 items, and was divided into four 10-item subscales:

1) Computer anxiety (e.g., Computers do not scare me at all). Alsebail (2004) describes computer anxiety as the fear people hold towards learning and using computers.
2) Computer confidence (e.g., I am no good with computers). Computer confidence refers to the conviction in one's capability of learning and handling computer-based activities (Mangin, 2011).
3) Computer liking (e.g., I like working with computers). Loyd and Loyd (1985) define computer liking as a feeling of enjoyment in which people are willing to share their computer experiences with others.
4) Computer usefulness (e.g., I will use computers many ways in my life). According to Loyd and Loyd (1985), computer usefulness refers to a notion that computers are important components in life.

The CAS items use a 5-point Likert-type scale ranging from Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, to Strongly Agree = 5. Originally, for each subscale, the maximum score was 50 points and the minimum score was 10 points, except for the subscale Computer Usefulness (minimum = 9, maximum = 45). For the scale taken as a whole, the maximum score was 195 points and the minimum was 39 points. After conducting factor analysis, the new minimum and maximum score of each of the subscales are as follows: Computer anxiety (minimum = 7, maximum = 20), computer usefulness (minimum = 7, maximum = 25), Computer confidence (minimum = 16, maximum = 40), and computer liking (minimum = 15, maximum = 35).

Also included in the survey was an open-ended item that gave teachers the opportunity to provide comments in their use of computer-based devices in the classroom as well as their future use of computer-based devices in the classroom. The last part of the questionnaire collected the demographic data (e.g., age, years of teaching experience, and gender). The questionnaire data permitted a measure of positive as well as negative attitudes towards the use of computer technology in teaching. The way in which the questionnaire items were constructed helped the researcher gain important insights into the explored research topic. Both positive and negative attitudes were adequately analysed to find specific connections between themes and variables. The teachers' responses to these questions were expected to provide a better understanding of the suitability of computer-based devices and lead to methods for improving teacher attitudes to technology.

3.8 Pilot Study

A pilot study is typically used to assess participants' comprehension of the research questions. Ten secondary teachers, five teacher colleagues from two different schools in Saudi

Arabia from a population similar to those who participated in the actual study volunteered to test the instrument for the research. The link to the survey (in Arabic) was sent to them. Each respondent required approximately 10-15 minutes to complete the questionnaire.

All teachers successfully answered the questions that were contained in the questionnaire without any major challenges. Nevertheless, they suggested adding the item highest academic degree obtained by participants in participant demographics. Informed by the outcome of the pilot study, the researcher re-evaluated and improved the content of the questionnaire accordingly. For example, the researcher added the variable on the impact of education qualification in influencing teacher attitude towards ICT.

3.9 Data Collection

To collect the data, a link of the Arabic version of the questionnaire was electronically sent to teachers through school principals who in turn distributed the link to the teachers. The completed questionnaire data were electronically saved through the Survey Monkey platform.

During the two-month period of this study from 10th May to 29th July 2018, a total of 564 questionnaires were returned out of the 2,000 invited to participate for a response rate of 28.2%. This rate of return is consistent with or better than average response rates of 10-15% for typical external surveys conducted via electronic means (Fowler, 2013; Kaplowitz, Hadlock, & Levine, 2004; Sheehan, 2001). According to Holloway and Wheeler (2002), the size of a research sample may not necessarily affect the quality or importance of the research, but an adequate sample is an important aspect of any empirical study to enable a researcher to make reliable assumptions, inferences, and conclusions about a population.

3.10 Data Analysis

The data were entered into the software program SPSS version 25 for analysis. Data analysis involved the derivation of descriptive data (Punch & Oancea, 2014). Descriptive statistics, such as means, frequency, standard deviation, and percentages were used to describe the data. Cronbach's alpha tests (Creswell, 2012) were also used to assess the internal reliability of scaled measures, and appropriate action was taken by removing items accordingly where there was evidence of poor reliability, in order to increase reliability. For example, the item "Working with computers makes me very nervous" had a factor loading score of .36, and was removed due to its very low loading.

Responses to the open-ended question were examined to provide additional insight into the meaning of the data and were analysed for general ideas or themes. Due to lack of space for reporting a thematic analysis here, the researcher has used the answers from the open-ended question only in relation to the first research question, namely secondary teachers' attitudes toward computer-based devices in the classroom environment in Taif, Saudi Arabia and for further insight to answers addressing the third research question (i.e., What additional information do teachers have for describing their experiences using computer-based devices in their classroom?). The open-ended question sought to solicit further comments from the participants concerning their experiences with ICT in school. Thematic analysis (Braun & Clarke, 2006) was used to organise teacher responses into themes.

Attitudes were measured using the mean score derived from the Computer Attitude Scales (CAS). The CAS includes five scores: the total computer attitude scale, and subscales of computer anxiety, computer confidence, computer liking, and computer usefulness. Descriptive analysis of means and standard deviations of the computer attitude scale and its subscales were

used to analyse the first research question (i.e., In Taif, Saudi Arabia, what are secondary teachers' attitudes toward computer-based devices in the classroom environment?).

A one-way ANOVA was used to determine whether there were significant differences in secondary teachers' attitudes toward computer technologies (total attitude, computer anxiety, computer confidence, computer liking, and computer usefulness) and demographic variables. However, because the thesis was limited in terms of size, I only focused on four variables: age, years of teaching experience, years of computer experience, and gender, which were examined for group differences. These demographic variables were selected because they are important determinants of teachers' attitudes towards the computer-based devices in the classroom context (e.g., see Ahadiat, 2008; Alaugab, 2007; Sahin & Thompson, 2006; Xu & Meyer, 2007).

CHAPTER FOUR: RESULTS

4.1 Participants

Overall, data from 559 teachers were analysed in this study. Any survey that had five or more missing items in the demographic part was excluded because the demographic items would be used in answering one research question. Therefore, five surveys were excluded, and a total of 559 out of 564 surveys were used in this study.

4.1.1 Gender.

Table 4.1 shows how the proportion of the participants was distributed according to gender. Most of the participants (85.5%, n= 478) were female teachers while (14.5% (n= 81) were male. This gender disproportion was expected because the participants surveyed consisted of more female teachers than males. This aspect of the research is discussed further in the section on limitations.

Table 4.1

Gender of Participants

Gender	Frequency	Percentage
Female	478	85.5
Male	81	14.5
Total	559	100.0

4.1.2 Age of participants.

Of the respondents (n = 559), 94.6% (n = 529) were over the age of 30. Furthermore, the majority of teachers (n=511 or 91.4%) were aged between 30 and 49 years. Table 4.2 summarizes the results of the age distribution of the participants.

Table 4.2

Participants' Age

Age	Frequency	Percentage
20-29	30	5.4
30-39	324	58.0
40-49	187	33.5
50-59	18	3.2
Total	559	100.0

4.1.3 Numbers of years in teaching experience as a teacher.

Table 4.3 shows the distribution for the number of years of teaching experience of the respondents. Of the respondents (n = 559), 79.6% (n = 445) had 6 years or more in teaching experience at the secondary school level. Teaching experience ranged from less than a year to more than twenty years. As shown in Table 4.3, 8.8% of the respondents had a 1-year experience, while 11.3% had less than 5 years' experience, 24.9% had 6-10, 24.0% had 11-15, 12.7% had 16-20, and 18.4% had more than 20 years' experience.

Table 4.3

Numbers of Years of Teaching Experience as a Teacher of Participants

Years	Frequency	Percentage
Less than 1 year	49	8.8
Less than 5 years	63	11.3
6-10	139	24.9
11-15	134	24.0
16-20	71	12.7
More than 20	103	18.4
Total	559	100.0

4.1.4 Number of years of experience with computer technology.

The distribution for the number of years of experience the respondents had with computer technology is presented in Table 4.4. Of the respondents (n = 559), 51.2% (n = 286) had more than 10 years of experience with computer technology. Of the total, 24.9 % (n= 139) participants reported using computer technology for 4-5 years. Only 5.5% of them specified the number of years of experience with computer technology, whereas 3.4% of the participants used technology for 11-15 years, 1.8% used computer technology for 16-20 years, and 0.4% used computer technology for 21-30 years.

Table 4.4

Participants' Years of Experience with Computer Technology

Years	Frequency	Percentage
Less than year	89	15.9
1-3	39	7.0
4-5	139	24.9
6-10	6	1.1
More than 10	286	51.2
Total	559	100.0

4.1.5 Highest academic degree obtained by participants.

Of the respondents (n = 559), the majority, 395 (70.6%), had obtained a Bachelor of Teaching Degree, while 27.7% were Master of Education graduates. Only 1.6 % of the participants were Doctor of Philosophy holders. Considering that all participants held at least a bachelor's degree, with more than one quarter holding a master's degree or PhD, it is apparent that the participants were well educated. Table 4.5 summarises the results of the distribution for the highest academic degree obtained by the participants.

Table 4.5

Participants' Academic Degrees

Academic Degree	Frequency	Percentage
Bachelor of Teaching	395	70.7
Master of Education	155	27.7
Doctor of Philosophy	9	1.6
Total	559	100.0

4.1.6 Using computer at home.

Table 4.6 summarizes the distribution of the respondents by their usage of computer at home. Of the total respondents (n = 559), 42.6% (n= 238) reported that they often use computers at home. Moreover, only 1.8% (n= 10) of the respondents indicated that they had not used computers at home. This shows that the majority of the teachers had regular access to a computer in their place of residence, which helps to explain why most of the respondents are familiar with using computers.

Table 4.6

Participants' Computer use at Home

Level	Frequency	Percentage
Many times	177	31.7
Repeatedly	238	42.6
Sometimes	81	14.5
Rarely	53	9.5
I do not use it	10	1.8
Total	559	100.0

4.1.7 Using computer at office.

Table 4.7 summarises the distribution of the respondents by their usage of a computer at an office. Of the respondents (n = 559), 40.3% (n= 225) reported that they are repeatedly using a

computer at office. Nevertheless, 8.4% (n= 47) of respondents reported that they had not used computers at their respective offices. This suggests that most of the participants have a history of using computers at their offices.

Table 4.7

Participants' Computer Use at the Office

Level	Frequency	Percentage
Many times	182	32.6
Repeatedly	225	40.3
Sometimes	76	13.6
Rarely	29	5.2
I do not use it	47	8.4
Total	559	100.0

4.1.8 Using the Internet at home.

Out of the total number of respondents, 53% of the respondents (n = 296) reported having repeatedly used the Internet at home. Noteworthy is that none of the participants indicated they had never used the Internet at home (see Table 4.8).

Table 4.8

Participants' Use of the Internet at Home

Level	Frequency	Percentage
Many times	296	53.0
Repeatedly	200	35.8
Sometimes	33	5.9
Rarely	30	5.4
Total	559	100.0

4.1.9 Using the Internet at the office.

Of the total respondents (n = 559), 229 (41%) did use the Internet many times at their office. Table 4.9 below summarizes the results of using the Internet at the office as reported by the respondents. As shown in Table 4.9, only 4.3% (n= 24) of participants did not have access to the internet at their office.

Table 4.9

Participants' Internet Use at the Office

Level	Frequency	Percentage
Many times	229	41.0
Repeatedly	171	30.6
Sometimes	107	19.1
Rarely	28	5.0
I do not use it	24	4.3
Total	559	100.0

4.1.10 Participants' Computer skill level.

Table 4.10 summarises the distribution of the respondents by their computer skill level. Of the total respondents (n = 559), 63.9% (n= 357) reported that they were proficient when using computer technologies, and a further 12.0% (n= 67) stated that their computer skills were very proficient. This suggests that a significant majority (75%) of the study group considered themselves to be skilled and competent in using computer-based devices.

Table 4.10

Participants' Computer Skill Level

Skill level	Frequency	Percentage
Very proficient	67	12.0
Proficient	357	63.9
Beginning	135	24.2
Total	559	100.0

4.2 Scale Testing

Factor analysis was conducted to determine item loadings. As a result, Table 4.11 shows the items that have been retained. These items all have a loading score above 0.60

Table 4.11 *Factor Analysis Data*

Rotated Component Matrix[a]

	Computer confidence	Computer usefulness	Computer anxiety	Compute r liking
Q4. I will use computers many ways in my life.	.81			
Q6. Generally, I feel OK about trying a new problem on the computer.	.78			
Q10. I don't think I would do advanced computer work.				.85
Q11. I think working with computers would be enjoyable and stimulating.				.79
Q12. Learning about computers is worthwhile.	.82			
Q14. I am sure I work with computers.	.81			
Q15. Figuring out computer problems does not appeal to me.		.95		
Q19. When I have a problem with a computer that I can't immediately solve, I stick with it until I have the answer.	.81			
Q20. I expect to have little use for computers in my daily life.		.90		
Q22. I am sure I could learn a computer language.	.73			
Q23. I don't understand how some people can spend so much working with computers and seem to enjoy it.		.89		
Q24. I would feel at ease in a computer class.	.80			
Q25. I think using a computer would be very hard to me.		.95		
Q26. Once I start to work with computer, I find it hard to stop.			.74	
Q27. Knowing how to work with computers will increase my job possibilities.	.82			
Q28. I get a sinking feeling when I think of trying to use a computer			.81	
Q29. I could get good grades in computer courses.	.66			
Q32. I would feel comfortable working with a computer.	.73			
Q33. I do not think I could handle computer courses.				.87
Q34. If a problem is left unsolved in a computer class, I would continue to think about it afterward.			.73	
Q35. It is important to me to do well in computer classes.	.78			
Q36. Computers make me feel uneasy and confused.			.52	
Q37. I have a lot of self-confidence when it comes to working with computers.	.66			
Q38. I do not enjoy talking with others about computers.				.90

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Computer confidence	Computer usefulness	Computer anxiety	Compute r liking

Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Cronbach's Alpha reliability test was used to test the internal reliability of CAS. The test result was alpha = 0.88 which is considered a good level of reliability (Bryman, 2001). This confirms that the forty items that made up the attitude scale were highly consistent and could be used to measure attitudes toward computer-based devices. The score for computer anxiety was a little low, but close enough to 0.70, and thus was acceptable. Table 4.12 presents the Cronbach's Alpha test results for each subscale.

Table 4.12

Cronbach's Alpha Test of Attitudes

Items	**Values**
Computer anxiety	0.69
Computer confidence	0.78
Computer liking	0.75
Computer usefulness	0.81
Overall	0.88

4.3 Analysis of Research Questions

4.3.1 Research question 1

- **What are secondary teachers' attitudes toward computer-based devices in the classroom environment?**

Computer anxiety. The mean score of Computer Anxiety was 15.34, which is within the range for the average level of anxiety (see Table 4.13). Thus, participants in this study were neither too

anxious nor too relaxed towards computers and their use (see Figure 4.1). At this level, the score of 18 scored the highest at 15.3% while score 9 scored the least at 1.5 %. Total score with strongly agree on computer anxiety was 54.2% and 22.4 % for agree (see Figure 4.2).

Table 4.13

Means and Standard Deviations of Teacher Attitudes toward each subscale.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Anxiety_Total	557	7.0	20.0	15.3	3.0
Usefulness_Total	557	7.0	25.0	17.8	4.7
Confidence_Total	555	16.0	40.0	29.4	4.8
Liking_Total	557	15.0	35.0	26.2	3.2
Valid N (listwise)	551				

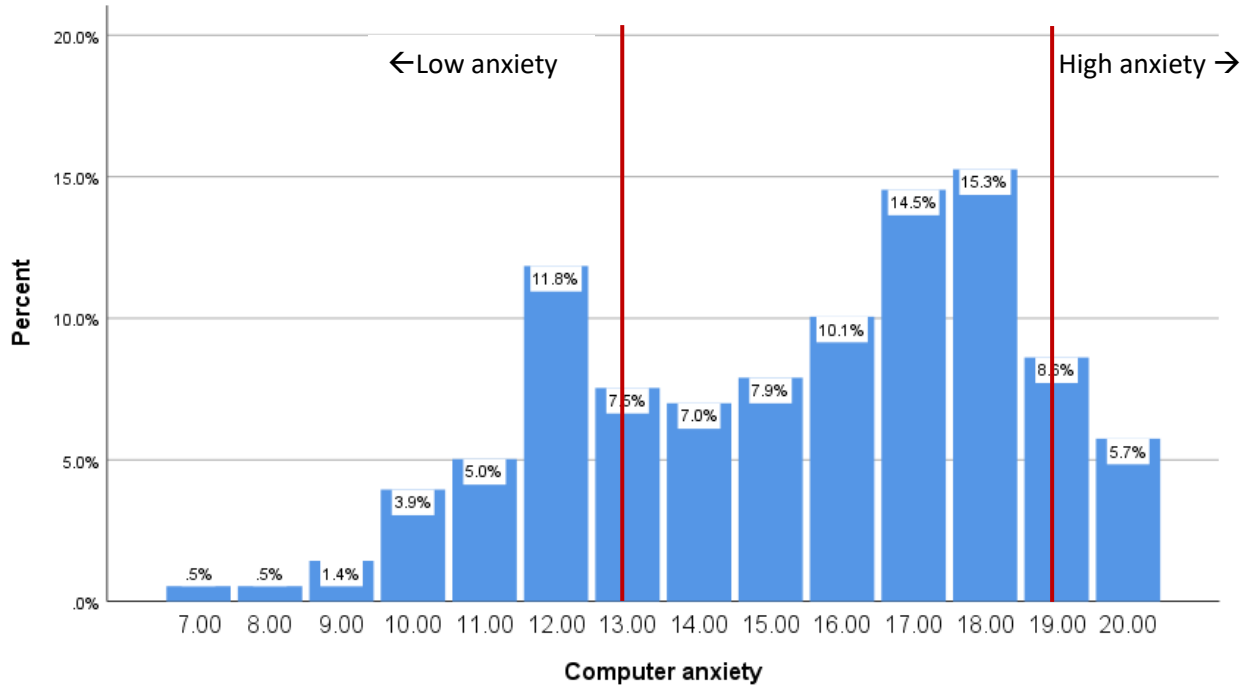


Figure 4.1. Histogram showing the distribution for the subscale "computer anxiety"

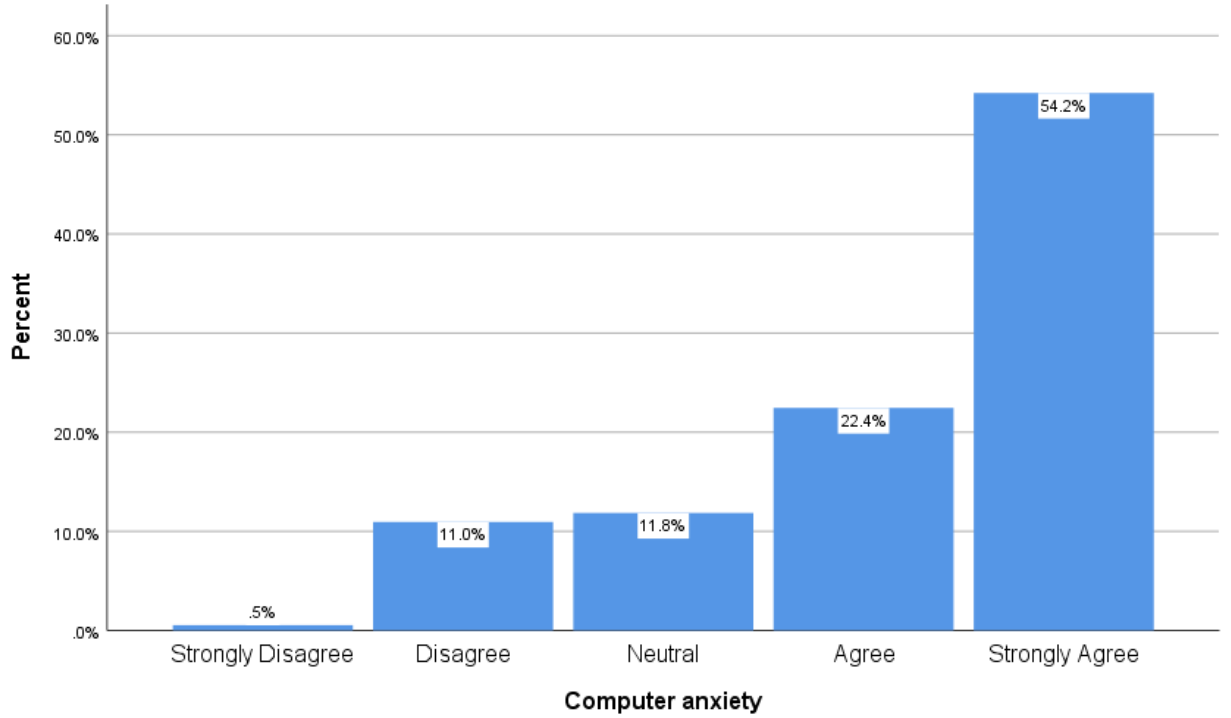


Figure 4.2. Distribution of the agreement score for the subscale "computer anxiety"

Computer confidence. The mean score of *Computer Confidence* was 29.4, which is within the range for the average level of confidence (see Table 4.13). The lowest scores were 16 and 19 both at 1.1% while the highest was 29.0 at 9.4 %. This score range and the respective percentages indicate that only a few participants were less confident about using computer devices. Noteworthy is that scores from 21 to 40 were found amongst 2% and 9.7% of participants, implying that most of the participants were confident in using computer devices (see Figure 4.3) As shown in Figure 4.4, approximately four out of five (82.0%) participants agreed (43.8%) or strongly agreed (38.2%) that they were confident about using computers.

The scores under the subscale *Computer Confidence* (M = 29.4, Mdn = 30, SD = 4.7) had a range of 24 with the minimum score being 16 and the maximum at 40. Descriptive statistics were used to operationally define the levels of the subscale, wherein, +/- of the SD (4.7) and the Mdn (30) would generate the levels of *Computer Confidence* (below average <25.2, average =25.2 to 34.7, and above average >34.7) (see Figure 4.3).

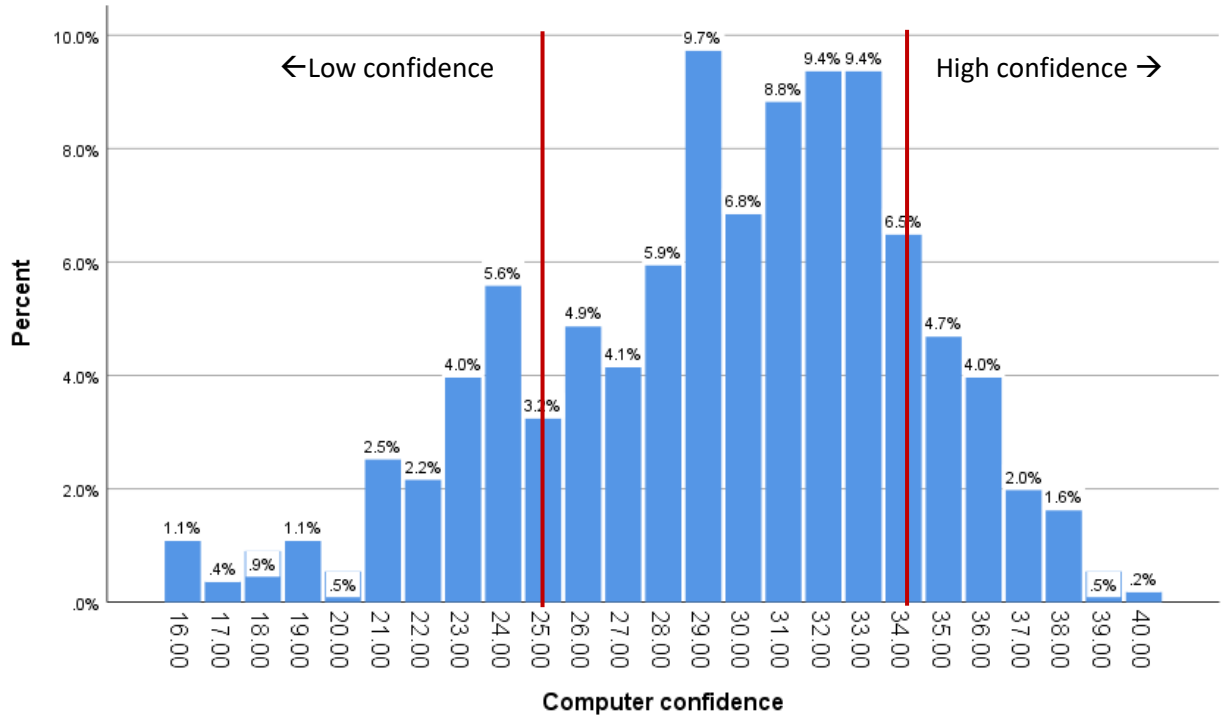


Figure 4.3. Histogram showing the distribution for the subscale "computer confidence"

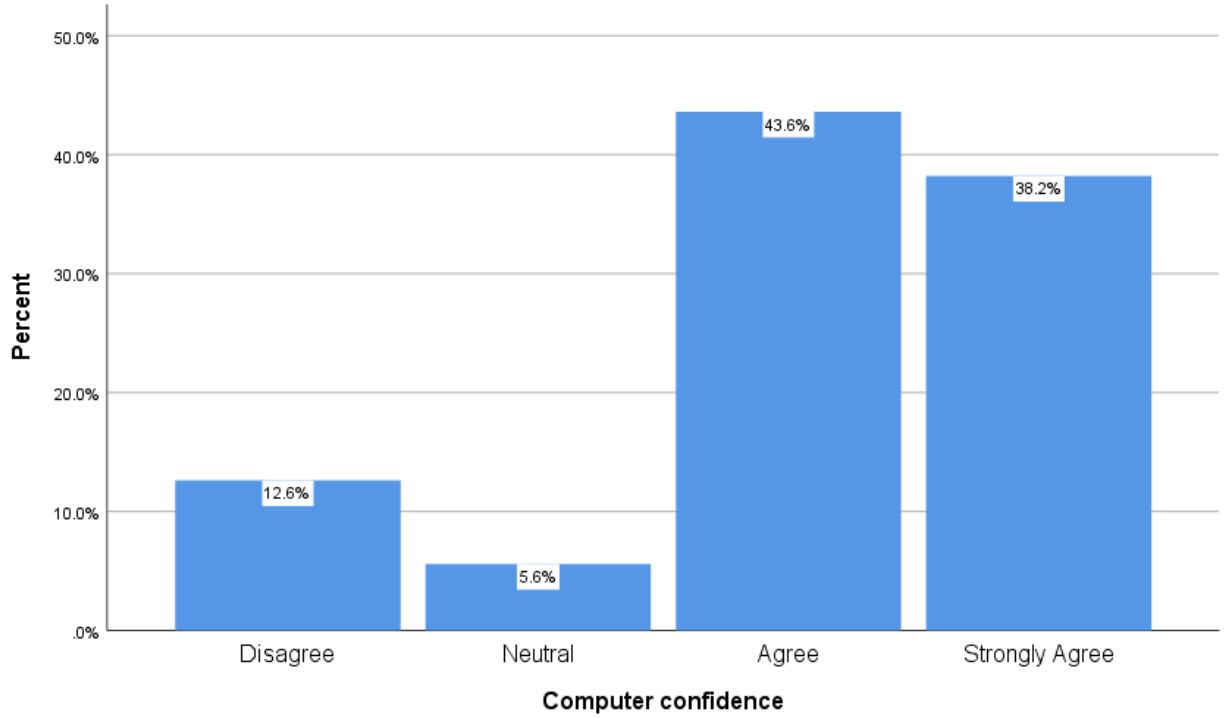


Figure 4.4. Distribution of the agreement score for the subscale"computer confidence"

Computer liking. The mean score for the *Computer Liking* subscale was 26.2, which is within the range for the average level of liking (see Table 4.13). The least scores were 23 and 25 both at 4%, while the highest were 25 and 27 both at 1.6%. This score range and the respective percentages indicate that only a few participants dislike using computer devices. Interestingly, scores above 30 had a range between 2% and 14.8% of participants, implying that most of the respondents feel average liking toward computer devices (Figure 4.5). In reference to Figure 4.6, three out of five participants or 61% agreed, while 33.4% strongly agreed.

For the *Computer Liking* subscale (M = 26.2, Mdn = 26, SD = 3.2), the scores had a range of 20 with the minimum score being 15 and the maximum at 35. Descriptive statistics were

used to operationally define the levels of the subscale, wherein, +/- of the SD (3.2) and the Mdn (26) would generate the levels of *Computer Liking* (<22.7, average = 22.7 to 29.2, and above average > 29.2) (see Figure 4.5).

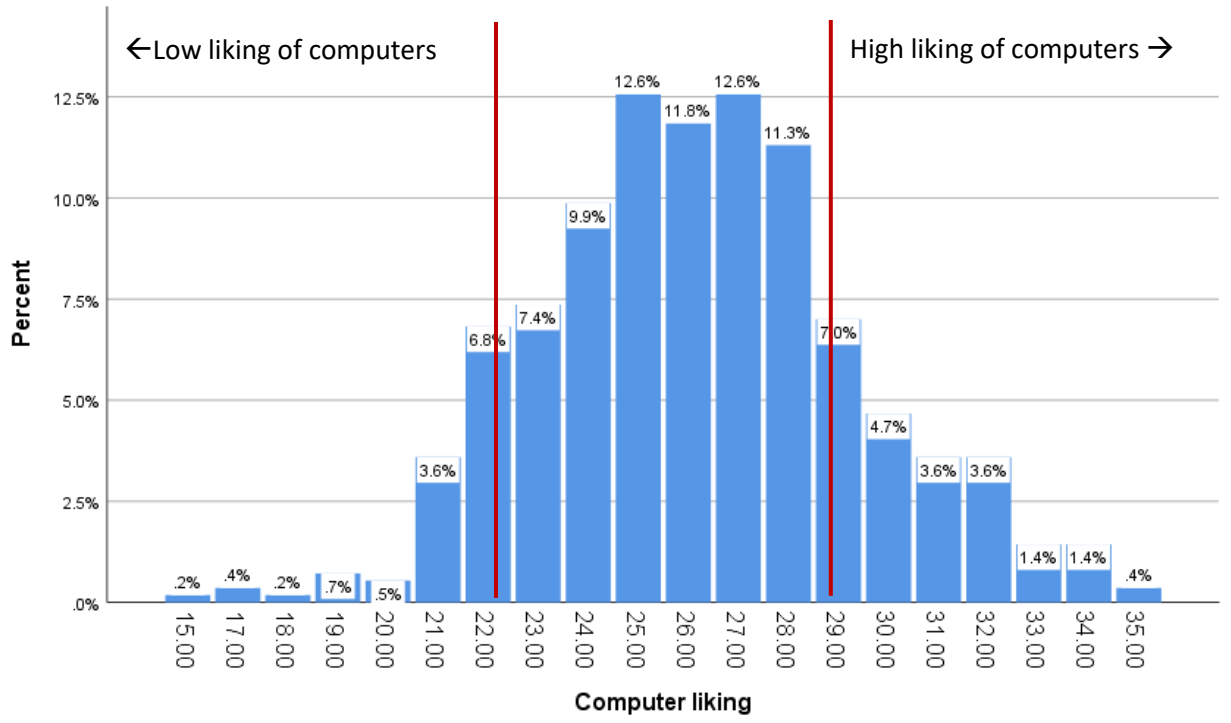


Figure 4.5. Histogram showing the distribution for the subscale "computer liking"

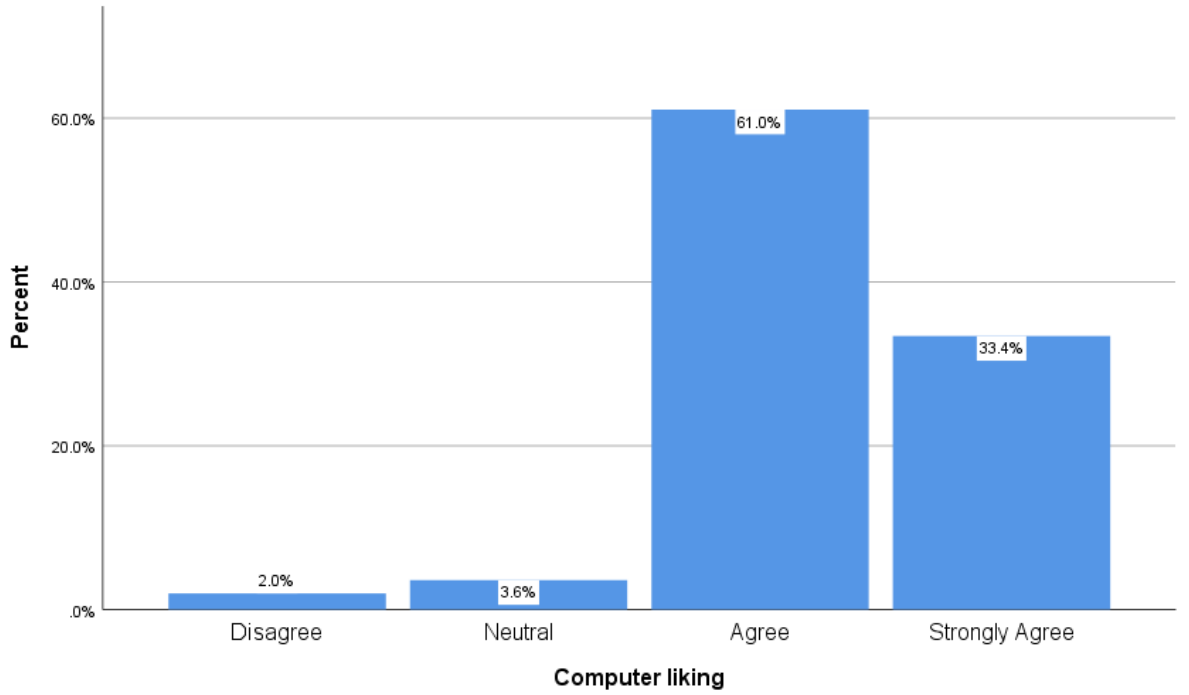


Figure 4.6. Distribution of the agreement score for the subscale"computer liking"

Computer usefulness. The mean score for *Computer Usefulness* was 25, which is within the average level of usefulness (see Table 4.13). The lowest score was 25 at 0.9% while the highest was 20 at 13.6%. This score range and the respective percentages imply that the majority of the participants considered computers as useful teaching components. Notably, scores from 14 to 24 had percentages between 3.3% and 13.6%, which confirms the positive attitudes most of the teachers had towards computer usefulness (see Table 4.13). In reference to Figure 4.8, two out of five (22.4%) agreed while four out of five (49.6%) strongly agreed.

The scores for the subscale *Computer Usefulness* (M = 17.1, Mdn = 19, SD = 4.7) had a range of 18 with the minimum score being 7 and the maximum at 25. Descriptive statistics were used to operationally define the levels of the subscale, wherein, +/- of the SD (4.7) and the Mdn

(19) would generate the levels of *Computer Usefulness* (below average <14.3, average = 14.3 to 23.7, and above average > 23.7) (see Figure 4.7).

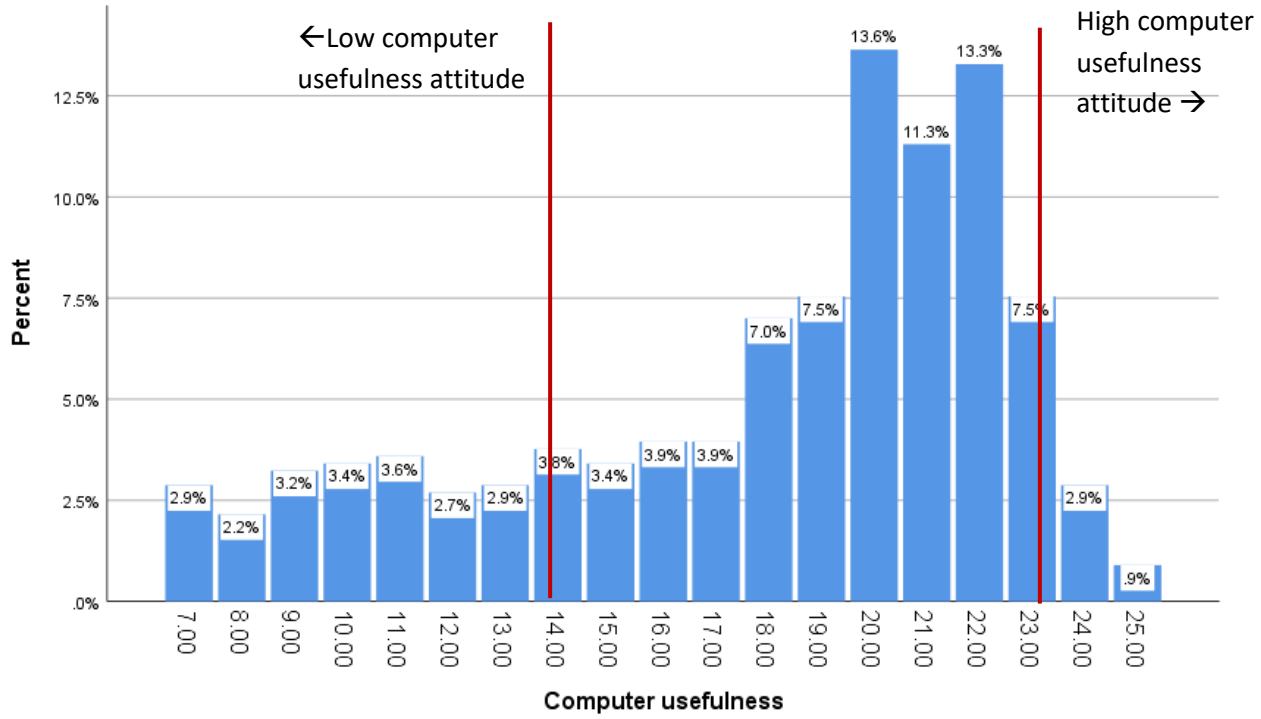


Figure 4.7. Histogram showing the distribution for the subscale "computer usefulness"

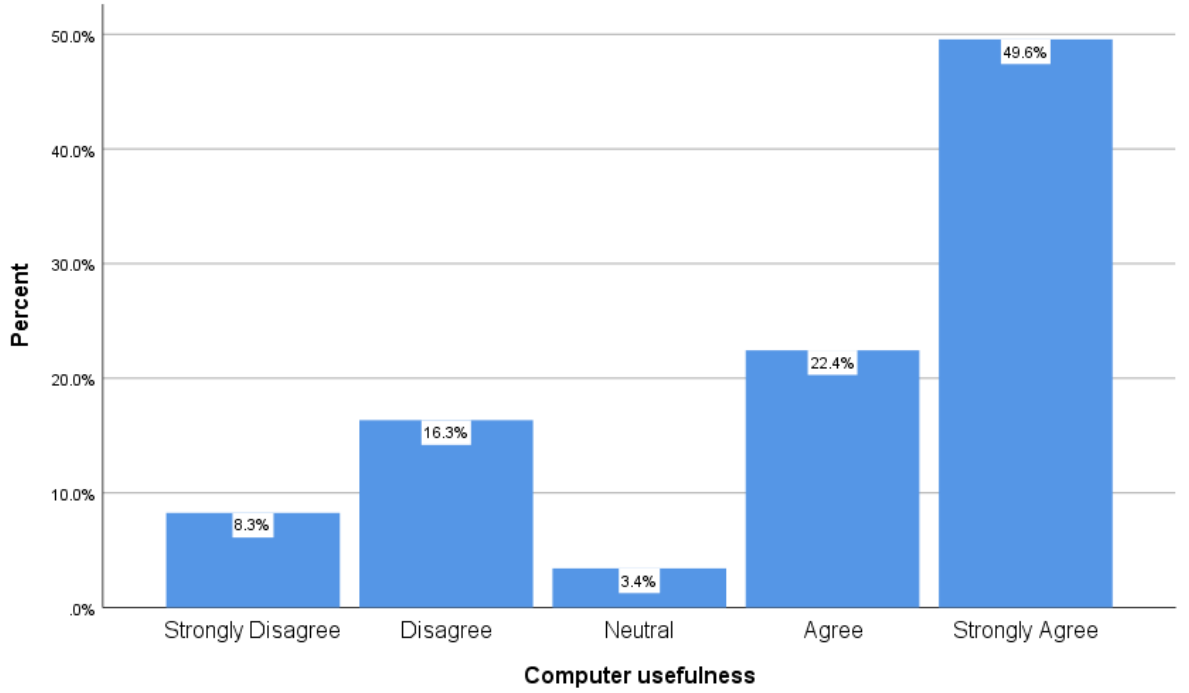


Figure 4.8. Distribution of the agreement score for the subscale"computer usefulness"

Summary of Research Question 1

As demonstrated by the analysis of the data, all the subscales were rated by participants within average mean scores. By being within the average score, these means scores for the four variables demonstrated that on average, teachers held positive attitudes towards computer usage in schools.

About half of the participants (49.6%) strongly agreed that computers were useful. Approximately one-third of the participants (33.4%) strongly liked computers, while just over one third (38.2%) showed confidence in computers. Over half of the participants showed anxiety towards computers. On average, over two in three (68.0%) participants strongly agreed with all the four subscales under investigation (see Figure 4.9).

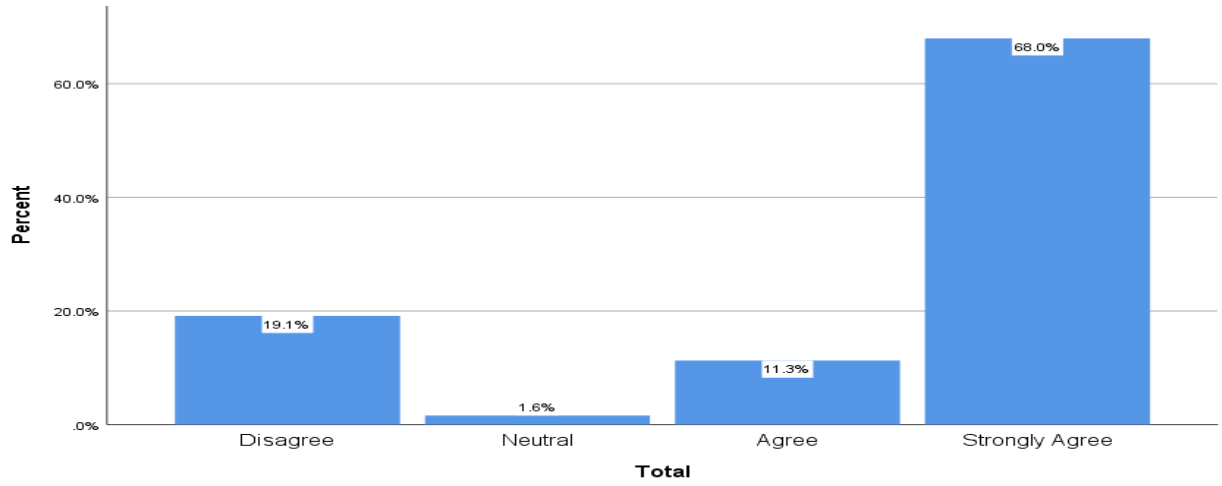


Figure 4.9. Scores for all the four subscales combined.

4.3.2 Research question 2

- **Do teachers' attitudes vary by teacher background, such as years of teaching experience, gender, or age?**

Computer attitude scale by age

A one-way ANOVA revealed that there were no statistically significant differences (F (3) = .672, p > .05), (F(3) = .734, p > .05), (F(3) = .809, p > .05), (F (3) = .031, p > .05) respectively in secondary teachers' computer anxiety, confidence, liking and usefulness based on age (see Table 4.14).

Table 4.14

Computer Attitudes by Secondary Teachers' Age

	Age	N	M	SD	DF	F	P
Computer anxiety	20-29	30	15.8	2.7	3	.672	.570
	30-39	323	15.4	3.1			
	40-49	186	15.2	3.0			
	50-59	18	14.6	2.7			
	Total	557	15.3	3.0			
Computer confidence	20-29	30	29.8	5.43	3	.734	.532
	30-39	321	29.2	4.65			
	40-49	186	29.8	4.95			
	50-59	18	29.1	4.02			
	Total	555	29.4	4.77			
Computer liking	20-29	30	26.6	3.1	3	.809	.489
	30-39	324	26.1	3.2			
	40-49	185	26.4	3.2			
	50-59	18	26.9	2.6			
	Total	557	26.2	3.2			
Computer usefulness	20-29	30	17.5	5.0	3	.031	.993
	30-39	322	17.8	4.7			
	40-49	187	17.8	4.6			
	50-59	18	17.7	4.4			
	Total	557	17.8	4.7			

Note. N = sample size, M = mean, SD = standard deviation, F = value of Fisher's test, P = P-value.

Years of teaching experience

Teaching experience did not appear to make a significant difference ($F(5) = .859$, $p > .05$), ($F(5) = 0.922$, $p > .05$), ($F(5) = .267$, $p > .05$), ($F(5) = .253$, $p > .05$) respectively with regard to secondary teachers' computer anxiety, confidence, liking and usefulness (see Table 4.15).

Table 4.15

Computer Attitudes by Teaching Experience

	Teaching experience	N	M	SD	DF	F	P
Computer anxiety	Less than year	49	15.7	3.0	5	.859	.508
	Less than 5 years	63	15.3	2.9			
	6-10	138	15.3	3.0			
	11-15	134	15.4	2.9			
	16-20	71	15.6	3.2			
	More than 20	102	14.9	2.9			
	Total	557	15.3	3.0			
Computer confidence	Less than year	49	28.7	5.3	5	.922	.466
	Less than 5 years	63	30.0	4.0			
	6-10	137	29.4	4.5			
	11-15	132	29.0	4.9			
	16-20	71	30.2	4.7			
	More than 20	103	29.2	4.9			
	Total	555	29.4	4.7			
Computer liking	Less than year	49	26.2	3.4	5	.267	.931
	Less than 5 years	62	26.3	3.0			
	6-10	139	25.9	3.2			
	11-15	133	26.3	3.2			
	16-20	71	26.2	3.3			
	More than 20	103	26.3	3.1			
	Total	557	26.2	3.2			
Computer usefulness	Less than year	49	17.4	5.0	5	.253	.938
	Less than 5 years	63	17.8	4.5			
	6-10	138	17.9	4.4			
	11-15	133	17.8	4.7			
	16-20	71	18.0	4.9			
	More than 20	103	17.4	4.8			
	Total	557	17.8	4.7			

Note. N = sample size, M = mean, SD = standard deviation, F = value of Fisher's test, P = P-value.

Years of computer experience

As shown in Table 4.16, there were no statistically significant differences (F (4) = 1.043, p > .05), (F(4) = .310, p > .05), (F(4) = .219, p > .05), (F (4) = .363, p > .05) respectively in secondary teachers' computer anxiety, confidence, liking and usefulness based on years of computer experience. Table 4.16

Computer Attitudes by Computer Experience

Computer	Experience	N	M	SD	DF	F	P
Computer anxiety	Less than year	89	14.8	3.0	4	1.043	.384
	1-3	39	15.5	2.5			
	4-5	139	15.6	2.8			
	6-10	6	16.1	3.4			
	More than 10	284	15.2	3.1			
	Total	557	15.3	3.0			
Computer Confidence	Less than year	89	29.0	4.4	4	.310	.872
	1-3	38	29.0	4.3			
	4-5	138	29.4	4.6			
	6-10	6	30.1	4.8			
	More than 10	284	29.5	5.0			
	Total	555	29.4	4.7			
Computer Liking	Less than year	89	26.1	3.2	4	.219	.928
	1-3	39	25.8	2.5			
	4-5	138	26.1	3.0			
	6-10	6	26.6	2.5			
	More than 10	285	26.3	3.3			
	Total	557	26.2	3.2			
Computer Usefulness	Less than year	89	17.4	4.6	4	.363	.835
	1-3	38	17.5	4.1			
	4-5	138	17.7	4.6			
	6-10	6	19.5	5.0			
	More than 10	286	17.9	4.8			
	Total	557	17.8	4.7			

Note. N = sample size, M = mean, SD = standard deviation, F = value of Fisher's test, P = P-value.

Gender

A one-way ANOVA revealed that there were no statistically significant differences (F (1) = .048, p > .05), (F(1) = .391, p > .05), (F(1) = .000, p > .05), (F (1) = .222, p > .05) respectively in secondary teachers' computer anxiety, confidence, liking and usefulness based on gender (see Table 4.17).

Table 4.17

Computer Attitude by Gender

Gender		N	M	SD	DF	F	P
Computer anxiety	Female	476	15.3	3.0	1	.048	.827
	Male	81	15.4	2.7			
	Total	557	15.3	3.0			
Computer confidence	Female	475	29.4	4.8	1	.391	.532
	Male	80	29.1	4.4			
	Total	555	29.43	4.7			
Computer liking	Female	476	26.24	3.2	1	.000	.998
	Male	81	26.24	3.1			
	Total	557	26.24	3.2			
Computer usefulness	Female	476	17.8	4.7	1	.222	.638
	Male	81	17.5	4.6			
	Total	557	17.8	4.7			

Note. N = sample size, M = mean, SD = standard deviation, F = value of Fisher's test, P = P-value.

4.3.3 Research question 3

At the end of the questionnaire, there was an open-ended question that was available for comments. The open-ended question was:

What additional information do teachers have that will enable understanding of their attitudes about using computer-based devices in their classroom?

The responses from participants to this open question were analysed qualitatively by first studying each narrative looking for themes with broader patterns of meaning to gain insights into attitudes (Braun & Clarke, 2006; Creswell, 2012). Stories were then compared and contrasted to identify differences and similarities leading to interpretations and evaluations of meaning, which could be related to the key data on attitudes. A coherent narrative including quotations reflecting the views and beliefs of the participants was then developed. In this analysis, most of the participants commented favourably about their experiences with and the perceived usefulness of computer-based devices in education; however, there were also references to obstacles and difficulties associated with the implementation of ICT in Saudi Arabia.

Over half of the participants provided comments that have the potential to increase an individual's computer confidence in the use of computer-based devices. For example, one teacher pointed out, "There is a need to support schools even at the primary level through the provision of computer devices and computer labs". There was also a consensus that a dearth of the relevant infrastructure and existing societal cultural beliefs towards technology are a major hindrance to computer usage in schools. For example, one respondent noted that,

"Computer access is the key barrier to embracing computer technology."

Finally, respondents noted that it is important to learn computer literacy and the use of technology in order to adapt to the future. As one respondent stressed,

"Computer literacy is key to adopting the increasingly changing technology."

One quarter or 25% of the participants left comments that were deemed valuable in increasing the usefulness of computers in teaching. For instance, one teacher noted,

> "Computers provide diversity in the learning process."

Another observed,

> "Computer usage increases understanding, strengthens students' skills and widens horizons of thinking them."

Yet another teacher noted,

> "One of the benefits of using a computer is to develop the educational process and improve it for the best by adding comfort and enhancing the learning skill outside the classroom."

One teacher gave a lengthy response by positing that,

> "Computer usage increases students' thinking skills and interaction, strengthens the relationship between teacher and student, improves the process of learning if used appropriately for the scientific subject, and makes testing easier."

Another teacher contemplated,

> "the adoption of technology will help students better receive education services and prepare them to global socio-economic environment."

Furthermore, 30% of participants believed that computer-based tools could help them address some of the most frequent challenges affecting students, such as boredom, disinterest, and difficulty in learning of complex concepts. Notably, one of the participants predicted,

> "Through ICT, the issues of boredom and disinterest among students will become a thing of the past."

Overall, the majority of teachers gave positive and insightful remarks concerning the importance of integrating computer usage in schools.

Finally, 15% of the respondents gave several comments related to the factors contributing to their liking of computers. One teacher in this category noted,

> "New apps make computer information fun."

Another contemplated,

> "Many teachers do not practice teaching with the computer, yet it enhances skills and draws the attention of students."

Overall, most of the teachers provided positive remarks about computer use in schools; however, there was still some objection to computers. A few participants concluded that teachers would be negatively affected by the use of computer-based devices in the classroom environment due to the additional work created and the already substantial burden of high student numbers in classrooms.

Some teachers expressed a view similar to the following

> "Handling computers during the preparation of practicals lessons is time-consuming and laborious as well. Extra labour is required to prepare practical computer lessons, and hence, that allocation should be catered for if teachers have to embrace the use of computers."

This observation could be because ICT classrooms in Saudi Arabia require the teachers to undergo further training to become acquainted with these devices.

4.4 Summary of the Results

The results of this study revealed that the surveyed teachers from Saudi Arabia have positive attitudes toward computer-based devices in the classroom. This conclusion is supported by the finding that all statements, which measured computer confidence, liking and usefulness of computers, achieved a high agreement percentage (Strongly Agree = 68.0%, Agree = 11.3%). However, the results did not suggest any statistically significant differences between teachers varying in age, gender, and teaching experience. In other words, similar attitudes towards computer usage in schools were held by all the teachers, regardless of their age, gender, or teaching experience.

CHAPTER FIVE: DISCUSSION

5. 1 Secondary Teachers' Attitudes towards Computer-Based Devices in the Classroom Environment

The findings revealed that most of the participants had a positive attitude towards using computers in offering educational services in Taif, Saudi Arabia. In addition, the CAS subscales (computer anxiety, computer confidence, computer liking, and computer usefulness), indicated positive attitudes toward using computer-based devices. This shift in collective perception towards computer usage in school is partly as a result of the increasing ease of access to ICT infrastructure in the country's learning institutions.

These results, therefore, suggest that the teachers were positive overall in their views on computers. Previous research has shown that a positive correlation exists between the competence levels of teachers in the use of computers and their attitudes toward computers (Peluchette & Rust, 2005). For example, research has shown that teachers who have undergone computer training, therefore increasing their competence, have attitudes that are more positive on the integration of technology with teaching (Al Mulhim, 2014). However, in this study, the analysis of the results revealed that the teachers showed more positive attitudes, firstly towards computer attributes, followed by cultural perceptions, and then computer competence, computer access, and training, in that order.

This positive attitude towards computer usage among teachers is consistent with the findings by Donovan, Hartley, and Strudler (2007), which found similar correlations among instructors towards ICT utilization in school. However, the finding contradicts some more recent studies like that of Fu (2013) which indicated a correlation between teacher demographics and

computer attitudes. Unlike the current study, which found no difference in attitudes to computers regardless of the years of experience, Fu (2013) found that "the more experience a user has with the technology the more he or she tends to accept it. The user acceptance may in turn promote learning" (p.119). On a similar note, Legris, Ingham, and Collerette (2003) found that experience with the internet increased positive attitudes about computers and web-based learning in education. This observation implies that the education sector in Saudi Arabia may improve integration of computer technology as more teachers become experienced with technology. The pace of change in digital technology use has been rapid, although the applications for pedagogy in Saudi Arabia, which require frequent monitoring and further research to fully understand how the developments are affecting education programs have not been as swift.

Previous studies have showed that a lack of required skills and confidence to use computer-based devices was the main reason why some teachers preferred conventional teaching methods (Bingimlas, 2009; Buabeng-Andoh, 2012). Put in other words, these outcomes are consistent with the current study in that they link positive attitudes towards computer devices with high confidence levels. Based on evidence from the current and previous studies, it is important to initiate programs intended to enhance teachers' attitudes towards computer usage. Therefore, for effective professional development in computer-based teaching, it is important to offer teachers the necessary training and incentives to boost their confidence in using these devices in teaching.

Teachers in this study identified the importance of engendering strong supporting policies for computer-based devices in education programs and ensuring that equipment and facilities are made available to students. Applied in the Saudi Arabian context, it will be important for the government to allocate resources appropriately for integration and periodic updating of devices.

Indeed, this observation is in line with the latest government budgetary allocation, which saw the Ministry of Education receive the second highest budget after the military. For the fiscal year, 2017/2018, the Ministry of Education received $53 billion for education and human resource development to support various activities including ICT infrastructure (International Trade Administration, 2018). Teachers also recognised that societal views on technology may hinder progress unless more attitudes that are positive are encouraged.

The responses of teachers in this study are consistent with those described in the study by Alturise (2017), who found a strong correlation between education policy support, teacher training, and positive attitudes toward computer-based devices in Saudi Arabia's teaching context. A closer examination of the outcome links the teachers' positive attitudes towards computer-based devices to the potential advantages they offer.

One of the aims of this study was to explore whether or not teachers' attitudes towards the use of computer-based devices had changed in the 12 years since Albirini's (2006) study of the technology initiative in Syrian education (agree = 69.9% , strongly agree = 20.7%). The results of my study suggest that the attitudes of Saudi teachers have positively changed (present result: agree = 11.3%, strongly agree = 68.0%) given the rapid proliferation of computer-based devices in the education sector and in society generally. Improved attitudes could be due to a number of key developments. For instance, the Ministry of Education has in the past few years prioritised the adoption of ICT in the school curriculum and has provided funding to support these policy initiatives. Furthermore, advances in the availability of computer technology and infrastructure in the wider Saudi context have taken place. Thus, these developments could help explain the divergence in the results of my research with previous studies.

The increasingly positive attitudes towards e-learning in Saudi Arabia could certainly be as a result of the government policy. Over recent years, the education policy has been advocating for the rapid adoption of computer-based learning in Saudi Arabian institutions of education. This policy is aimed at making the country more competitive relative to other major powers in the world (Alturise, 2017; Oyaid, 2009). Moreover, this shift could be attributed to the growing concern among the teachers that the adoption of the technologies may help them handle their duties with relatively greater ease. As noted in the study, the majority of participants believed that the adoption of technology tools in the education sector would assist them in providing instructions to students as well as preparing them for the global socio-economic environment. The findings further support the idea that the adoption of computer-based devices in the classroom environment would position Saudi Arabia well alongside developed countries. Furthermore, study participants believed that computer-based tools could help them address some of the most frequent challenges affecting students, such as boredom, disinterest, and difficulty in learning of complex concepts.

However, while in the open-ended question most teachers expressed positive attitudes, some still had some objections to computer use. For instance, they commented about work pressure on teachers and the number of students in classrooms, both of which may be excessive in some Saudi Arabian schools. These objections provide useful insights towards what needs to be done to further boost teachers' attitudes towards computer usage in schools. Making the number of computer devices compatible with student numbers in each class will not only make the teachers' work easier, but also enhance their positive attitudes towards computer usage.

Study findings suggest that the use of computers may be influenced by other factors, including unrelated challenges in the workplace. Some of the participants concluded that

teachers would be negatively affected by the use of computer-based devices in the classroom environment due to the additional work created and the already substantial burden of high student numbers in classrooms. Consequently, teachers' concerns about added workload and unmanageable student numbers may contribute to negative attitudes, and future research could test for this.

5.2 The Role of Background on the Teachers' Attitudes towards Computer-Based Devices

In my study, the age of teachers was not found to have an impact on attitudes when using computers. This outcome demonstrated that both younger and older teachers had the same positive perception concerning the attitudes of computers in school. This result is inconsistent with the findings from Mangin's (2011) study, which found a correlation between teachers' positive attitudes and younger age. Now some seven years later, it is apparent that age does not have such a significant influence on teachers' attitudes to computer usage in schools. It is apparent that most teachers now know the importance of computers, and they are using them regardless of their age. However, due to contrasting views from previous studies, there needs to be further investigation into this issue.

In most cases, it is believed that younger teachers are more able to keep pace with technological advancement than their older counterparts (Mangin, 2011). By the same token, my study findings revealed that a teachers' teaching experience did not have any significant impact on their attitudes towards computer-based devices in the classroom. In particular, it did not have any substantial influence on the instructors' attitudes to computers, computer confidence, computer usefulness, and computer liking. However, my study findings on this aspect contradicts that of Alaugab (2007), which found that teaching experience was negatively associated with towards perception towards e-learning. In other words, with the increase in teaching experience,

the teachers tended to have a more positive attitude towards e-learning. Once again, this may be due to technological advances made during the ensuing seven years, which has hastened acceptance of computer-based learning.

There was no significant difference between the genders in my study. This outcome is not congruent with some previous studies. In both Alturise's (2017) and Xu's (2007) studies, male teachers showed more positive attitudes towards ICT tools than females. Unlike male teachers, their female counterparts felt that the use of computer-based devices was more complicated than the conventional method of teaching. Due to the differential role of gender on the attitudes of teachers towards ICT tools, the Saudi government has responded by investing more resources to training processes. The government has also invested heavily in the education sector by availing the necessary resources to ensure that teachers are comfortable in using technology tools in teaching (Almalki & Williams, 2012). It is apparent from the present study that the issue of teacher attitudes towards computer usage in Saudi Arabia is not influenced by gender. This finding could be explained by the strong policies of the Saudi government, which emphasize gender equality in education and the adoption of ICT across both female and male schools. This position is captured by Al Mofarreh (2016), who comments on the importance of Saudi Arabia's policy in normalising ICT use in schools for both male and female teachers and their students. It appears that these strategies have been successful.

5.3 Limitations

This study was limited to teachers in secondary schools in Taif, Saudi Arabia. While large, the sample was not randomly selected and, therefore, generalisations from the study should be accepted with caution. The study also may have limitations because it relied more on female teachers than males in the sample. This lack of balance in gender could have resulted from the

questionnaire being distributed more to girls' schools than boys' schools, or as a result of more female than male teachers choosing to participate. In Saudi Arabia, only female teachers are allowed to teach in exclusively girls' schools. Therefore, this could be the possible reason for having more female teachers in the sample.

Self-report was another of the limitations affecting the credibility of the study. For instance, it could have led to exaggerations and social desirability bias in responses from the participants. The study was also hampered by the fact that it only obtained data online. The questionnaire was administered online, and the answers were provided through the same medium. Therefore, future surveys need to be conducted through pen and paper to avoid the effect that can be caused by a prior knowledge or an inclination towards computers, since people familiar with computers were probably more likely to participate in this study than those who were not so au fait with computer use.

By focusing on teachers only, the study may have failed to account for the role of students in influencing teachers' attitudes towards e-learning. Therefore, future studies should focus on integrating students into the survey to understand whether they play any role in the instructors' perceptions towards incorporating ICT in teaching.

Lastly, the present research was primarily quantitative. Therefore, it would be important for future studies to employ a mixed-method approach by integrating both qualitative and quantitative data to better understand the experiences of teachers concerning the use of computer devices in teaching in Saudi Arabia.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Computer-based devices have become important educational tools in Saudi Arabia's secondary education institutions. However, the value of these technologies depends on how effectively teachers may use them to support their teaching. To better understand the practice of using computer-based devices in schools, this study examined secondary teachers' attitudes toward using computers. The study found that teachers showed relatively positive attitudes toward the use of computers, indicating that they recognised their significance within the classroom context. This outcome delineates the great effort the Saudi government has put into ensuring that ICT tools are integral components in the provision of education.

Over the past decade, the Saudi government has been advocating the extensive adoption of computer-based learning in the country's educational institutions and has applied these policies on an equal basis in girls and boys schools within the education system. Notably, the government adopted the computer-based policy with the objective of making Saudi Arabia competitive and among the elite countries in the world in terms of academic standards. Consequently, this policy has ensured that there is no significant difference in the way both male and female teachers perceive computer usage in schools. As revealed by the findings, both male and female participants believed that the adoption of technology tools in the education sector is critical in assisting them in teaching students, and as well in preparing them to face the current global socio-economic environment. Further, the study showed that the adoption of computer-based tools could help teachers address some of the most frequent challenges affecting students.

While the general attitude reported by participants was positive, the findings revealed that there were still some barriers to successful integration of computer-based tools in schools. These

included the issues of work pressure on teachers and the high number of students in classrooms. In terms of work pressure, the study demonstrated that some teachers believed that the use of ICT tools added an additional burden to their teaching workload. The high number of students that instructors are expected to teach using limited ICT tools further compounds the problem.

Though the study shows a generalised positive attitude among teachers towards computer-based devices, demographic features seemed to have limited influence. The findings revealed that age does not play a role in the ultimate outlook towards ICT tools in terms of use. However, inconsistent with some prior studies, the present study did not show any significant association between the teachers' teaching experience and age and their attitudes towards computer-based devices in classrooms. In addition, it was evident that gender did not have an influence on the general attitude of teachers towards ICT tools.

6.2 Recommendations

Based on the findings of the study, the researcher presents a number of recommendations to help further boost Saudi teachers' attitudes towards computer-based devices in teaching:

1) There is a need to increase technical support to help Saudi teachers use the available ICT tools with minimal challenges. The introduction of any technological tools, such as computer-based devices, presents a host of challenges that may make the work of teachers difficult. Unable to solve these challenges, teachers may develop negative attitudes towards their usage in offering educational instruction. Therefore, it is highly recommended that the government establish a technology support service unit within schools throughout Saudi Arabia to help teachers in the usage of computer-based devices

in teaching. An effective support program should offer teachers the required ICT skills and show them effective ways of using them for teaching students (Almoaiqel, 2016).

2) Further, school management across the country should focus on developing infrastructure and providing adequate ICT devices as well as software to match the growing number of students. As highlighted by the findings, most of the teachers identified the lack of enough computer devices and software as one of the challenges they face. For this reason, it would be important to make computers and associated devices and software easily available to all teachers (Alothman et al., 2017; Alzamil, 2003).

APPENDICES

Appendix A: Ministry of Education Permission Request

Ministry of Education - Department of Education

Saudi Arabia

Taif City Division

taifedugov@gmail.com

(+699) 0127321754

Dear Dr. Mohamed Amer Alnofaie,

This letter is to introduce Mrs Shatha Alharthi, a student enrolled in the Master of Education course in the School of Education at Flinders University, South Australia. As part of this degree, Shatha is undertaking a research project exploring the attitudes of teachers to use computer-based devices. I am writing to seek your assistance with this study. The major contribution of this study is to suggest how computer-based devices use can be increased and made more effective in Saudi Arabia's schools. The study, when completed, will advance current understanding in the area of information communication technologies and education in Saudi Arabia. This study will focus on teachers. In the research, teachers will be asked to complete an online questionnaire about technology integration in secondary schools. We seek your permission to conduct this research at all secondary schools under your division. The research will use a quantitative approach where secondary teachers will be invited to participate in a 10-15 minute anonymous questionnaire.

The questionnaire will contain questions about their views on computer technology skills as well as their experience with computer technologies and processes

of integration. The questionnaire will be sent to the teachers through school principals. After the completion of this research, all respondent information will be removed and destroyed. In addition, you will receive a letter with the findings and suggestions to share with your staff by the end 2018, which might contribute to enhancing teaching and learning. Staff and schools will not be identified in the research, and questionnaires will be anonymous. Any enquiries you may have concerning this research should be directed to me, Shatha's supervisor, Dr. Grace Skrzypiec at grace.skrzypiec@flinders.edu.au or (+61) 8 82015878, or Shatha at alha0349@flinders.edu.au or (+61) 0401401182.

Do you approve this study at your schools?

If so, you will need to sign an approval letter which will be provided for you to forward to the Flinders University Ethics Committee.

I hope that you will give this request due consideration.

Shatha Alharthi

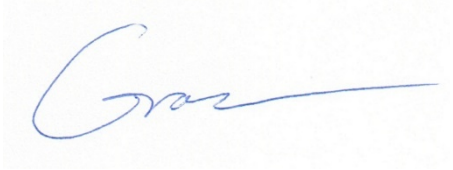
Master Student, School of Education

Flinders University

(+61) 401401182

Email: alha0349@flinders.edu.au

Seacombe Gardens, South Australia 5047



Dr Grace Skrzypiec

School of Education, Flinders University, GPO Box 2100, Adelaide 5001, South Australia

Appendix B: Ministry of Education Approval (Arabic)

المملكة العربية السعودية
وزارة التعليم
الإدارة العامة للتعليم بمحافظة الطائف
إدارة التخطيط والمعلومات
البحوث والدراسات

وزارة التعليم
Ministry of Education

الرقم: 193
التاريخ: 1439/07/01
المشفوعات:

الموضوع: تسهيل مهمة الباحث: شذى احمد عوض الحارثي
في تطبيق دراسة علمية (ماجستير)

المكرم قائد مدرسة المدرسة الثانوية بالطائف
المكرمة قائدة مدرسة المدرسة الثانوية بالطائف

وفقكم الله

اسم الباحث	شذى احمد عوض الحارثي			
الجامعة	جامعة فلندرز			
الكلية	التربية	التخصص	القياس والتقويم التربوي	
الغرض من الدراسة	ماجستير			
عنوان الدراسة	اتجاهات المعلمين نحو استخدام تكنولوجيا المعلومات والاتصالات			
أدوات الدراسة	استبانة	عينة الدراسة	معلمين معلمات	

السلام عليكم ورحمة الله وبركاته,,, وبعد:

فبناءً على ما تقدّم به الباحث الموضح اسمه أعلاه لتطبيق الأداة الخاصة بدراسته, ونظراً لاكتمال إجراءات الدراسة نأمل منكم تسهيل مهمته في التطبيق على العينة المشار إليها .

شاكرين لكم ومقدرين تعاونكم ,,,

المدير العام للتعليم بمحافظة الطائف

أ. محمد بن عامر النفيعي

الطائف - هاتف : 0127321754 - فاكس : 0127329316 - Web site : researches.taifedu.gov.sa

Appendix C: Ministry of Education Approval (English)

Ministry of Education

Kingdom of Saudi Arabia **No. : 193**

Date:18/03/2018

Ministry of Education

Attachments: General Directorate of Education in Taif

Department of Planning and Information Research and Studies

Subject: Facilitating the task of the researcher: Shatha Ahmed Awad Al-Harthi to apply a scientific study (Master's Degree).

Researcher's name: Shatha Ahmed Awad Al-Harthi

University: Flinders University

School: Education

Field of Specialization: Educational measurement and evaluation

The purpose of the study: Master's degree

Title of the study: Secondary teacher attitudes towards computer-based devices.

Study's instruments: Survey

Study's sample: Male and female teachers

Dear Sir/Madam,

Upon request of the researcher, whose name described above, on the application of her study instrument, and owing to the completion of the study procedures, we hope that you will facilitate the task of the researcher to apply her study instrument on the aforementioned sample. Thank you very much for your kind cooperation!

Director General of Education, Taif Governorate

Mr. Muhammed Bin Amer Al-Nefaie

Website: researches.taifedu.gov.sa Taif / Phone: 0127321754 Fax: 0127329316

Appendix D: Participation Information Sheet

(Page 1)

Grace Skrzypiec

School of Education

College of Education, Psychology & Social Work

GPO Box 2100

Adelaide SA 5001

Tel: +61 08 8201 5878

INFORMATION SHEET – INVITATION TO PARTICIPATE IN RESEARCH

Title: Secondary teacher attitudes towards computer-based devices in the classroom environment in Saudi Arabia

Researcher:

Mrs Shatha Alharthi

School of Education Master of Education (Educational Research, Evaluation and Assessment)

Flinders University

Supervisor:

Dr Grace Skrzypiec

School of Education

Flinders University

grace.skrzypiec@flinders.edu.au

Ph: +61882015878

School of Education

(Page 2)

Description of the study:

This questionnaire-based study is part of the project entitled 'An exploratory study of secondary teacher attitudes toward the computer-based devices in the classroom environment in Saudi Arabia'

The study will explore the attitudes of teachers to using computer-based devices in the classroom environment of a sample of secondary teachers based in Saudi Arabia. The research will ascertain the extent to which those participating in the research study perceive themselves to have positive attitude of the use of the computer-based devices to support teaching and learning. Also, this study will examine how secondary teachers' attitudes toward computer-based devices differ according to their personal and demographic factors. The major contribution of this study is to suggest how computer-based devices use can be increased and made more effective in Saudi Arabia's schools. This project is supported by the School of Education at Flinders University.

Purpose of the study:

This project aims

- To examine the attitude of a sample of secondary teachers based in Saudi Arabia toward computer-based devices in the classroom environment;
- To examine how secondary teachers' attitudes differ according to the personal and demographic characteristics, such as years of teaching experience, gender and age;
- To seek the views of the teachers concerning the effectiveness of computer technology courses for teachers.

(Page 3)

What will I be asked to do?

You are invited to complete an online survey. The survey will ask you about your experience and opinion of integration computer-based devices in classroom environment. The survey will take participants about 10-15 minutes to fill in a respond to questions. The completed survey will be electronically saved through Survey Monkey platform. Please note that 29 August /11:59 PM is the date/time limit on submitting questionnaire responses. We will appreciate your agreeing to help in conducting this study on time limit.

What benefit will I gain from being involved in this study?

The research is expected to be beneficial to education in the Kingdom of Saudi Arabia, as little is known about the attitude of teachers towards the use of computer-based devices in this context. The sharing of your experience will enhance the integration of computer-based devices in Saudi Arabia secondary schools. The results of the study will help all parties in computer-based devices adopting to assess their computer-based devices attitude by using the suggested recommendation.

Will I be identifiable by being involved in this study?

Participation is voluntary and the identities of teachers who agree to participate will remain confidential**.** No teachers are required to complete the questionnaire. Responses will be anonymous. Teachers will not be asked to write their names on this questionnaire.

(Page 4)

Are there any risks or discomforts if I am involved?

There are no risks or discomforts when you are involved in this research. If you have any concerns regarding anticipated or actual risks or discomforts, please raise them by contacting Shatha's supervisor, Dr Grace Skrzypiec. Her contact details are included at the top of this information sheet.

How do I agree to participate?

Filling in the questionnaire and returning it to the researcher is considered approval of participation. Again, participation is voluntary and we will appreciate your agreeing to help in conducting this study.

How will I receive feedback?

After the completion of this research, a summary of the results of the research will be published on the Ministry of Education in Taif City Division official website, https://edu.moe.gov.sa/Taif, and will be available there for all participants to access.

Thank you for taking the time to read this information sheet. We hope that you will accept our invitation to be involved.

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number '7983. here following approval'). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.

Appendix E: Survey of Teacher Attitude towards Computer Technologies (English)

Part I: Computer Attitude Scale

Below are a series of statements. There are no correct answers to these statements. They are designed to permit you to indicate the extent to which you agree or disagree with the ideas expressed. Please place a CHECKMARK in the space under the label which is closest to your agreement or disagreement with the statements.

Attitude toward Computer	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Computers do not scare me at all.					
2. I'm no good with computers					
3. I like to work with computers.					
4. I will use computers many ways in my life.					
5. Working with computers makes me very nervous.					
6. Generally, I feel OK about trying a new problem on the computer					
7. The challenge of solving problems with computers does not appeal to me.					
8. Learning about computers is a waste of time					
9. I do not feel threatened when others talk about computers.					
10. I don't think I would do advanced computer work					
11. I think working with computers would be enjoyable and stimulating.					
12. Learning about computers is worthwhile					
13. I feel aggressive and hostile toward computers					
14. I am sure I work with computers.					
15. Figuring out computer problems does not appeal to me.					
16. I' II need a firm mastery of computers					

Attitude toward Computer	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
17. It wouldn't bother me at all to take computer courses.					
18. I'm not the type to do well with computers.					
19. When I have a problem with a computer that I can't immediately solve, I stick with it until I have the answer					
20. I expect to have little use for computers in my daily life					
21. Computers make me feel uncomfortable					
22. I am sure I could learn a computer language.					
23. I don't understand how some people can spend so much working with computers and seem to enjoy it.					
24. I would feel at ease in a computer class.					
25. I think using a computer would be very hard to me.					
26. Once I start to work with computer, I find it hard to stop.					
27. Knowing how to work with computers will increase my job possibilities.					
28. I get a sinking feeling when I think of trying to use a computer					
29. I could get good grades in computer courses.					
30. I will do as little work with computers as possible					
31. Anything that a computer can be used for, I can do just as well some other way.					
32. I would feel comfortable working with a computer					
33. I do not think I could handle computer courses.					
34. If a problem is left unsolved in a computer class, I would continue to think about it afterward.					
35. It is important to me to do well in computer classes.					
36. Computers make me feel uneasy and confused.					
37. I have a lot of self-confidence when it comes to working with computers.					

Attitude toward Computer	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
38. I do not enjoy talking with others about computers.					
39. Working with computers will not be important to me in my life's work					

Part II: Additional comments (please answer fully):

A. What additional information do you have might be relevant to describing your experience using computer-based devices in your classroom?

Part III: Demographic Information:

For each of the following questions, please CHECK the item that best applies to you:

1. **Age**:
   - 20 – 29
   - 30 – 39
   - 40 – 49
   - 50 – 59
   - 60 or more

2. Gender
- Male
- Female

3. Number of years in teaching experience at the collegiate level:
- First year
- 5 years or less
- 6 - 10 years
- 11 – 15 years
- 16 – 20 years
- More than 20 years

4. Number of years of experience with computer technology:
- Less than 1 year

- 1 – 3
- 4 – 5
- 6 – 10
- Over 10 years. Please specify…..

5. Highest academic degree obtained

- Ph.D.
- Masters
- Bachelors
- Others. Please specify…..

6. For the following statements, please indicate your use of the service: (Please tick one box only for each option).

	Never	Rarely	Occasionally	Frequently	Very Frequently
How often do you use computer at home?					
How often do you use computer at office?					
How often do you use Internet at home?					
How often do you use Internet at office?					

7. What is your skill level of using computer technologies?

- Very proficient
- Proficient
- Beginning

8. What is your English language level?

- Excellent

- Very good
- Good
- Weak

Thank you very much for your participation in our study.

Appendix F: Survey of Teacher Attitude towards Computer Technologies (Arabic)

استبانة لقياس اتجاهات المعلمين نحو تقنيات الحاسب الالي

الجزء الأول: مقياس الاتجاه نحو الحاسب الآلي

في ما يلي مجموعة من العبارات فضلا ضع إشارة (√) على الاختيار المناسب لكل عبارة بكل دقة وصراحة علما أنه لا توجد عبارات صحيحة وأخرى خاطئة

اتجاهات المعلمين نحو الحاسب الالي	اوافق بشدة	اوافق	موافق الى حد ما	غير موافق	لا أوافق بشدة
1- الحاسب الالي لا يخيفني على الاطلاق					
2- لا أحسن استخدام الحاسب الالي					
3- أرغب باستخدام الحاسب الالي					
4- سوف استخدم الحاسب الالي في جوانب عديدة في حياتي العلمية					
5- العمل باستخدام الحاسب الالي يشعرني بالتوتر					
6- بشكل عام، ارتاح لمحاولة حل مشاكل جديدة باستخدام الحاسب الالي					

7- التحدي لحل بعض المسائل بالحاسب الالي لايناسبني					
8- التعلم عن الحاسب الالي يضيّع وقتي					
9- لا أشعر بالانزعاج عندما يتحدث الأخرين عن الحاسب الالي					
10- لا أعتقد أني ارغب في أستخدام مهارات الحاسب الالي المتقدمة					
11- أعتقد أن العمل باستخدام الحاسب الالي ممتعًا ومشجعا.					
12- التعلم عن الحاسب الالي أمر يستحق العناء					
13- اشعر بعدائية نحو الحاسب الالي					
14- بكل تأكيد أستطيع أن أقوم بعملي باستخدام الحاسب الالي					
15- حل مشاكل الحاسب الالي لا يروق لي					
16- سيتعين عليّ اتقان التعامل مع الحاسب الالي من أجل حياتي المستقبلية					
17- لا يزعجني على الاطلاق ان					

ادرس مواد الحاسب الالي					
18- لست من النوع الذي يحسن استخدام الحاسب الالي					
19- عندما أواجه مشكلة ما في الحاسب الآلي ولا أتمكن من حلها؛ فإنني أبذل جهدي حتى أتوصل لحل لها					
20- استخدامي للحاسوب محدود في حياتي اليومية					
21- يشعرني الحاسب الالي بعدم الارتياح					
22- أنا واثق من قدرتي على تعلم لغة الحاسب الالي					
23- لا افهم كيف يمكن لبعض الناس انجاز الكثير من الأعمال على الحاسب الالي دون أن يشعروا بالملل					
24- أشعر بالراحة في مادة الحاسب الالي					
25- أعتقد أن استخدام الحاسب الالي صعب عليّ للغاية					
26- لا استطيع ترك الحاسب الالي بمجرد الشروع في العمل عليه					
27- معرفة كيفية التعامل مع الحاسب الالي					

سيعزز من فرص علمي					
28- اشعر بالإحباط وعدم الطمأنينة عندما افكر في محاولة استخدام الحاسب الالي					
29- أستطيع تحصيل علامات مرتفعة في مواد الحاسب الالي					
30- أقوم بأعمال قليلة قدر الامكان على الحاسب الالي					
31- أي يشيء يمكن ان يستخدم به الحاسب الالي أستطيع أن أقوم به بأي طريقة					
32- أشعر بالراحة بالعمل مع الحاسب الالي					
33- لا أعتقد أنني أستطيع دراسة مادة الحاسب الالي					
34- اذا لم تحل مشكلة في مادة الحاسب الالي فإني استمر بالتفكير بها					
35- من المهم بالنسبة لي تحقيق نتائج جيدة في مادة الحاسب الالي					
36- الحاسب الالي يشعرني بالقلق وتشويش الذهن					
37- لدي الكثير من الثقة بالنفس عندما يتعلق الأمر بالعمل					

على الحاسب الالي					
38- لا استمتع بالحديث مع الآخرين حول الحاسب الالي					
39- العمل على الحاسب الالي لن يكون مهما لي في حياتي العملية					

هل لديك معلومات إضافية، قد يكون لها صلة بخبراتك السابقة عن استخدام تقنيات الحاسب الالي في الفصل؟

1- العمر

- 20 – 29
- 30 – 39
- 40 – 49
- 50- 59
- 60 أو أكثر

2- الجنس

- ذكر
- أنثى

3- عدد سنوات الخبرة كمعلم/ معلمة في المدرسة

- سنة واحدة
- 5 سنوات أو أكثر
- 6 – 10 سنوات
- 11 – 15 سنة
- 16 – 20 سنة
- أكثر من 20 سنة

4- عدد سنوات الخبرة في إستخدام تقنية الحاسب الآلي

- أقل من سنة
- 1 – 3 سنوات
- 4 – 5 سنوات
- 6 – 10 سنوات
- أكثر من 10 سنوات. يرجى التحديد....

5 – المؤهل العلمي

- درجة الدكتوراه
- درجة الماجيستير
- درجة البكالوريوس
- غير ذلك. يرجى التحديد.....

6 ـ الرجاء تحديد نوعية ومدى الاستخدام (الرجاء اختيار إجابة واحدة لكل فقرة).

	كثير من الأحيان	لا أستخدمه أبداً	نادراً	أحياناً	بصورة متكررة
ما مدى إستخدامك للحاسوب في المنزل؟					
ما مدى إستخدامك للحاسوب في المكتب؟					
ما مدى إستخدامك للإنترنت في المنزل؟					
ما مدى إستخدامك للإنترنت في المكتب؟					

7-ما مستوى مهارتك في استخدام تكنولوجيا الحاسب الالي؟

- مبتديء
- بارع
- بارع للغاية

8- ما مستواك في اللغة الإنجليزية؟

- ممتاز
- جيد جدًا
- جيد
- ضعيف
- لا يوجد

انتهت الإستبانة وشكرا ***

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