

# **An investigation of Saudi Arabian EFL teachers' engagement with technology**

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## Glossary Of Terms

EFL	English as a Foreign Language
ESL	English as a Second Language
TVTC	Technical and Vocational Training Corporation
TK	Technology Knowledge
PK	Pedagogical Knowledge
CK	Content Knowledge
TPK	Technological Pedagogical Knowledge
TCK	Technological Content Knowledge
PCK	Pedagogical Content Knowledge
TPACK	Framework of Technological Pedagogical Content Knowledge
TOEFL	Test of English as a Foreign Language
CALL	Computer-Assisted Language Learning
ICT	Information Communication Technology
SD	Standard Deviation

## Abstract

Technology has become a central component of many progressive and developmental trends in education. Accordingly, the task of increasing the effectiveness of the learning processes can be performed precisely through the help of various technological methods. Modern education cannot be safely separated from technology without losing some possible advantages. For this reason, there is a strong need to research and estimate the perception of technology use within educational processes and how technology can support learning.

As an outcome of recent educational reforms in Saudi Arabia, technology has become imperative element to support learning. It was previously thought in Saudi Arabia that technology was not crucial to learning; however, modern education that does not make use of digital technology is at a decided disadvantage. Moreover, engagement with technology is now an important factor in the teaching and learning process. This research investigated English as a Foreign Language (EFL) teachers' use of technology to support learning, willingness to use technology to support learning and their perceptions of Technological Pedagogical Content Knowledge (TPACK) and its usefulness in their teaching.

After a small pilot study helped shape the methodology to be used, a mixed method approach was adopted using a larger pool of participants. This methodology combined elements of quantitative and qualitative

research approaches such as online survey and interviews. Explanatory sequential design, based on quantitative and qualitative data, conducted to find out teachers perceptions, factors and relationships related to technology implementation.

Despite willingness to use technology tools that promote the learning process, the actual level of technology use in the classroom can be quite varied. The participating EFL teachers, who generally lacked sufficient skills and experience in technology, had a reduced use of technology in learning processes. However, EFL teachers working in technical colleges in Saudi Arabia were willing to use technology to support learning, as they were more proficiently skilled. They demonstrated extensive willingness to implement technology in the EFL classroom.

This study found that EFL teachers' use of technology is positively associated with their perceptions of willingness to use that technology and with the perceptions of TPACK they employ as a way of understanding its pedagogical use. The study also found that the technology supported effective strategies for learning EFL. Despite the validation that the TPACK framework was not supported by factor analysis, the perception of TPACK of EFL teachers in Saudi Arabia was enough to develop a relevant understanding of the fundamental role of technology in the teaching process. Moreover, EFL teachers with extensive experience in practising English language in a Western society had a significantly higher perception of TPACK than teachers lacking such experience. There was an inconsistent

relationship between EFL teachers' TPK, TCK and PCK and their perception of TPACK framework. However, EFL teachers usually considered their perception of TPACK sufficient to conduct different teaching experiments in the EFL classroom.

# CHAPTER ONE

## Introduction

### 1.1 BACKGROUND

English has become the world's preferred language of commerce, science and education. As learning in a comprehensive setting becomes a standard, either on the Internet or in real classrooms, English language learning is more important than ever (Tariq & Michelle, 2010). Technology's role in language learning has been an issue since the 1960s, and as technology evolves, we will see more opportunities for technology to assist language learning. Levy (1997) refers to learning with technology more succinctly as the search for and study of applications of the technology in language teaching and learning. Learning technology is not only procedural but also shows some transformation of an individual's experience into the individual's knowledge through the knowledge construction process (Moore, Dickson-Deane & Galyen, 2011).

While traditional classroom learning (with its face-to-face contact and social interaction) remains important, technology can co-exist with and supplement traditional ways of teaching. Al-Shehri (2011) believed that technology could enhance or even replace aspects of the traditional ways of learning in the near future.



## **1.2 TEACHING EXPERIENCE**

The researcher has been working for Saudi Arabia's Technical and Vocational Training Corporation (TVTC) since 2002. The TVTC governs 34 technical colleges and many vocational institutes. Working as an English as a Foreign Language (EFL) teacher in this educational environment enabled the researcher to know and learn all aspects related to the learning process. The focus of technology use in education was essential. The researcher, working in an EFL environment, developed a clear perspective towards use of technology.

Teachers' experiences in using technology in EFL classrooms have been positive. When new technology is embraced and engaged, it can be a very effective tool within the learning environment. In the past decade, research has shown that some members of the teaching profession find new technology daunting. They refuse to fully engage with it and therefore fail to get the best results from it (Angeli & Valanides, 2013). Benson and Ward (2013) argued that such teachers are less comfortable with technologies that level the playing field between themselves and their students; learning together with the students in the use of technology is uncomfortable for these teachers.

Having experienced a downturn in use and popularity, technology in the classroom has enjoyed a renaissance in recent years, with teachers rediscovering its educational promise (Herring, 2004). For these reasons, the researcher came to the belief that the willingness of teachers to engage with

technology and their actual use of technology are important aspects of teaching, especially in teaching EFL

The process of integrating technology into the EFL classroom is dependent on the interrelations between technology, pedagogy and content. These aspects are crucial to understanding EFL teachers' willingness to use technology in the classroom. In general, contemporary teachers strive to be competent and proficient in their field, which means that they make persistent efforts to improve their pedagogical approach (Debevec, Shih & Kashyap, 2006). Implementing technology in the EFL classroom is an important means of developing education in Saudi Arabia.

The availability of technology in the modern EFL classroom environment in Saudi Arabia can provide new opportunities for both students and teachers. The effective implementation of various technological tools in education can facilitate teachers' creativity and involve students in the process of learning EFL (Kozma, 2003). From this perspective, an exploration of EFL teachers' use of technology in the classroom, their willingness to implement technology and their perception of Technological Pedagogical Content Knowledge (TPACK) provide a better understanding of technology's emergence as a tool of empowerment and creativity (Debevec, et al., 2006).

In terms of classroom challenges, EFL teachers in Saudi Arabia usually encounter difficulties related to time management, personal accountability

and previous educational experiences of learning (Kozma, 2003). EFL teachers need to be prepared to deal with similar challenges in a professional manner so that they can fulfil their educational objectives and enhance student learning.

EFL teachers in Saudi Arabian technical colleges rely on the TPACK paradigm to guide their instruction (Marino, Sameshima & Beecher, 2009). These teachers develop an effective and reliable teaching strategies that motivate students to learn and retain the knowledge (Debevec, et al., 2006). Emphasizing complex relationships in the field of education is required in order to ensure a relevant understanding of the technical preparation of EFL teachers. The researcher explored the professional experiences of Saudi Arabian EFL teachers by collecting their perceptions of TPACK via online survey and interview. Teachers working environment is considered, as some teachers have enhanced access to technology, whereas other teachers have limited access to technological applications (Kozma, 2003).

This study has been conducted based on previous studies such as Benson and Ward (2013) and Marino, et al. (2009), which show the importance of technology integration and the urgent need for more integration of technology in the EFL classroom. This thesis therefore studies Saudi Arabian EFL teachers' use of technology to support learning, willingness to use technology to support learning, their TPACK perceptions and the factors that determine these perceptions.

### **1.3 STUDY CONTEXT**

The education system in Saudi Arabia is characterised by a commitment to religion in every aspect of the education process (Liton, 2012). Three agencies are responsible for the implementation of the Saudi Arabian Education System: the Ministry of Education, the Ministry of Higher Education and the Technical and Vocational Training Corporation (TVTC). Through these agencies, the government of Saudi Arabia provides free education that is compulsory until the ninth grade (the final stage of elementary school, when most students turn 15 years old). Segregation by gender, in accordance with religious beliefs, is mandatory.

The TVTC was established in 1980 in recognition of the need to provide training in specific technical disciplines (Al-Jarf, 2008). The TVTC has two branches. The first branch is composed of technical colleges that are responsible for commercial, industrial and agricultural technical training. The second branch is composed of institutions that are responsible for vocational training in areas such as welding, baking, tailoring and car mechanics.

### **1.4 TECHNICAL COLLEGES IN SAUDI ARABIA**

The Saudi Arabian government views technical and vocational training as important for economic development. Training aims to build a pool of skilled labourers in order to decrease the country's reliance on foreign workers and increase the country's local employment rate (Prokop,

2003). Saudi Arabia's first technical college opened in 1980, and by early 2013 the TVTC governed 35 technical colleges throughout the country. Only male teachers and students are accepted in TVTC courses, which are two-year programs that award diploma certificates upon completion.

## **1.5 TEACHING ENGLISH IN TECHNICAL COLLEGES**

The national technical college curriculum requires that English be taught as a foreign language; English is important, as it is the primary language used in the sciences, commerce and international affairs (Spring, 2008). TVTC students study this compulsory subject for six hours a week. Few EFL Egyptian teachers are offered long-term contracts. No native English-speaking teachers are currently employed in TVTC institutions (TVTC, 2013). The absence of native English-speaking teachers negatively affects outcomes and prevents EFL teachers from one of their main language acquisition sources.

English was introduced as the language of instruction early in the establishment of Saudi Arabia's technical colleges. This innovation contributed to the success of the colleges in the following years in the form of higher employment rates among graduates. However, after the government mandated that Arabic be the medium of instruction from 1995 (under religious and social pressure), the ability of graduates to find and keep jobs declined sharply, since English was used as a common language in many industries (Quillen, 2012). Recognising this, beginning in 2006 the TVTC sent

hundreds of EFL teachers abroad to complete Master's degree programs (TVTC, 2013). These teachers returned to work at technical colleges and the results of graduates subsequently improved (Liton, 2012).

TVTC's policy is to provide EFL teachers with the latest technologies to maximise the effectiveness of the teaching process. Computer laboratories and data projectors were the most popular technology used. However, an acute shortage in the provision of technical support and training remains a major obstacle to the use of such devices.

## **1.6 SIGNIFICANCE OF THE STUDY**

This study is important because it focuses on certain educational aspects that must be investigated, especially in Saudi Arabia and other less developed countries. The shortage of similar studies in the education field in Saudi Arabia brings this study to the forefront. This study fulfils the need to investigate EFL teachers' perception of technology use to support learning, willingness to use technology and teachers' level of TPACK.

This study also reveals important implications for practice. The educational sector in Saudi Arabia is dynamic and in constant development, which means that EFL teachers can continuously improve their technological knowledge and skills in order to improve student academic performance (Khan, 2011). Accordingly, the present study can provide valuable recommendations for enhancing EFL teachers' implementation of technology in the classroom.

The importance of the TPACK framework worldwide is recognised in this research in an attempt to focus on professional development opportunities for EFL teachers in the Saudi Arabian classroom. Teachers can differentiate certain boundaries of the precise knowledge areas pertaining to the TPACK framework (Debevec, et al., 2006). Knowledge of technology enables EFL teachers to make creative use of their teaching abilities. Factors of technology knowledge, content knowledge and pedagogy knowledge play a significant role in determining EFL teachers' perceived use of technology and willingness to use technology in the teaching process.

The aim of the study is to explore the association between EFL teachers' use of technology to support learning, their willingness to use technology to support learning and their perception of TPACK. Furthermore, the aim of the study is to identify any obstacles in the use of technology to support learning.

## **1.7 RESEARCH QUESTIONS**

It is anticipated that the introduction of EFL teachers to TPACK will help to explain the apparent disparity between usage of technology and their willingness to use technology to support learning. Accordingly, the research questions are framed around the research needs for the three research components.

Research questions were categorised upon the three research components – use of technology to support learning, willingness to use

technology and TPACK. The literature review explains the ordering of the research questions.

#### **1.7.1 Use of technology to support learning**

RQ 1: What is the perception of EFL teachers on the use of technology in teaching in Saudi Arabia?

RQ 2: What is the relationship between EFL teachers' perception of the use of technology in teaching and their perception of TPACK?

RQ 3: What factors affect the extent to which EFL teachers use technology in teaching in Saudi Arabia?

#### **1.7.2 Willingness of use technology to support learning**

RQ4: How willing are EFL teachers to use technology to support learning in Saudi Arabia?

RQ5: What is the relationship between EFL teachers' perception of willingness to use technology in teaching and their perception of TPACK?

RQ6: What factors affect EFL teachers' willingness to use technology in teaching?

#### **1.7.3 TPACK**

RQ 7: What is the perception of TPACK among EFL teachers in Saudi Arabia?

RQ 8: How do EFL teachers' perception of TPK, TCK and PCK relate to their perception of TPACK?



RQ 9: What factors affect the perception of EFL teachers' TPACK?

## **1.8 THESIS STRUCTURE**

### **1.8.1 Chapter One: Introduction**

This chapter gives background about learning EFL, the context of the study (technical colleges in Saudi Arabia), the significance of the research and the structure of the thesis.

### **1.8.2 Chapter Two: Literature Review**

The literature review summarises the current state of knowledge about EFL teaching in Saudi Arabia, and explores the literature on the use of technology in teaching and teachers' willingness to use technology to support learning. The chapter then describes TPACK and the related terms and components used throughout the research and the thesis. Factors previously determined to affect EFL teachers' perception of engagement with technology are presented. The literature review leads into the formation of the research questions.

### **1.8.3 Chapter Three: Methodology**

This chapter outlines the backgrounds of EFL teachers who participated in the research, data collection instruments and the research method. Chapter three then explores, constructs and explains the development of the research instruments.

#### **1.8.4 Chapter Four: Pilot Study**

A small sample of EFL teachers working in Saudi Arabia was investigated to refine methods of assessing their willingness to use technology in the classroom.

#### **1.8.5 Chapter Five: Results**

The chapter presents and analyses the results of the mixed method study.

#### **1.8.6 Chapter Six: Discussion**

In chapter six, the results of analysis of the survey data are discussed with reference to the research questions. Interview results are discussed in detail. Participant's perceptions are considered. The factors that affect EFL teachers' use of technology, willingness to use technology and TPACK are presented and the research questions addressed.

#### **1.8.7 Chapter Seven: Implication, Limitation and Conclusion**

This chapter describes the possible limitations of the study. The chapter also considers recommendations and implication for further research. The chapter finishes with a conclusion for the research and closes the thesis.

## CHAPTER TWO

### Literature Review

The literature review examines the current state of the pedagogical use of technology in the classroom, particularly in Saudi Arabia. It discusses how EFL is taught in Saudi Arabia, the methods associated with learning English, as well as a prototype of technology that can be used to improve EFL teaching and learning. The seven components of Technological Pedagogical Content Knowledge (TPACK) are described in detail in order to measure EFL teachers' perceptions of TPACK. The five stages that EFL teachers typically pass through in TPACK are presented. The results of previous research on teachers' willingness to use technology to support student learning is discussed, and the learning components that most affect teachers in the classroom are determined.

Language teachers worldwide are increasingly seeking to improve their work and learn how to use information available through technology. The most important goals of the pedagogical use of technology are bidirectional learning and individual learning (Benton & Beatrice, 2013). Computer software can make traditional teacher-based methods more student-centred, can improve instruction and can make learning the English language easier and more effective.

## **2.1 ENGLISH AS A FOREIGN LANGUAGE IN SAUDI ARABIA**

English is the only foreign language taught to students in Saudi Arabia (Al-Shammary, 2009), largely due to its economic prominence.

### **2.1.1 Learning a foreign language**

One can learn a foreign language in various ways, but the best way is generally considered to be classroom tuition with a teacher and a peer group with whom to learn and practice, study grammar rules, memorise vocabulary and translate sentences (Jack & Theodore, 2001). Many people also learn languages by connecting with teachers over the Internet using media like Skype, MS Messenger and Moodle. It is possible to find good teachers from reputable language schools in this way, but this teaching style is best for language students at intermediate level or above who want to refine their vocabulary, conversation skills and aural comprehension (Liton, 2012). Many online language schools focus upon the conversation element but often neglect the important aspects of grammar and writing skills. There are also companies that offer books and audiovisual courses for learning languages, but these are best used in support of more formal language teaching methods.

### **2.1.2 The importance of English**

English is the international language of business and science (Bektas, 2012). Global use of the language began with the expansion of the British Empire and accelerated with the rise of the United States to a world power

after World War II. Citizens of other former British possessions, notably India, are already well versed in English. Recently English has become Europe's second language, with two-thirds of European people able to speak it (Waterfield, 2010).

### **2.1.3 EFL or ESL**

English as a Foreign Language (EFL) and English as a Second Language (ESL) are often used interchangeably but have different meanings. EFL refers to the teaching or learning of English as a foreign language in a society where another language is dominant, whereas ESL refers to teaching or learning English as a second language side-by-side with another language. A teacher of English to speakers of other languages in a non-English-speaking country is teaching EFL: for example, an Australian teacher who teaches English in Saudi Arabia is an EFL teacher (Mirici, 2008). By contrast, an Australian teacher teaches ESL to people living in Australia whose first language is not English.

### **2.1.4 Investment in the English language**

As already noted, English is the language of the global economy and as such is a requirement for doing business in many countries. An international preference exists for dealing in English. In India, it pays to speak English because it "increases the hourly wages of men by 34% and of women by 22%" (Prakash, Azam & Chin, 2010, p. 2). The Saudi Arabian government have promoted learning of the English language since the early

1930s, when King Abdualaziz signed an agreement for oil exploration with the Standard Oil Company of California. Saudi authorities started sending young Saudis to the United States from that time to learn English, as they realised the importance of English in the oil industry at that time.

### **2.1.5 Methods of teaching English**

According to Sasaki (2011), the best method of learning any national language is exposure to the country and understanding of the language and culture of the people. This exposure, combined with formal classroom teaching, is a much faster method than learning from books, audio-visual courses or the Internet. All EFL teachers work in countries in which the English language is not common. Therefore, spending time in an English-speaking country like the UK, Canada, the USA or Australia will greatly assist the overall learning experience. Nevertheless, teachers know that each teacher and student needs to determine their own way of learning (Cajkler & Hall, 2009).

### **2.1.6 Change of teaching methods in the technology presence**

Various studies have focused on the benefits that technology can bring to pedagogy. Ismail, Rahman, Hassan and Mahmud (2008) discussed how a web-based learning system that used mobile technology increased undergraduate students' appreciation of the practical applications of their lessons, as well as several pieces of software suitable for students in a particular field. Similarly, Liaw and Marty (2001) made use of technology to

help university students' experience communication and interactivity during consulting episodes in a medical degree program. The environment produced with the use of technology enabled students to experience consulting from a different perspective that allowed them to gain a greater appreciation of clinical and medical record software and how such innovations could help them in their practice.

Other researchers have focused specifically on language learning. Yubune, Kanda and Tabuchi (2007) determined the effects of different computer display methods on the reading competence of undergraduate learners. Sercu and Peters (2002) investigated language teachers' views on the effectiveness of using multimedia technology in their classrooms. However, these studies described what Harris, Mishra and Koehler (2009) termed as the "technocentric" integration of computers into teaching. According to Harris et al. (2009), many attempts at combining technology with pedagogy have resulted in simply using a new device in whatever way seemed appropriate in a classroom setting, to the extent that in some cases the pedagogy was being modified and shaped around a new technological innovation.

Modifying pedagogy to suit technology is not sensitive to the underlying relationship between technology, content and pedagogy, which, as Harris et al. (2009) proposed, should be examined in context before any attempt at integrating technology into instructional practices is made. This proposition is supported by other researchers, such as Zapanta (2004), who

described research into the use of Computer Assisted Language Learning (CALL) in ESL learning as a multidisciplinary effort that required the integration of the expertise of curriculum designers, technical experts and classroom teachers. The objective of integrating technology in instruction should not merely be to find out how a new technology can increase current practice, but should also explore how to authentically combine technology, content and pedagogy such that they become critically indivisible parts of a given lesson. To date, no study (to the researcher's knowledge) has investigated the merging of technology with EFL content teaching.

Regarding altering students' understandings about merging academic content with technology in teaching and learning, Edwards, Higley, Zeruth and Murphy (2007) discussed how many undergraduate pre-service teachers perceive themselves as being incapable of making changes to traditional practices in education. While pre-service teachers were found to be confident in imparting learning content to their students, they were found to be much less confident in challenging current modes of delivery with what they perceived to be more effective modes. These findings underscore the position of Harris et al. (2009) that teachers must be allowed to make changes so that the effective transformation of traditional practices to authentically technologically-enriched practices can occur. According to Edwards et al. (2007), pre-service teachers are aware of weaknesses in practice but nevertheless feel that, despite their knowledge of modern technology and



their familiarity with technology innovations such as the Internet, they are not in a position to implement the necessary changes.

Undergraduate pre-service teachers are not confident enough to suggest or make changes to their current teaching practices because they have insufficient knowledge to integrate technology, even when proficient in its use, into their instructional practice (Wei, Crawford & Niederhauser, 2013). That is, despite their knowledge of various technologies, the ability to actually integrate these technologies into a classroom setting seems a task that is too specialised for them to undertake. These teachers do not realize that they are in the best position to integrate technology into their instructional practices (Harris, et al., 2009). This paradox suggests that more research needs to be done to determine what knowledge EFL teachers must have to integrate technology into their teaching and how they might develop this knowledge.

#### **2.1.7 Teaching English as a Foreign Language in Saudi Arabia**

Although Saudi Arabia has adopted EFL teaching in all academic disciplines (Tariq & Michelle, 2010) , religious and social pressure still influences such teaching in national schools (Tabitha, 2002; Tariq & Michelle, 2010). On the one hand, King Abdullah has implemented reforms such as the re-qualification of educators, curriculum development and a heavy emphasis on technology to make sure that schools are supplied with technological equipment and skilled teachers. On the other hand, religious and social conservatives have called for the “Saudization” of all university education

and the elimination of English instruction altogether (in favour of Arabic). These opponents of English-language instruction justify their proposals by reference to linguistic, cultural and religious considerations, and to the fact that many students remain illiterate in English despite consistent expenditure (Al-Shammary, 2009). Poorly qualified EFL teachers aggravate the problem: their pedagogical training, sometimes involving only four weeks of study for a teaching certificate, is inadequate (Al-Hazmi, 2003).

The Saudi school system consists of two types of schools: government-run schools and private schools owned and run by private Saudi individuals under Ministry of Education (MoE) supervision. Although private schools use the same curriculum as public schools, instruction in EFL differs (Abdan, 1991). In 2003, due to international pressure caused by the September 11<sup>th</sup> attacks on the United States, English began to be taught in the elementary public school system (Al-Shammary, 2009). Until then only the private schools taught English from the first grade (seven years old), whilst in the public schools, the teaching of English was introduced at age 12 (Abdan, 1991). Nonetheless, in both private and public schools, from primary school on, students receive only four 45-minute EFL lessons per week.

Although elementary-level private schools are free to select their own textbooks, intermediate-level private schools are compelled to use the same textbooks as those used by public schools. Produced by the Ministry of Education, these texts are oriented according to a strict system of Islamic values and history (Al-Hajailan, 1999; Zaid, 1993).

English language is a compulsory subject in each specialisation at Saudi Arabia's universities, including Islamic studies (Tariq & Michelle, 2010). A recent shortage of domestic EFL teachers has forced the Ministry of Education and Ministry of Higher Education to employ EFL teachers from other Arab countries and Western nations.

### **2.1.8 Methods of teaching English as a foreign language in Saudi Arabia**

In Saudi Arabia, English language teachers focus on conveying the subject by memorisation – rote learning of grammar and vocabulary – rather than by understanding its nuances and perceiving it within a cultural context. As in the Islamic education method, in most subjects, English is taught from a textbook-based perspective rather than teacher-based classroom interaction (Prokop, 2003). Classes typically have 25–35 male or female students who are mostly monolingual, and the lessons themselves are generally conducted by Islamic-nurtured individuals who are not always fluent in English themselves, or who refrain from delivering the lesson in English due to little comprehension of the language on their students' part (Al-Jarf, 2009).

The teacher is seen as the authority. He or she gives the lesson; the students absorb the subject with uncritical acceptance and respect, and only at the end can they ask their questions. Furthermore, the entire lesson is dedicated to transmitting Islamic values and history. The Ministry of Education states that it wants to produce “young, educated, proud Muslims who are patriotic and proud of their Islamic history” (Tariq & Michelle, 2010,

p. 3). These goals influence teachers to pay more attention to the religious belief rather than choosing the most effective teaching method. In short, even though there is progress in EFL teaching in Saudi Arabia – and numerous interventions have been experimented with in order to encourage motivation (Moskovsky & Alrabai, 2009) – EFL is still taught with the focus on memorization rather than on critical understanding or actual use of the language.

Poorly qualified teachers occasionally teach English and structure it around Islamic teachings and Arab identity. In contrast, EFL teacher graduates from all Saudi Arabian universities follow a four-year program in English-language skills, linguistics, literature, translation and applied linguistics. Unfortunately, one methodology course for EFL graduates is inadequate; in fact, it has been taught in Arabic for some time. This course is not responsive to the needs of would-be EFL teachers (Al-Hazmi, 2003).

Recently the Ministry of Education and the Technical Colleges have been collaborating with the embassy of the United States of America and the British Council to provide Saudi English teachers with modern teaching methods through short courses in most Saudi Arabian provinces (Liton, 2012). This collaboration is a positive development because it allows for the transfer of professional expertise to EFL teachers from a trusted source.

Technical colleges offer at least three compulsory English courses in each major that are organised according to three proficiency levels: general

English, English specialist 1 and English specialist 2. All Technical Colleges employ the same majors and textbooks. However, methods of English language instruction vary. Whilst some use traditional ways of delivering instruction such as grammar translation and audio-lingual approaches, others focus more on the communicative and social aspects of the language or use an integrative approach (Banegas, 2011).

### **2.1.9 Pedagogical use of technology in teaching in Saudi Arabia**

The Ministry of Education trained selected teachers in Computer Studies and introduced the subject into secondary schools in 1996 (Liton, 2012). Students used computers to produce their assignments and reports. The Ministry of Education equipped all high schools with computers for use in management, course preparation and other school activities. By contrast, a government project to equip primary schools with computers and laboratories was discontinued due to a shortage of teachers and trained staff (Alshumaimeri, 2008).

In research on the extent to which Saudi teachers used the Internet to support their classes, Al-Asmari (2005) found that teachers rarely (on average about 13% of the time) used it for teaching, due to limited levels of expertise with and limited access to computers and the Internet. To address this problem, in 2008 King Abdullah instituted a reform project called “Tatweer” that required that teachers and educators receive training in technology use; that schools be equipped with data projectors and smart boards and communication networks; and that servers and databanks of e-learning

courses be constructed. However, despite these reforms, Barnawi (2009) observed that most classrooms remained teacher-dominated.

Barnawi (2009) finding aligns with other research that demonstrates the importance for teachers who use computers to show an interest in and liking for the computers, as well as knowing how to use computers well. The teacher is a crucial part of the educational setting. If the teacher does not know how to employ computers, or discredits them as Western or unnecessary, the lesson and teaching itself could be affected negatively (Alshumaimeri, 2008).

Research has shown that Saudi Arabian students make good use of technology in their studies. When assessing the degree to which graduate students used online resources to assist them in their studies, Al-Saleh (2004) found that the majority of students used library electronic resources for academic information needs. These students (61%) used resources for class assignments, more than half (58%) used them for their theses, and most also employed them for personal purposes. There was also a positive correlation between the student's knowledge of English and utilisation of electronic resources. Finally, Al-Saleh (2004) found that more students would have been interested in employing electronic resources but were impeded due to insufficient instruction, insufficient computing resources and difficulty in accessing the Internet and library electronic sources.

More recently, Al-Meini (2008) indicated that, while Saudi teachers were transmitting learning via textbooks inside the classroom and some still resisted using technology because they viewed it as “forbidden” or unnecessary, students were becoming bored with traditional ways of teaching. This is increasingly driving change. Teachers are actively seeking government funding to install computer equipment in their classrooms or even doing so at their own expense. Therefore, according to Al-Meini (2008), Saudi Arabia is gradually moving towards incorporating technology in its instructional format.

#### **2.1.10 Pedagogical use of technology in teaching EFL in Saudi Arabia**

King Abdullah implemented reforms in 2008 that insisted on broader training for teachers in computers and modern technology, and called for schools to equip themselves with cutting-edge technology. Nonetheless, little overall progress seems to have made. As noted earlier, Barnawi (2009) recently showed the earlier problems still remain. Despite the fact that some teachers are interested in using the Internet for instructional purposes, insufficient training, limited access to relevant technology and the imposition of traditional methods of instructional delivery all act as barriers to using the Internet in the classroom (Barnawi, 2009). Moreover, the Ministry of Education and (often) principals and teachers persist in perceiving the traditional mode of teaching – textbook-based, teacher-centred pedagogy – as being sufficient for conveying all subjects, including EFL.

Technical colleges are equipped with the latest computer hardware and software in laboratories that are accessible to both teachers and students. However, Al-Asmari (2005) found that teachers were doubtful about the benefit of using the Internet for EFL learning, and both students and teachers had little training in its use. All EFL teachers expressed their willingness and interest in integrating technology for instructional use in the future, but these individuals still reported using a teacher-centred approach (Al-Asmari, 2005).

Studies have shown that there is a positive correlation between Saudi teachers' attitudes to using computer-assisted language learning (CALL) in the classroom and the English-language achievements of their students (Alshumaimeri, 2008; Banegas, 2011). The teachers may know how to use the technology, but if they hold negative attitudes to its use, students pick up that attitude, which can impact their learning of the language.

Another issue is that most popular software programs or even web-based technology are not designed for educational purposes (Harris, et al., 2009; Koehler & Mishra, 2009). Software programs such as Microsoft Office applications are mostly designed for use in a work setting rather than for teaching/learning. Teachers consequently need to develop skills that allow them to use these technologies for teaching EFL in the classroom. Gaining knowledge of how to engage and motivate students in effective learning is a crucial issue for EFL teachers.



To summarise, even though Saudi universities, technical colleges and schools might be equipped with modern-day technology, and despite recent reforms to implement training, the literature suggests that teachers of EFL in Saudi Arabia remain inexperienced in the use of technology and some are reluctant to depart from traditional pedagogical methods.

## **2.2 USE OF TECHNOLOGY TO SUPPORT LEARNING**

### **2.2.1 Use of technology in learning**

The technology used in learning can be defined as “any software program that is designed to teach a specific topic through user interaction” (Weller, 2013, p. 135). The teacher is acknowledged as being the most important factor in learning, no matter what the teaching style (from didactic authoritarian to the child-centred facilitator); the teacher is the one who leads and guides learning in order for students to achieve their maximum potential. Thus, it is essential to determine what the teacher wants and needs to receive from the use of technology in the learning process. In many cases, the teacher needs the technology to increase his/her productivity. Information and communications technologies can deliver subjects to students in highly accessible ways, thereby placing all students on equal footing. Students might accomplish the same degree of success as other students by using the right hardware, software and curriculum activities (Freedman, 2005).

Technology gives students access to data from sources that were previously difficult or impossible because of time constraints, costs or both;

technology-enhanced language learning can motivate the students to produce better and more in-depth work, and to become efficient and independent. According to Waycott, Bennett, Kennedy, Dalgarno and Gray (2010) technology enables the teacher to actively spend time in support of individual students' learning while others are engaged in individual learning activities. Technology also provides teachers with a flexible tool for their teaching, allowing them to be enthusiastic about their subject and produce lessons that will inspire and interest their students. Therefore technology can be used to support more traditional teaching practices (Manarino-Lettett & Cotton, 1985). An additional bonus for teaching staff is that homework and assignments can be posted on an institution's website, where they are freely accessible to all students and parents, along with all the necessary information to help students to complete their work. Clearly, technology has the capacity to provide many benefits in the language classroom environment. The use of technology in non-English-speaking countries will be examined next.

### **2.2.2 Use of technology in teaching EFL in non-English speaking countries**

Technology has been shown to be an effective component of English teaching in several non-English speaking countries. For example, Kilickaya (2007) conducted a mixed-methods study on the use of technology to improve Turkish students' Test of English as a Foreign Language (TOEFL) scores. The study found that the experimental group that used technology

scored significantly higher than the control group in the reading and listening sections of the TOEFL exam. Interviews with the members of the experimental group revealed that the students generally had very strong, positive opinions about the value of technology, and believed that the use of technology had greatly improved their performance on the TOEFL exam. While Kilickaya (2007) focused on adult students, Lan, Sung and Chang (2009) studied younger EFL students in Asia who used a technology-enhanced system for reading in English. After analysing their participants' reading proficiencies before and after the implementation of the system, Lan, Sung and Chang (2009) found that the system helped EFL students to organise their learning while completing individual reading tasks and pursuing group goals. A similar study conducted by Neri, Mich, Gerosa and Giuliani (2008) found that a technology-supported learning environment produced English pronunciation learning outcomes that were not significantly different from those produced by traditional teaching. However, Neri et al. (2008) highlighted in their research that the system was so simple that it could be run by facilitators who were not English language experts themselves. Such findings are highly valuable, as they help solve a variety of staffing problems that exist in English language learning systems in less developed countries. Hui (2008) examined the progress of technology in education systems across the world and found an increasing trend of effectiveness in its applications in both English and non-English-speaking countries.

Various devices have been used in creating technology systems for EFL students to generate stronger learning outcomes (Lu, 2008). The success of technology in EFL learning is evident from studies conducted in Malaysia (Hew, 2001), the Netherlands (Cucchiarini, 2008), the United Arab Emirates (Hanson-Smith, 2000) and Saudi Arabia (AbuSeileek, 2007; Alshumaimeri, 2008).

The attitudes of teachers to technology are critical to its effective implementation in the classroom. The next section discusses technology from the perspective of teachers.

### **2.2.3 Use of technology - teachers' perspective**

Teachers' views on technology vary in different studies conducted across several countries. A general study conducted by Albirini (2006) on the attitudes of teachers toward ICT revealed that were both apprehensive and enthusiastic about its use. Psaroudaki and McKay (2008) claimed that teachers were attracted by the expected increased teaching effectiveness of computer-assisted teaching and learning systems. However, another study found that teachers felt they would have a difficult time learning how to operate the software and hardware involved in technology-enhanced instruction (Otto & Pusack, 2009). On the other hand, pre-service teachers sampled by Abbitt (2007) saw their initial lack of familiarity with contemporary teaching-related technology as a challenge rather than a hindrance.

Some teachers believe that using technology to facilitate learning is an unnecessary expense. This belief was reflected by Alshumaimeri (2008), who focused specifically on determining the perceptions and attitudes of Saudi Arabian secondary EFL teachers in using technology in English-language classrooms. As with the other studies, EFL teachers sampled in Alshumaimeri's study had both positive and negative attitudes towards the use of technology. The negative attitudes of teachers focused primarily on a lack of confidence with respect to using technology for the learning process. Another matter brought up by teachers sampled by Alshumaimeri (2008) was the lack of institutional support for professional development to equip them with pedagogical skills related to facilitating technology.

Milbrath and Mable (2000) showed that the provision of continued support in the workplace was a significant factor for improving teachers' perceptions of technology. Milbrath et al. (2000) also noted that the extent of prior knowledge about technology affected teachers' attitudes towards its use. Prior knowledge of technology was supported by a study conducted by Fernandez (2005), which focused on the effect of familiarisation with technology in improving teachers' perceptions. Lambert, Gong and Cuper (2008) stated that course teaching, as well as previous technology experience, had an important impact on teachers' ability to know the worth of integrating technology in the classroom. Perhaps drawing from the inferences of Fernandez (2005) and Milbrath, et al. (2000), Lambert et al. (2008) proposed the implementation of a single technology course for pre-service

teachers aimed at improving their knowledge through strong systems of technology transfer.

#### **2.2.4 Use of technology in the classroom**

There are varied responses in the literature to the idea of using technology in the classroom. Nicholl, Flutter, Hosking and Clarkson (2013) indicated that there was evidence of a link between good technology provision and high standards across all subjects, but that the former's contribution towards better attainment was variable at best. Andrews (2004) suggested that as long as the teaching materials (including technology) are appropriate to the needs and language ability of the students, then technological materials are as useful for teaching EFL as they are for teaching English to 'mother tongue' students. He went on to suggest that the presence of teachers is as important as the presence of technology, especially when the teacher acts a mediator to control the information. This argument addresses one of the major concerns that educators have with regard to the increasing use of technology in the classroom – the idea that the teacher's role will eventually become less important or limited to maintenance support

The effect that technology can have in the classroom can be positive, as long as teaching activities are designed to provide information that enables the student to strive towards a goal; that builds upon existing knowledge or experience; that encourages the student to demonstrate his or her knowledge through performance; and that allows for constructive feedback. According to Laurillard (1991), the feedback phase been the

weakness in many technology-assisted learning packages, as they are too reliant upon prior knowledge. However, provided that the teacher selects the software carefully, the activities are appropriate to the students' level and the context of the lesson and there is correct guidance towards set learning objectives, the student can make good use of technologies in the classroom irrespective of the curriculum area (Wegerif & Dawes, 2004).

Wegerif and Dawes (2004, p. 130) goes so far as to state that technology can be a great motivator for students, and that "ICT helps teachers and students to create interesting classroom environments where interactivity and opportunities to communicate enable all to participate". Weller (2013) developed an idea about the importance of knowledge sharing technologies – that they: "allow students to experiment, they make learning more active and enjoyable, and they demonstrate certain concepts easily that are difficult to express in print or speech" (p. 59).

In today's multi-literate world, it is vital that students are encouraged to engage with, and communicate through, the range of media at their disposal. In the increasingly complex cultural world, it is important that all people are able to access and use multimodal literacy, which is necessary to be able to compete in the modern technological work environment (Walsh, 2009) . This multi-literate world gives access to a whole new shared learning experience: "it's about the nature and future of learning, new teachers and new teaching, formal and informal learning settings, and hopes of

developing more dynamic and engaging learning environments or learning in communities of practice or action” (Al-Othman, 2005, p. 43).

The literature reviewed above shows that technology is an important part of the modern language classroom. Despite educational reforms in many countries, including Saudi Arabia, evidence suggests that teachers are not making enough use of technology in the teaching and learning process.

## **2.3 WILLINGNESS TO USE TECHNOLOGY TO SUPPORT STUDENT LEARNING**

According to Cassidy (1992), ‘willingness’ can be defined as the quality or state of being willing, free choice or consent of the will, freedom from reluctance, or readiness of the mind to do or forbear. Evidence from the literature suggests that a teacher’s willingness to use computers to support students’ learning has five components, described below.

### **2.3.1 Educators’ attitude towards using technology in the classroom**

Research has shown that people may have a positive attitude towards using technology for private purposes but are unwilling to use it for work (Jawahar & Elango, 2001): “A positive attitude towards computers also affects how computer self-efficacy develops” (Khorrami-Arani, 2001, p. 18), so it is important to determine whether teachers possess a positive attitude towards technology use in the classroom setting (Allan & Ma, 2001). A positive attitude is a strong manifestation of willingness to use technology to support student learning.



### **2.3.2 Anxiety towards technology use in the classroom**

Anxiety plays a major role in determining the willingness of teachers to use computers in the classroom. Unwillingness to try out a new teaching strategy may stem from fear of being unable to cope with the new technology in the learning environment (McNierney, 2004). Since technology use is a relatively new feature in language instruction pedagogy, it can be assumed that some teachers are apprehensive regarding training in technology use and subsequent application of strategies and innovations in their classrooms. Yaghi and Abu-Saba (2007) provided an international perspective on anxiety about technology use in classrooms. Among the most prevalent factors were teacher insecurity and fear of not having the necessary technical competence to integrate the necessary technology seamlessly into a classroom environment.

Another concern of teachers regarding the use of technology in the classroom (as identified by Yaghi and Abu-Saba, 2007) was the effectiveness of such applications, given that they would have to spend considerable time and effort learning how to apply such technology in their classrooms. Many teachers expressed doubt as to whether or not the use of technology in the classroom would actually result in better learning outcomes, and some contended that technology use in classroom may even slow down classroom discussions because of the time required to set up equipment. Other teachers were anxious that using technology in the classroom would generally shift the class' focus to the technology rather than to the lesson (Yaghi & Abu-Saba,

2007). More than a decade later, Kessler (2010) gathered opinions from pre-service teachers and showed that the same anxieties remain. Most of the pre-service teachers in the study did not have sufficient background in technology use, so they initially perceived its application negatively, thinking that it was a threat to the teacher and to learning in the classroom in ways similar to those Yaghi and Abu-Saba (2007) enumerated. The pre-service teachers expressed anxiety about whether or not they would be able to transfer their teaching strategies and styles into a technological environment, and were affected by previous negative experiences with poorly designed educational technology.

### **2.3.3 Self-efficacy towards technology use in the classroom**

Self-efficacy is defined as the reflective perception of a teacher that he or she is capable of undertaking a specific task (Kuo, 2008). According to Compeau and Higgins (1995), computer self-efficacy has a major impact on an individual's expectations towards using computers. Consequently, teachers who do not regard themselves as capable with new technology will be less likely to use or want computers in their classrooms.

Kuo (2008) investigated self-efficacy among student teachers regarding internet-assisted language learning and teaching, one of the sub-areas of technology use. In particular, the study examined Taiwanese EFL student teachers' self-efficacy toward integrating internet-assisted language learning resources and activities into their future English teaching. The study of 101 student teachers found that over 70% felt they were responsible for the

application of internet technology in their respective EFL classes, and that “they would like to use internet-based materials and activities in their future EFL classroom as much as possible” (Kuo, 2008, p. 7). However at the same time, over 70% of the student teachers took the position that they lacked the competence and were generally under-prepared – if not completely unprepared – to integrate internet-based materials into their teaching strategies (Kuo, 2008). Almost 90% of the respondents felt that they should be exposed to more technology training opportunities that could hone their skills not only in internet literacy, but in the application of the Internet as an essential resource in their classes (Kuo, 2008). Kuo’s study gives valuable insight into self-efficacy, indicating that it does not necessarily depend on how much an educator actually wants to apply technology in his or her teaching. Many teachers may wish to apply technology in their teaching, but due to their low self-efficacy, they believe that they have insufficient technology skills to do so.

#### **2.3.4 Motivation towards technology use in the classroom**

Motivation helps to reduce tension, stress and frustration and is central to effective teaching. A motivated teacher is eager to participate in and contribute to the education process, and thus shows an openness to new ideas and technologies (Ofoegbu, 2004). This attitude is important in the adoption of new technologies.

The motivation for teachers to pursue the application of technology-enhanced teaching strategies can be explained in the context of several

theories developed in the academic literature. Okan (2007) made use of the critical theory of educational technology to explain teachers' motivations for using technology in the classroom. This theory is based on the premise that current society is technologically empowered, and that the information superhighway already plays a significant role in various aspects of the lives of teachers (Okan, 2007); thus, there is a natural desire to apply learning about technology in teaching to make daily routines more convenient and efficient while enhancing the learning experiences of students. Ward and Parr (2010) lent support to this theory through their investigation of what motivates teachers to make use of technology in areas of learning that have not previously made use of computer technology. Ward and Parr (2010) found that more teachers are becoming motivated by the practicality that the integration of technology offers to their respective classrooms. Furthermore, teachers were encouraged by the ideal of transforming the classroom from the traditional teacher-centred structure to the student-centred, constructivist structure, where they believed more genuine learning occurred (Ward & Parr, 2010). On the other hand, Sorebo, Halvari, Gulli and Kristiansen (2009) made use of the self-determination theory to explain teachers' motivations for the use of technology in their respective classrooms. This theory holds that teachers are influenced by "perceived autonomy, perceived competence and perceived relatedness" (Sorebo et al., p. 1177). Perceived autonomy refers to the preservation of teachers' academic freedom. Teachers who believe that their teaching and assessment style and strategies would be undermined by

the application of technology in their classroom settings feel less motivated to learn about technology-assisted instruction than teachers who believe that technology applications can enhance their teaching strategies rather than limit their academic freedom (Psaroudaki & McKay, 2008).

Perceived competence is similar to the Kuo study (2008) mentioned in the previous subsection, in that teachers who feel that they have greater self-efficacy to implement technology-driven teaching strategies are motivated more extensively than teachers who feel that their current competency towards technology-assisted instruction is insufficient. However, as discussed by Kuo (2008), the inverse of this statement is not necessarily true. That is, there are teachers who are enthusiastic about making use of technology in their classrooms even if they feel that they have insufficient technological background.

### **2.3.5 Goal-setting in relation to technology use**

Goal-setting leads to higher achievements; the more difficult the goals, the better the results. Teachers who set goals for themselves are more willing to learn new programs and software packages (Jawahar & Elango, 2001).

Ebsworth, Kim and Klein (2010) provided thorough insights on the direction of technology goals in both the short and long term. In the short term, the purpose of technology development is concentrated on enabling the teacher to integrate personal expectations with the necessary technology skills and materials that they need in order to facilitate effective technology

use in their classrooms (Ebsworth, et al., 2010). Another objective in the short term is to build a critical mass of teacher and school administrator support for the integration of technology in their institutions that would drive the necessary reforms needed to realise long-term goals (Ebsworth, et al., 2010). In the long term, Ebsworth, et al. (2010) envision that teachers will fully integrate technology in their teaching practices, and thereby reap the maximum benefits of technological innovations. In this vision, classrooms are perceived as running entirely on a constructivist curriculum, where teachers facilitate student learning through various technological advantages that enable them to guide students sufficiently towards the achievement of consistently authentic learning outcomes.

## **2.4 TECHNOLOGICAL KNOWLEDGE, PEDAGOGICAL KNOWLEDGE AND CONTENT KNOWLEDGE (TPACK)**

The TPACK framework focuses on three components: technology, pedagogy and content. In this framework, technological and pedagogical content are merged together to produce technological pedagogical content of a student. This section of the literature review engages with the concept of TPACK – technological, pedagogical and content knowledge, its evolution and current state.

### **2.4.1 History of TPACK**

It is difficult to track the development of TPACK, as it is not a new idea in the education field. TPACK has undergone three main transformation stages to arrive at the version of the TPACK framework we have today. The

first stage was Shulman's (1986) idea of pedagogical content knowledge. Shulman was the first researcher to use knowledge as a concept related to the amalgam pedagogy and content, but he did not refer to technology as knowledge, nor did he use acronyms supporting this idea. It became necessary to integrate technology into the educational process since technology by itself cannot effect change. The second stage in the development of TPACK occurred when Pierson (1999) added the element of technology to Shulman's (1986) notion of pedagogical content knowledge, calling this 'PCK'. Lastly, Misha and Koehler (2006) developed a conceptualisation framework based on Shulman's (1986) idea (see section 2.6.2). However, they concentrated on teachers integrating technology into their pedagogy in any subject matter. TPACK is used today to refer to the knowledge that teachers need in order to use technology effectively in teaching content to students.

#### **2.4.2 Essential concepts**

to the principal study in the TPACK literature is Koehler and Misha (2009), who present an extensive discussion on various aspects of TPACK. The acronym itself is composed of four elements, with knowledge as the unifying element. Knowledge in the context of TPACK is defined as the competence of the teacher in a particular area (Koehler & Mishra, 2009). Peels (2010) defined knowledge as how to do and perform certain tasks. Technology refers to devices that may not have been specifically constructed to be used in pedagogy, but can be integrated into a teacher's pedagogy to

make the delivery of content more effective. Pedagogy is defined as the use of instructional strategies to facilitate learning. Lastly, content refers to the actual material that the teacher wishes students to learn (Koehler & Mishra, 2009).

### **2.4.3 Difference between TPACK and TPCK**

The difference between TPACK and TPCK is not clear from the literature. Koehler and Mishra (2009) stated that TPACK was formerly known as TPCK, and that the addition of the vowel in TPACK was added in later versions of the framework to simplify pronunciation (“tee-pack” as opposed to “tee-pee-cee-kay”). The earliest use of the term TPCK was found in the study of Pierson (1999) . Although the study itself did not change the term, it cited other studies that could no longer be located by this researcher. According to Pierson (1999) the term TPCK refers to the fact that content knowledge can be linked to both technological and pedagogical knowledge. It refers to the interaction of technological devices with the content, such as the use of calculators in lessons on mathematics, while pedagogical content referred to the interaction of pedagogy with lesson content, such as helping students gain mastery over mathematical computations through drills. Thus, TPCK sought to combine technological and pedagogical elements in teaching content knowledge.

Hughes (2000) was the first researcher to use TPCK with reference to teaching the English language. Hughes’ usage is slightly different from the more modern usage of Koehler and Mishra (2009), as well as from the usage



of other recent studies such as Archambault and Oh-Young (2009) and Brupbacher and Wilson (2009). Nevertheless, both of these studies used TPCK as a term equivalent to TPACK.

TPACK, as it is used today, refers to content as equally important to pedagogy and technology, rather than connected with knowledge as was the case in its earlier conceptualisations. The re-conceptualisation could imply that TPACK contains three types of knowledge: technological knowledge, pedagogical knowledge, and content knowledge. Each of these types of knowledge can be combined with another to create a new type of knowledge (second-level knowledge) that is different from the two types that created it. Consequently, combining the three types of knowledge generates the complex concept of TPACK itself. These different combinations are discussed in the following sections.

#### **2.4.4 Complexities of the seven components of TPACK**

As previously discussed, TPACK involves three types of knowledge; these individual types, the three pairs that can be formed from the three types, plus the combination of all three types, representing new concepts (second-level knowledge). These concepts are the seven components of TPACK, which are defined as follows.

#### **2.4.5 Technology knowledge (TK)**

This concept refers to knowledge of technological devices and innovations, such as mobile technology, the Internet, blogs, wikis and

electronic whiteboards (Koehler & Mishra, 2009). Cox and Graham (2009) define technology knowledge as knowledge of how to use emerging technology. It is obvious that knowledge about technology and how to use it in the classroom is very important for teachers.

#### **2.4.6 Pedagogical knowledge (PK)**

This concept refers to the knowledge of teaching or competence to teach in general (Koehler & Mishra, 2009). Cox and Graham (2009) referred to pedagogical knowledge as the way that teachers can simplify teaching activity in the classroom. All activities that take place in the classroom can be considered as pedagogical knowledge.

#### **2.4.7 Content knowledge (CK)**

This concept refers to knowledge of the subject matter. In the context of this study, CK refers to knowledge of and about the English language (Koehler & Mishra, 2009). Cox and Graham (2009) contend that content knowledge is knowledge about how to simplify the subject area. Thus, introducing and representing subject matter is the core of content knowledge.

#### **2.4.8 Technological pedagogical knowledge (TPK)**

Koehler and Mishra (2009, p. 65), defined TPK as the “understanding of how teaching and learning can change when particular technologies are used in particular ways.” When a piece of technology is introduced, without reference to a specific content, a teacher can allow students to determine whether the given technology is appropriate to his or her teaching strategy. If

the technology is deemed applicable, then the following question emerges: how can that technology be applied in order to serve some objective in the teaching and learning process? According to Koehler and Mishra (2009), building TPK requires the development of “a deeper understanding of the constraints and affordances of technologies and the disciplinary contexts within which they function is needed” (p. 65).

TPK is the most important pairing of knowledge types in TPACK, since the software programs that may be useful for specific educational contexts are often not built specifically for use in educational settings. This pairing of knowledge means that a teacher may have technological tools right under his or her nose, but it takes good TPK for him or her to be able to recognise such tools and put them to proper use. For example, Second Life is online software that began for all intents and purposes as a virtual world game. Yet, a group of educators’ TPK led them to recognise the educational potential of Second Life, particularly as a tool for enhancing distance learning environments (Kirriemuir, 2010).

No studies have investigated TPK development in the context of learning EFL. This gap in the literature review leads to an essential question, that is: how effective is the TPK in Saudi Arabian EFL teachers’ teaching?

#### **2.4.9 Technological content knowledge (TCK)**

This concept refers to knowledge of technological devices and developments that are relevant to the content itself (Koehler & Mishra, 2009).

While Koehler and Mishra (2009) gave examples of TCK including x-rays in the field of medicine and carbon dating in the field of anthropology, examples relevant to EFL learning are the electronic dictionary, wikis, blogs and online translators. The degree to which the teacher knows how to incorporate all of these innovations related to the subject is the teacher's TCK.

#### **2.4.10 Pedagogical content knowledge (PCK)**

This concept refers to the knowledge of strategies or activities that teachers can use to simplify the subject matter. In the context of this study, PCK refers to the knowledge of teaching EFL. PCK includes knowledge of the working curriculum and its sequence of topics, as well as traditional strategies that are used in facilitating EFL instruction, such as lectures, drills and role playing.

#### **2.4.11 Technological pedagogical content knowledge (TPACK)**

Combining the three types of knowledge produces the concept of TPACK, which is basically TPK applied to a particular content that in this case is EFL learning. Brupbacher and Wilson (2009) stated that innovative teachers use technology devices as part of their pedagogy in helping students learn the target content. A gap appears here between the contexts in which the framework could be used and how supportive the Saudi Arabian English teachers are of the use of this knowledge framework.

#### **2.4.12 Application of TPACK**

Some recent studies focused on first level of knowledge of TPACK, while others focused on some of the TPACK components. It was essential to find studies that focused on all the components of TPACK.

Schmidt et al. (2009) developed their TPACK survey items by sending their forty four initial items to nationally recognised researchers in the United States to test if the knowledge domains were accurate. This procedure aggregated the opinion of many experts. It was a valuable contribution to insights into how teachers perceive TPACK.

Teachers' perceptions and preparation were important to investigate the knowledge of TPACK. Archambault and Oh-Young (2009) studied the perceptions of 596 teachers about the three central TPACK components (technology, pedagogy and content). The survey was designed to examine teachers' perception of their knowledge and their preparation for the knowledge test. They used an item inventory previously employed by Kohler and Mishra (2005) and Shulman (1986). The Archambault and Oh-Young (2009) study is valuable for current research because it helps to analyse how teachers prepare for the TPACK.

Assessing student performance can reveal essential aspects of teachers' TPACK knowledge. Madyarov (2009) investigated CK and TK knowledge in 43 students – a small but valuable study, because very few studies have examined students' performance. Madyarov examined EFL at a Middle

Eastern university, and thus applied TPACK to the learning experience for students.

Jimoyiannis (2010) evaluated the implementation and design of Technological Pedagogical Science Knowledge (TPASK) by Greek science teachers, using all TPACK components. Jimoyiannis' work is one of few studies of TPASK and is thus useful to the current study as a new model for teachers' professional development on an integrated TPACK model and the authentic learning approach. Jimoyiannis (2010) draw on the need to expand TPACK framework by including a fourth dimension, the Educational Context within Pedagogy, Content and Technology equally interact, in order to address future policy models concerning teacher preparation to incorporate technology in education.

Arslan and Sahin-Kizil (2010) examined the use of TK and CK by 23 EFL teachers in Turkey. Their conclusion was that technocentric methods have alienated the other elements of the TPACK that were not so technologically focused. This researcher is thus attempting to rectify this in the current study, analysing social methods as well as technological skills.

Jamieson-Proctor et al. (2010) studied pre-service teachers in Australia to determine their understanding and confidence about using TK in teaching. It is thus an excellent model for how to examine the practical use of TPACK knowledge items. At the same time, Kalogiannakis (2010) explored TK in relation to teachers' readiness, finding that that technology, as well as other

factors, can cause changes in learning. Kalogiannakis actually tries to put TK as a variable in a dependent-independent relationship. Kalogiannakis used survey items that analysed TK and readiness together.

On the other hand, Rohaan et al. (2009) surveyed primary school teachers in The Netherlands about their PCK and TK. They used a multiple choice test as its survey item, but its test was drawn from 1991 and 1996, relatively old for TPACK. However, it is useful for current study purposes as it introduces a cogent measurement type.

#### **2.4.13 Perception of TPACK for EFL teachers in Saudi Arabia**

Previous studies focused on elements of TPACK in EFL learning within the Saudi Arabian setting (Al-Asmari, 2005; Al-Maini, 2008; Alshumaimeri, 2008). Nevertheless, none of these determined how technological changes support the use of CPK along with TK in teaching EFL in Saudi Arabia. Thus, there is an urgent need for a study that focuses on the measurement of TPACK among Saudi Arabian EFL teachers.

#### **2.4.14 EFL teachers' perception of TPACK**

According to Niess (2008), EFL teachers have to pass through five stages in order to apply technologies in teaching the English language. These stages are "recognizing, accepting, adapting, exploring and advancing." (p. 5297). The following subsections discuss studies that have dealt with each of these stages, particularly in the area of English language learning.

A) *Recognise technology.* Teachers must be able to use new technologies and recognise their alignment with English language teaching. The essential stage of TPACK perception is the ability to actually use existing technology, and then recognise the importance of such technology in the classroom. Chen (2010) investigated some models for pre-service teachers' use of technology in supporting a student-centred learning environment, and found that one factor that significantly affected the effectiveness of the implementation was the teacher's own familiarity with the given technology. Similarly, Simpson (2010) pointed out that in integrating technology with literacy classes, it is essential for the teachers themselves to have some level of proficiency with the devices. It is much more difficult to introduce a teacher to a technology environment if the teacher himself/herself is not competent in operating that technology. Simpson (2010) argued that it was only practical for professional development programs that aim to create technology-aided language learning environments to capitalise on teachers' current competence with the technology and the Internet. This is particularly the case for the creation of technology-aided language learning environments, since the use of such technologies is not just a matter of ability but also a matter of culture. Schmid's study (2010) shows a concrete example who sought to develop competencies in the use of interactive whiteboards in an EFL classroom. The study found that teachers who were already competent with the use of computers were able to very easily transfer their prior knowledge to the new electronic whiteboards. Teachers recognised the possibilities of electronic



whiteboards in their classrooms more vividly because they were familiar with some of their elements.

*B) Accept technology.* Teachers' attitudes toward teaching English with appropriate technologies should be able to polish. Once teachers are competent with the use of technology and are aware of the possibilities of using such technology in the language learning classroom, the next step is developing teachers' attitudes towards the pedagogical use of such technology in language learning. Studies that have investigated this stage include Wiebe and Kabata (2010), who found that instructors' attitudes towards the use of technology range from enthusiasm to apprehension. Some teachers look forward to the educational value and convenience that technology may add to the classroom (Wiebe & Kabata, 2010). Many teachers were found to believe that making use of technology can expose students to more real-life situations in that their ability to make use of the language can be genuinely developed (Wiebe & Kabata, 2010). However, in contrast to this positive attitude, other teachers believed that implementing new technology would require more effort on their part, while others believed that technology would not add significantly greater instructional value or produce more effective learning outcomes (Wiebe & Kabata, 2010).

*C) Adopt technology.* Teachers engage in activities that lead to a choice to adopt or reject teaching English with appropriate technologies (a decision). Once teachers' attitudes towards the use of technology in teaching EFL are positive, such teachers would be ready to undergo the next stage of TPACK

development, which is training to use technology for language learning in the classroom. While teachers may have the appropriate prior knowledge and attitudes to implement lessons using their TPACK, Schmid (2010) asserted that this would not be enough to function effectively in a computer-assisted learning environment. Rather, teachers need to know how to use the technology specifically for the purpose of enhancing learning experiences and producing better learning outcomes (Schmid, 2010). As Schmid showed, teachers who made use of interactive whiteboards in their classroom needed to first understand (through professional development activities) how communicative language teaching of English could be correctly conducted using the new technology. Interviews with teachers showed that the adapting intervention used in the study enabled them to more fully understand the potential of the interactive whiteboard as a teaching tool, which meant they were able to use it more effectively and with greater confidence (Schmid, 2010). Another study relevant to technology adoption was conducted by Kilickaya (2009), who found positive effects from introducing pre-service English teachers to a technology-enhanced language learning course that integrated their TPACK strategies.

*D) Explore technology.* Integrate teaching of English with appropriate technologies (implementation) is technology exploration. The fourth stage of TPACK development is exploration. In this stage, the teacher implements technology-enhanced language learning strategies in his or her classroom. As Levy and Kennedy (2010) discussed, the implementation of TPACK-based

strategies is an exercise in continuous improvement, particularly on the level of the individual educator. In their study, the development and subsequent implementation of materials for projects requiring TPACK resulted in various issues of effectiveness and convenience of use being uncovered and redressed (Mike Levy & Kennedy, 2010). Egbert, Huff, McNeil, Preuss and Sellen (2009) presented similar outcomes in considering teachers' experiences of the implementation of technology-enhanced language learning environments. Teachers who implemented different TPACK-based strategies generated diverse ideas and assessments of the applicability of their strategies and their further improvement. In another case, Al-Fadda and Al-Yahya (2010) reported that teachers who used blogs as a tool for encouraging pre-class reading and post-class reflections received mixed responses from their studies that led to corresponding assessments and suggestions for improvement.

*E) Advance technology.* In this stage, teachers evaluate the results of the decision to integrate teaching English with appropriate technologies.

Teachers making use of their TPACK in their classrooms must be able to evaluate objectively whether the use of technology in the language learning classroom is achieving its goals. Towards this fifth element of TPACK development, Yang, Chen and Jeng (2010) reported that interviews (conducted with teachers after their integration of video-capture virtual reality technology into a physically interactive learning environment for English learning) showed that they were generally happy with the new

system and believed that the system was beneficial for students' learning needs. In contrast, teachers who implemented a different TPACK teaching strategy reported that technology did not yield the desired outcomes, primarily because older learners were very resistant to it (Ebsworth, et al., 2010).

## **2.5 FACTORS AFFECTING THE PERCEPTION OF TECHNOLOGY ENGAGEMENT WITH EFL TEACHERS**

Various factors affect the ability of EFL teachers to integrate technology in the teaching process. Kessler (2010) and Tokmak, Yelken and Konokman, (2013) both focused on teachers' willingness to learn about and make use of TPACK strategies in their classrooms. Kessler (2010) found that many teachers were unwilling to learn more about and eventually make use of computer-assisted techniques in language learning because of various apprehensions. Such respondents believed "that CALL threatened the teacher in a myriad of ways" (p. 376), such as by making them learn about technology applications with which they were unfamiliar, or reducing their authority because their students knew more about the technology used in pedagogy than they did due to greater exposure to computers and the Internet. Tokmak, et al. (2013) found that teachers who were more willing to try out strategies involving TPACK framework were also more successful in implementing them, and that having a positive attitude about one's competence in making use of technology created greater willingness to apply such competence to language teaching and learning technologies.

The literature shows that leadership, availability of resources and engagement incentives are important factors. Kabilan (2009) found that a significant element of the successful implementation of TPACK framework in a particular institution was the school administration's active involvement and concrete participation in the activity. Kabilan (2009) stated that the school leadership was technically responsible for the initiation of TPACK development implementation on various levels. First, on an organisational level, a school's administration must be able to express clearly to faculty members that they expect them to engage in professional development and cultivate willingness to make pedagogical use of technology in their respective classrooms (Kabilan, 2009). Without this initiative, teachers would not feel that engaging with modern technology in their teaching is a concern for the administration. If it is not important to their leaders, it would follow that the teachers would also consider the issue as insignificant to their practice (Kabilan, 2009). Second, on a resource level, a school administration has the authority to implement technology in the language learning environment. Furthermore, school administrations have the essential resources and facilities to organise professional development geared towards helping teachers gain the willingness and readiness necessary to make pedagogical use of technology in their classrooms (Kabilan, 2009). Administrative bodies likewise have the authority to require teachers to actually attend professional development activities and apply what they learned from such activities in their practice. Lastly, administrations can

provide incentives to faculty members for successful implementation of TPACK framework strategies. These might raise the motivation of teachers to do so and make it even more likely for them to participate in professional development activities that would sharpen their pedagogical use of technology.

Other studies suggest that the interplay of demographic variables determines whether or not a teacher is likely to engage technology in preparing and implementing learning environments for his or her students (Chua & Jamil, 2012; Feyrer, 2007; Nackerud, Fransen, Peterson & Mastel, 2013). According to Davies (2009), teachers from generations who grew up with computers, digital games and other modern technology are more likely to make use of the same technologies in their profession. Furthermore, Davies (2009) explained that teachers with more years of experience are less likely to believe that making use of technologies can significantly improve their teaching practices and their students' learning outcomes, particularly if (in their opinion) their current methods are already working at optimal levels.

It is clear from available literature that several factors affect the engagement of teachers with technology, and ultimately, their actualisation of TPACK in the classrooms. While some of the identified factors, such as Technical and Vocational Training Corporation (TVTC) administration, are beyond the control of this particular study, others (such as those dealing with the willingness of teachers to engage in language learning technology) are within this study's context and can be dealt with accordingly. The above

discussion of the literature also reveals significant shortage and deficiencies to the perception of TPACK in EFL teachers that ought to be addressed in this and succeeding studies.

## **2.6 CONCEPTUAL FRAMEWORK**

It was important to find a conceptual framework that covers all aspects of the research. Two conceptual frameworks were identified to examine research dimensions. The model of teaching with technology showed the perception of EFL teachers and formed connections between research dimensions. However, TPACK framework connected the relationships between various TPACK knowledge components to EFL teachers.

### **2.6.1 Teaching with technology model**

Teachers, in order to increase their range of approaches to creating an interactive learning environment, have used various models of teaching. When used intelligently, models of teaching enable teachers to adapt themselves to the learning needs of their students. With recent advancements in information technology, innovative teaching models that incorporate technology have been developed. Indeed, research has endeavoured to investigate the components contained in a technology-incorporated teaching model. The instructor, course content and technology tools were the components considered in this discussion (see Figure 1).

Emerging teaching models had four components: the students, the instructor, course content and technology tools (Zhu & Kaplan, 2001).

However, as in other research, this research ignores the student component in its consideration, as students were not part of the research. Therefore, the focus of the research is on three components, which are the instructor, course content and technology tools.

The model applied a systems approach, which allowed the components of the model to be perceived as part of the learning process (Ji, 2010). Additionally, it allowed each component to be considered in relation to the other components of the model. Therefore, examining each component of the model raised pertinent issues regarding the ways in which integration of technology might be successful in a classroom or classroom setting (Zhu & Kaplan, 2001).

The instructor component dealt with the role of the EFL teacher in the technology integration process, the level of technological skill and the availability of time spent by the EFL teacher in integration activities. Within this component, the willingness to learn by the teacher was also considered because it influences the technological skill level of the teacher.

The course content component dealt with EFL in technical colleges and the expected learning outcomes. Consideration of the teaching style provided an indication of the amount and type of the learning input by the



EFL teachers as they integrated technology into their EFL lessons while integrating technology.

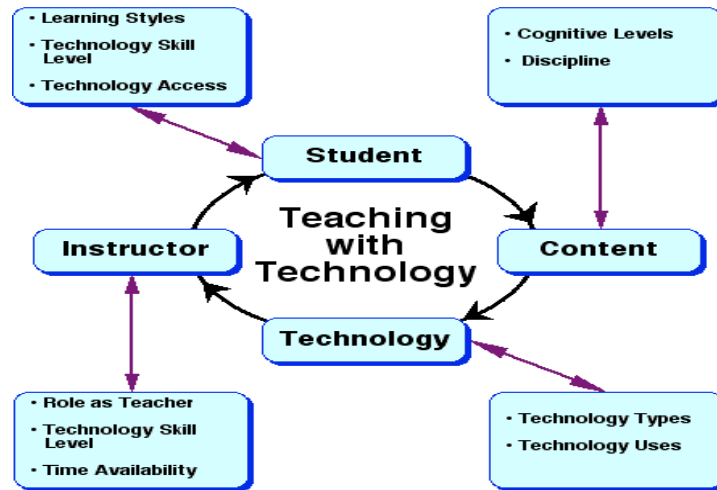


Figure 1: Teaching with Technology Model (Zhu & Kaplan, 2001)

The technology component of the model dealt with the types of technologies available for the teaching and learning process. In addition, how each technology was applied in the teaching process was considered in the examination of the model.

A teaching with technology model was used in the research. In particular, three components were considered in the research: the instructor, the course content and the technological tools. Although models of teaching with technology have four components, the student component has not been considered in this case, as students were not included in the research. In order to cover the research dimensions, the application of the teaching with technology model covered EFL teachers' use of technology, teachers' willingness to use technology and TPACK.

### 2.6.2 TPACK model

The Technological Pedagogical Content Knowledge (TPACK) conceptual framework (Figure 2), embraced by Mishra and Koehler (2006), underpins much of the national directions for describing the use of ICT in learning and in professional teaching. The TPACK framework “attempts to capture some of the essential qualities of teacher knowledge required for technology integration in teaching, while addressing the complex, multifaceted, and situated nature of this knowledge” (Mishra & Koehler, 2006, p. 1017). The focus was on the complex relationships between three forms of knowledge: pedagogical knowledge (PK), content knowledge (TK); and technological knowledge (TK).

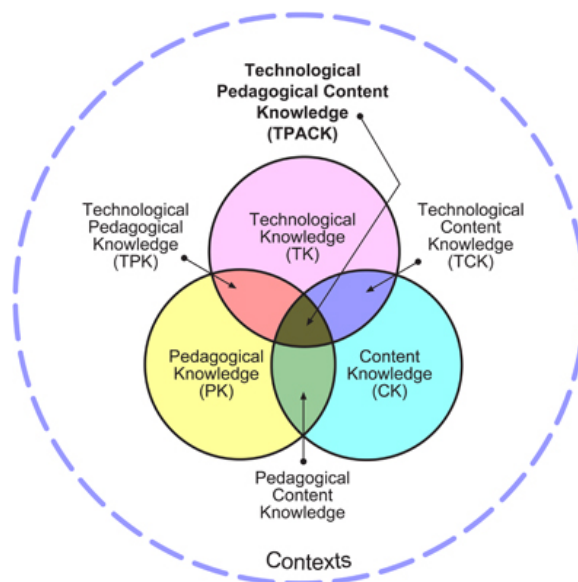


Figure 2: TPACK Model

Indeed, the TPACK model is based on the belief that true technological integration in the teaching process requires the comprehension and negotiation of the relationship between the three components of knowledge, which are pedagogical content knowledge (PCK), technological content knowledge (TCK) and technological pedagogical knowledge (TPK) (Koehler & Mishra, 2008). The intersections of the knowledge are important in the model, suggesting that researchers need to describe where EFL teachers are in the model.

## **2.7 GAPS IN THE LITERATURE**

The academic literature is rich with studies that have tackled various aspects of EFL instruction in Saudi Arabia. Al-Asmari (2005) focused on the extent to which EFL teachers integrate the Internet into their instructional practices, and Alshumaimeri (2008) determined EFL instructors' attitudes towards technology and found them to be related to technology proficiency levels. However, no studies of EFL instruction in Saudi Arabia have focused primarily on TPACK. The two studies mentioned above concentrated on the technology aspect, ignoring pedagogy and content knowledge in the Arabian EFL setting. Thus, no existing research considers the entire concept of TPACK as it applies to Saudi Arabian EFL faculties. The TPACK concept in the Arabian EFL setting is the research gap that this study intends to fill.

As shown in the literature review above, there is a great deal of research that deals primarily with TPACK in settings other than Saudi

Arabian EFL teachers. Previous researchers include Archambault and Oh-Young (2009), who found high knowledge levels among K-12 teachers in the United States across areas of pedagogy, content and pedagogical content, but found that technology knowledge was less developed. Cox and Graham (2009) developed a diagrammatic representation of the TPACK model based on input from an American setting. Harris, Mishra and Koehler (2009) focused on the construction of a framework for the practical implementation of TPACK in student activities in the United States, and Koehler and Mishra (2009) developed a TPACK framework recommended for successful implementation in American classrooms. In addition, Niess (2008) described the stages of TPACK learning by examining the training of teachers in mathematics, and Polly and Brantley-Dias (2009) developed imperatives for rethinking teacher education in the United States in order to facilitate subsequent integration of technology into classrooms and teaching approaches. However, none of the abovementioned studies were specifically directed at English language learning, let alone English language learning for non- native speakers. Thus, while there is an abundance of information available on TPACK, research with respect to its application in EFL is non-existent. Of all the studies reviewed above, only Hughes (2000) considered TPACK in an English language learning context. However, Hughes (2000) focused on a US setting, with the context being ESL rather than EFL instruction.

The implications of TPACK are clear. First, most of the existing literature refers to US settings, but the educational system in the US is very different from the educational system in Saudi Arabia, and major differences in culture and other demographics make inferences from studies in an American educational setting inapplicable to a Saudi Arabian educational setting. Second, EFL and ESL teaching and learning are very different. ESL students can practice their English in their local environment, while EFL students live in an environment dominated by their native language. Thus, studies of ESL instruction like have little relevance to EFL as the educational system is quite different (Koh, Woo & Lim, 2013). Lastly, most of the studies reviewed above focused on pre-service rather than in-service teachers, who are the target of the current study. Thus, TPACK in the Saudi Arabian EFL instructional setting is a topic ripe for investigation.

## **2.8 Summary**

Two conceptual frameworks were used to deal with research dimensions. Teaching with technology models and the TPACK framework were used to investigate the relationships among these dimensions. TPACK is a framework that deals with the three main combinations of knowledge in teaching (technology knowledge, pedagogical knowledge and content knowledge) in order to implement new technology in EFL classrooms. As a consequence, a good EFL teacher must gain TK, PK and CK skills for use in the classroom. EFL teachers go through several stages to implement technology in their teaching. Knowing teachers' perspectives towards

technology-supported learning is essential in order to measure EFL teachers' perception of TPACK. Willingness is considered to be the factor that most strongly influences the successful application of the TPACK framework. Factors that affect the perception of EFL teachers' technology engagement must be taken into account.

The review of the literature on EFL teachers' use of technology, willingness and their level of TPACK presented above showed that there is a need for this study in areas that have previously not been investigated.

The following chapter presents the methodology of the main study in order to examine EFL teachers' perceptions of technology use, perceptions of TPACK and their associations with EFL teachers' willingness.

## CHAPTER THREE

### Methodology

This chapter describes the methodology that was applied to the larger study. The methodology chapter should contain all of the components of the study so that other researchers can repeat the process and verify the outcomes (Schweizer, Steinwascher, Moosbrugger & Reiss, 2010). In addition, the methodology chapter should include measurement of the quality of the study in terms of reliability and validity (Chen, Chen & Liu, 2010).

The broad aim of the study was to investigate the association between EFL teachers' use of technology to support learning with their willingness to use technology to support learning and their perception of TPACK, and to identify any barriers in the use of technology to support learning. Data were collected using an online survey (tested in the pilot study) of EFL teachers working in technical colleges across Saudi Arabia. These quantitative data were augmented by qualitative interviews, which explained disparities in teachers' perceptions of willingness and TPACK and barriers to technology use in the classroom in greater depth.

Mixed method research provides strength that offset the weaknesses of both quantitative and qualitative data (Creswell & Plano-Clark, 2011, p. 12). Mixed method research helps to answer questions that cannot be answered by either quantitative or qualitative data. Explanatory sequential designed were used to collect the data (Figure 3). The data collection

procedures in the explanatory design involve first collection quantitative data, analysing the data and then using the results to inform the following up qualitative data collection (Creswell, 2013; Creswell & Plano-Clark, 2011).

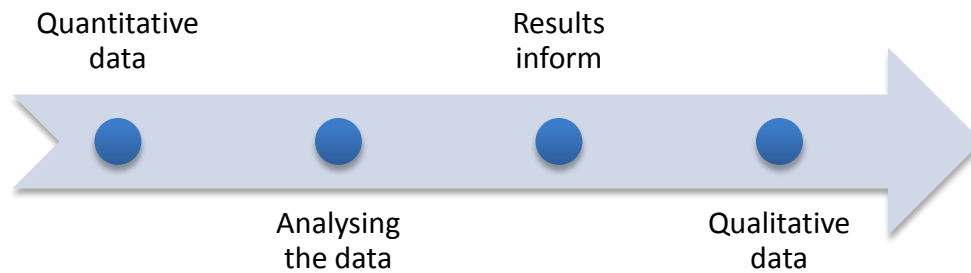


Figure 3: Explanatory sequential design

In the following sections, the participant selection process and the construction of the data gathering instruments are described, the data collection protocols and the data analyses are explained, and lastly, the validity and reliability of the methodology are considered.

### 3.1 PARTICIPANTS

All EFL teachers working in technical colleges across all regions in Saudi Arabia were eligible to take part in the study. At the time of the study there were 467 EFL teachers (all male) working at 34 technical colleges in 13 provinces in Saudi Arabia. About 20% ( $n = 93$ ) of those teachers had to complete office work. They were not practicing teaching due to a critical shortage of administrative workers in the technical colleges (TVTC, 2013).



The participants were at least 23 years old, as this is the usual age to graduate from a university and begin teaching in technical colleges. A Bachelor's degree is a minimum qualification for teaching. The number of EFL teachers earning a Master's degree overseas has increased due to a scholarship program recently adopted by the TVTC. TVTC administration did not support studying for doctorate holders, nor did they encourage staff to study for doctorates overseas. Despite this, there are a number of EFL teachers who possess a doctorate.

### **3.2 DATA COLLECTION INSTRUMENTS**

Data were collected using two instruments: an online survey and an interview. Both instruments are now described in detail.

#### **3.2.1 Online survey**

An online survey is a data gathering tool administered over the Internet (Archambault & Oh-Young, 2009). The Qualtrics' online survey platform was used to gather data from the participants. The selection of an online survey over methods such as field administration (e.g., Al-Asmari, 2005; Alshumaimeri, 2008), was determined based on five factors.

The first factor was the very large geographical area over which the study population was spread. This study sought to generate outcomes that could be generalised for the entire population of EFL teachers in Saudi Arabian technical colleges. The researcher had neither the time nor financial resources to travel across Saudi Arabia to conduct field administration of the

survey. Second, the manual collection of data would have been difficult to organise. While interviews could have been conducted in later stages, an online survey would be useful to collect Saudi Arabian EFL teachers' telephone numbers. Third, the use of the Internet to deliver the survey was more convenient than manual delivery for both researcher and participants. Each participant had a personal computer as part of his standard work environment and access to the Internet; thus, all had easy access to the online survey. Fourth, conducting the data collection through an online survey made contact with participants more formal, since the researcher's invitation emails were accompanied by official correspondence certifying that the study had official approval and asking for teachers' participation. Lastly, the use of an online survey made data analysis very convenient, as all the data were collected in digital format, compiled into a spreadsheet and analysed using computer-based statistical tools.

All items were presented in English with an Arabic translation. Translation was done to facilitate understanding of terminology in the survey items that participants might have found confusing. Online survey translation was not done in the pilot study, but the researcher used this technique, as there was new terminology that might confuse participant. The researcher translated the survey items from English to Arabic and a translator was engaged to translate back to English to confirm the translation.

### **3.2.2 Interview**

The purpose of the interview was to explore disparities between EFL teachers' perceptions of willingness to use technology to support learning and their actual use of it. The interview included identifying any inhibitors and enablers of technology use. An interview protocol was developed based on responses to the online survey. The interview was recorded and conducted in English, but the interviewee could ask for clarification in Arabic if necessary.

### **3.3 ONLINE SURVEY INSTRUMENT**

The online survey consisted of four sections. The first section was demographics that contained four items asking about the participants' age, qualifications, employment location and years of experience in teaching EFL. The second section targeted participants' use of technology to support learning and contained 12 items. The third section surveyed EFL teachers' willingness to use technology, and contained 16 items dealing with the five components of willingness (see section 4.3.3). The fourth section targeted TPACK and contained 28 items that covered the three knowledge levels of combination between the three main bodies of knowledge (technology, pedagogy and content).

The Demographics and Willingness items were developed by the researcher and tested in the pilot study. Items relating to Use of Technology and TPACK were adapted from previously reported inventories of items

(and these sources are presented in section 3.4 and 3. 6). ‘Technology’ was defined for potential participants as referring to computers and related applications and other digital technologies such as printers, scanners, data projectors and electronic whiteboards.

### 3.3.1 Demographics

The Demographics section had four items (Table 3.1) dealing with factors that might affect the EFL teachers’ perceptions of use of technology: location, age, qualifications and years of teaching experience.

Table 3.1  
*Survey Items: Demographics*

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Item 1:	Which college do you currently work for?
Item 2:	How old are you?
Item 3:	What is the highest qualification in English language teaching you have achieved?
Item 4:	How many years have you been teaching English?

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## 3.4 USE OF TECHNOLOGY TO SUPPORT LEARNING

As established in the literature review, use of technology in the classroom can enhance the learning of the English language; thus EFL teachers require extensive access to such technology (Margaryan, Littlejohn & Vojt, 2011). Twelve survey items (Table 3.2) were used to determine the perception of EFL teacher’s use of technology to support learning.

Justifications for inclusion of these items are presented in Table 3.3.

Eleven of the survey items were based on Part Three of the Papanastasiou and Angeli inventory (2008, p. 83) designed to measure the frequency of software use for teacher's purposes. Four items from Papanastasiou and Angeli inventory (2008, p. 83) were not used, as they were not appropriate for this study because they focused on advanced programming or complex systems. The remaining survey item (item 11) was developed by the researcher to cover the software used, particularly in language teaching. A five-point Likert scale was used for each item: strongly agree, agree, neutral, disagree and strongly disagree. Values ranged from 5 for strongly agree to 1 for strongly disagree. This scale was based on the scale used by Papanastasiou and Angeli's (2008), but with scale order reversed, as Weng and Cheng (2000) indicated that response order had no substantial influence on participant responses and scale characteristics. The scale score is calculated and reported by using means, standard deviation and percentages for each item to assist in understanding participants' performance.

Table 3.2  
*Survey Items: Use of technology to support learning*

In my classroom, I use technology to:	
Item 5:	Create and edit text (e.g., Word)
Item 6:	Create presentations (e.g., PowerPoint)
Item 7:	Create graphics (e.g., Paint)
Item 8:	Communicate by text (e.g., chat, email)
Item 9:	Communicate with visuals (e.g., Skype, videoconference)

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Item 10:	Access the Internet to gather and have information
Item 11:	Access online tools (e.g., dictionary, translator, thesaurus)
Item 12:	Demonstrate educational software (e.g., CD-ROM, learning objects)
Item 13:	Map concepts (e.g., Kidspiration, Inspiration)
Item 14:	Develop web pages (e.g., FrontPage)
Item 15:	Develop multimedia (e.g., HyperStudio)
Item 16:	Engage in virtual worlds, simulations (e.g., Second Life)

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Table 3.3

*Justification of inclusion items of use of technology to support learning*

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Item	Justification for inclusion
5	Creating and editing text is a useful way to facilitate English language teaching strategies (Collins, 2004).
6	Creating presentations is a helpful strategy to promote effective English language learning (De, Dolmans, Donkers, Muijtjens & Van, 2010).
7	Using painting and graphics packages simplify English language learning (Ilea, Mirea & Grecu, 2004).
8	Using email, mobile text and chat in communication in the classroom can improve the learning of English process (Shihab, Jiang & Hassan, 2009; Zhou, Fleischmann & Wallace, 2010).
9	Using visuals to communicate with others increases the capacity to learn English language effectively (Bostrom, Anselin & Farris, 2008).
10	Accessing the Internet in the classroom promotes and supports English language learning (Conroy, 2010).
11	Accessing online tool would provide a definition, pronunciation, etymology written and audio pronunciation of a word (Bulson, 2010).
12	Using CD-ROM may contains free or open source software, which will help EFL teachers to produce their own ICT based learning objects, learning equipment (Larson, 2010).
13	Using technology software enable EFL teachers to construct concept maps that represent their own English language learning knowledge

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(Ferry, 1996) .

- 14 Being able to build web pages for English language teaching can enhance learning (Ionescu, Mihalcioiu, Covaci & Bratu, 2009).
  - 15 Being able to construct multimedia by combine text, sound, graphics, digital video, and animation create teaching materials without resorting to another software program enhance the English language learning (Wang, 2010).
  - 16 Using simulated educational environment in the classroom enhance the English language learning (Pricer, 2010).
- 

### **3.5 WILLINGNESS TO USE TECHNOLOGY TO SUPPORT LEARNING**

The literature review (Chapter 2) showed that willingness to use technology plays an important role in determining EFL teachers' willingness to support learning: "Willingness is the quality or state of being willing; free choice or consent of the will; freedom from reluctance; readiness of the mind to do or forbear" (Cassidy, 1992, p. 200). The willingness category had 16 constructed items to measure the perception of willingness to use computers to support student learning in the classroom (henceforth simply termed 'willingness'). Each survey item asked the participant to select the most appropriate response using a five-point Likert scale (Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree). The scale score is calculated and reported by using means, standard deviation and percentages for each item to assist in understanding participants' performance.

The 16 items covered five components that are known to contribute to teachers' willingness in relation to computer use in the classroom:

- attitudes;
- anxiety;
- self-efficacy;
- motivation; and
- goal-setting.

‘Willingness’ measures the extent to which EFL teachers consider the use of technology in EFL teaching to be an important consideration, and so is critical to determining the disparity between willingness and use of technology within the context of this study. A five-point Likert scale was used for each item. Values ranged from 5 for the highest level of response for an item to 1 for the lowest level of response for an item. Weng and Cheng (2000) indicated that response order had no substantial influence on participant responses and scale characteristics.

### **3.5.1 Attitudes towards computer use in the classroom**

Chapter 2 presented the notion that teachers’ attitudes affect their willingness to use technology in the classroom. This component was measured with three items (Table 3.4). The justifications for the attitude items are presented in Table 3.5.

Table 3.4  
*Attitude towards computer use in the classroom*

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5:	I believe that students should have access to technology in every classroom.
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- 6: I believe that students enjoy using technology in the classroom.
- 7: I believe that students will learn more if technologies are used in the classroom.
- 8: I think that using technologies in the classroom will make teaching simpler
-

Table 3.5  
*Justifications for attitude items*

Item	Justifications for inclusion
5	Teachers' belief in the value of access to technology in the contemporary classroom increases the likelihood of higher levels of computer use (Becker, 2006).
6	Teachers' beliefs regarding students' enjoyment when using technology in the classroom can be attributed positively to learning (Yang, et al., 2010).
7	Teachers' attitudes in regard to the effectiveness of using technology in the classroom has been noticed by researchers (Ismail, et al., 2008).
8	Teaching processes may be simpler when technological convenience is offered (Ploog, Scharf, Nelson & Brooks, 2013). Teachers who think that computers would bring them convenience are logically more willing to try using computers in the classroom.

### 3.5.2 Anxiety towards computer use in the classroom

Chapter 2 presented the notion that teachers' anxieties strongly influenced their willingness to use technology in the classroom. This component had four items (Table 3.6). The justifications for anxiety items are presented in Table 3.7.

Table 3.6  
*Anxiety towards computer use in the classroom*

9:	I think that using technology to facilitate teaching will be boring for my students.
10:	I think that using technology in the classroom will interfere with my teaching.
11:	I feel nervous about having to use technology while teaching.

Table 3.7  
*Justifications for the anxiety items*

Item	Justifications for inclusion
9	It is necessary to concentrate on teachers' beliefs about whether students will be engaged by the use of technology to support their learning. If the teacher thinks that computers will be unengaging for students and affect their attitude negatively, then it is reasonable that the teacher would not be willing to use them (Wiebe & Kabata, 2010). A shift in technology alternatives to the traditional tutorial technology programs has taken place to facilitate the teaching process (Otto & Pusack, 2009).
10	Teachers' perceptions of whether technology interferes with the teaching process were a critical matter to determine the extent of teacher anxiety. Research conducted in the early 2000s revealed that some teachers believed that using technology would hinder their normal teaching practices (Michael, 2001).
11	Being nervous about using computers indicated that a teacher would be less willing to use them in the classroom (Kim, 2009).

### 3.5.3 Self-efficacy towards computer use in the classroom

As noted in the literature review, teachers' self-efficacy directly affects their willingness to use technology in the classroom. This component was represented by three items (Table 3.8). The justifications for the self-efficacy items are presented in Table 3.9.

Table 3.8  
*Self-efficacy towards computer use in the classroom*

12:	I feel confident learning about new software or tools (e.g., PowerPoint) on the computer.
13:	I feel confident when I use technology for teaching in the classroom.
14:	I feel confident when assisting my students to use computers in the classroom.

Table 3.9  
*Justifications for the self-efficacy items*

Item	Justifications for inclusion
12	Confidence in using software at a personal level is a very important part of self-efficacy (Khorrami-Arani, 2001). Teachers who feel confident in learning about computer software are almost certainly more willing to use technology in their classroom.
13	Using technology to teach is the next step after new technology software deeply confidence to determine how confident respondents are about using technology at the workplace (Semiz & Ince, 2012).
14	Research has shown that teachers' experience in computer use enables them to assist students more effectively (Efe, 2011). Confidence in assisting students can be considered as an indicator of greater willingness to use computers in the classroom.

### 3.5.4 Motivation towards computer use in the classroom

Previous studies indicated that teachers' motivation could affect their willingness to use technology in the classroom (Alshumaimeri & Almasri, 2012; Fang, 2010; Liton, 2012; Yang, et al., 2010). This component was covered by three items (Table 3.10). The justifications for the motivation items are presented in Table 3.11.

Table 3.10  
*Motivation towards computer use in the classroom*

15	I want to use technologies in the classroom because it will make my teaching more interesting.
16	I want to use technology in the classroom because it will improve my students' learning.
17	I want to find new and interesting ways of using technology in the classroom.

Table 3.11  
*Justifications for the motivation items*

Item	Justifications for inclusion
15	Teachers' desire to improve their teaching by using technology develops an interactive learning environment (Sasaki, 2011).
16	Using computers to improve learning is a direct expression of the willingness to use technology (Ward & Parr, 2010).
17	Bate and Maor (2008) suggested that teachers may be likely to mix computers into their teaching if the uses are innovative.

### 3.5.5 Goal-setting in relation to computer use in the classroom

As noted in the literature review, goal-setting interrupts teachers' willingness to use technology in the classroom. Three items (Table 3.12) are represented in this component. The justifications for the goal-setting items are presented in Table 3.13.

Table 3.12  
*Goal-setting towards computer use in the classroom*

18:	I prepare short lesson plans for myself in relation to technology use.
19:	I prepare semester length plans that include the use of technology in the classroom.
20:	I prepare plans that include new and interesting ways to use technology in the classroom.

Table 3.13  
*Justifications for the goal-setting items*

Item	Justifications for inclusion
18	Teachers' preparation of short lesson plans would make learning outcomes clear and let the goals flow easily and logically (Hayes & Ohrnberger, 2013).
19	Teachers' preparation for semester-length plans would provide a variety of ways to practice with technology (Wright, 2010).
20	Prepared plans that include innovative uses of technology in the classroom would make teachers willing to use technology. Ebsworth, Kim and Klein (2010) stated that teachers should fully integrate IT into their teaching practices and, thereby, reap the maximum benefits of the application of technological innovations.

### 3.6 TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (TPACK)

In the literature review, TPACK was referred to as the stage at which teachers know how to use technology devices as part of their pedagogy in helping students learn the target content (Brupbacher & Wilson, 2009). Koehler and Mishra (2009) described TPACK as a complex interaction among three bodies of knowledge: content, pedagogy and technology.

The literature review pointed to a number of studies that influenced the construction of items to measure the components of TPACK. These influences varied from one study to another. Some studies inspired and directly influenced the construction of survey items; others were either adapted or constructed based on ideas from previous inventory.

The TPACK section of the survey has 28 items that represent the seven components of TPCK. A five-point Likert scale was used for each item: strongly agree, agree, neutral, disagree and strongly disagree. Values ranged from 5 for strongly agree to 1 for strongly disagree. The scale score is calculated and reported by using means, standard deviation and percentages for each item to assist in understanding participants' performance.

Non-technology TPACK components (CK, PK and CPK) were located at the end of the survey, as these do not directly relate to technology use. Seven items were adopted directly from Schmidt et al. (2009, p. 147), which met the goals of the study (Table 3.6). Five items were adapted from an existing items of Schmidt et al. (2009). The remaining 16 items were constructed based on ideas put forward by other scholars (Al-Othman, 2005; Barbara & Marsha, 2007; Borthwick, Charles & McPherson, 2010; De, et al., 2010; Fischer, Bol & Pribesh, 2011; Harris, et al., 2009; Jamieson-Proctor, et al., 2010; Klassen & Chiu, 2010; Marotta & Hargis, 2011; Sargent, Allen, Frahm & Morris, 2009; Shihab, et al., 2009; Teo & Waugh, 2010). However, a different content knowledge component was developed in order to fit the survey to the EFL context of this study.

TPACK was considered to be associated with EFL teachers' perceptions of mastery for the three bodies of knowledge, separate or together. The three bodies of knowledge and their various combinations create seven components. These seven components are briefly explained below, with a justification of the items for each component.

### 3.6.1 Technology Knowledge (TK)

TK refers to knowledge of technological devices and innovations that teachers need, such as mobile technology, the Internet, blogs, wikis, electronic whiteboards and so on. Four survey items were adopted from Schmidt et al. (2009, p. 147) as it was appropriate for the study to determine participants' TK (Table 3.14). The source and justification for TK items are presented in Table 3.15.

Table 3.14

*Survey Items: Technology Knowledge (TK)*

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Item 33: I know how to solve my own technical problems.

Item 34: I have the technical skills I need to use technology.

Item 35: I can learn technology easily.

Item 36: I know about a lot of different technologies.

---

Table 3.15

*Sources and justifications for TK items*

Item	Source	Justification for inclusion
33	Adopted from Schmidt, et al. (2009, p. 145), as it is suitable for the study to measure technological problem solving.	It is necessary to create a problem solving environment in the productive teaching (Teo & Waugh, 2010). Accordingly, creating such environment enhance EFL teachers to be skilful with technological advances (Hyland, Pinto-Zipp, Olson & Lichtman, 2010).
34	Adopted from Schmidt, et al. (2009, p. 145), as it is suitable for the study to measure the need for technical skills.	There is often a substantial gulf between people's interest in technology and their skill in navigating and using it (Slattery, 2010).
35	Adopted from Schmidt, et al., (2009, p. 145), as it is suitable	While teachers enjoy using technology and find it useful, they



	for the study to measure the ability to learn technology.	often find prior technological preparation courses inadequate (Jimoyiannis, 2010). Accordingly, it is important to understand how confident EFL teachers are in learning new skills, as it is unlikely that any one course can prepare EFL teachers for all the necessary technologies they need over time in English language teaching.
36	Adopted from Schmidt, et al. (2009, p. 145), as it is suitable for the study to measure the knowledge of different type of technology.	EFL teachers tend to believe that they can learn a skill quickly, then become unnecessarily pessimistic after difficulties emerge (Graber, 2010). This is because people frequently overestimate their technology skills (Compeau, 2007).

### 3.6.2 Technological Pedagogical Knowledge (TPK)

TPK is the “understanding of how teaching and learning can change when particular technologies are used in particular ways” (Koehler & Mishra, 2009, p. 65). Four survey items (Table 3.16) were used to determine teachers’ TPK. Source and justification TPK items are presented in Table 3.17.

Table 3.16

*Survey Items: Technological Pedagogical Knowledge TPK*

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Item 37:	I use a variety of software (Word, PowerPoint, Photoshop, etc.) preparing for lesson plans.
Item 38:	I use a variety of software (PowerPoint, Flash, Word, etc.) when presenting lessons.
Item 39:	I use a variety of software (Word, PowerPoint, etc.) when evaluating students.
Item 40:	I can choose technologies that enhance teaching process.

---

Table 3.17  
*Source and justification for TPK items*

Item	Source	Justification for inclusion
37	Constructed based on Teo & Waugh (2010, p. 206) as involving technology in a lesson plan preparation consider fostering creativity.	To determine the extent of teachers' knowledge of technology as it is applied in their teaching practices.
38	Constructed based on Borthwick, et al. (2010).	Using technology applications in the classroom make the lesson even better (Wright, 2010).
39	Constructed based on Biggers, Forbes & Zangori (2013) and De, et al. (2010), as technology can be used to evaluate students.	Teachers use technology more for personal instructional reasons, such as class preparation and student evaluation (Holden, Ozok & Rada, 2008).
40	Adapted from Schmidt, et al. (2009, p. 134) Table 7 second item for TPK. Researcher believe that the focus should be on teaching process rather than student's learning in the classroom.	To determine the extent to which EFL teachers can choose particular technology to enhance teaching process. Although technology can enhance the teaching process (Riley College, 2010), many teachers find that they do not have the right technologies when they teach themselves how to use the technology.

### 3.6.3 Technological Content Knowledge (TCK)

TCK refers to the knowledge about the manner in that technology and content influence each other (Kereluik, Mishra & Kohler, 2011). Four survey items (Table 3.18) were developed to determine teachers' TCK. The justifications of these items are presented in Table 3.19.

Table 3.18

*Survey Items: Technological Content Knowledge TCK*

Item 41:	I know about technologies that I can use for understanding and learning the English language.
Item 42:	I look for online resources when selecting materials to use for my English language class.
Item 43:	I can communicate orally in English using technology (e.g., Skype, chat rooms Viber and Tango).
Item 44:	I view videos on the Internet that are in the English language.

Table 3.19

*Source and justification for TCK items*

Item	Source	Justification for inclusion
41	Adapted from Schmidt, et al. (2009, p. 147), as it is important to focus on the content of EFL.	To investigate EFL teachers' knowledge awareness of technology that can be used to enhance learning of the English language.
42	Constructed based on Harris, et al. (2009, p. 394), as online resources enhance the learning of English language.	EFL teachers' ability to find resources from the Internet is one of the prime technological content components of TCPK.
43	Constructed based on Shihab, et al. (2009, p. 107), as using technology gaining popularity among EFL teachers.	Orally communication technology and text based chat room have been identified as a valuable means for EFL teachers to practice their English mastery (Harrett & Benjamin, 2009; Lapadat, 2003).
44	Constructed based on Jamieson-Proctor, et al. (2010, p. 12), as watching videos encourages teachers to produce their own focus on language aspects.	Watching videos in English helps teachers develop language skills and stay connected with the language. The Internet is another medium through which the teacher can practice his English language comprehension, although extra technological skills are required to access the Internet.

### 3.6.4 Technological Pedagogical Content Knowledge (TPCK)

TPCK refers to the knowledge that emerges from an understanding of an interaction of content, pedagogy and technology knowledge (Kereluik, et al., 2011). It is an innovative way when teachers use technology devices as part of their pedagogy in helping students learn the target content. Four survey items (Table 3.20) were used to determine teachers' technological pedagogical content knowledge. The justifications of these items are presented in Table 3.21.

Table 3.20

*Survey Items: Technological Pedagogical Content Knowledge TPCK*

Item 45:	I have the ability to use technology in English language teaching.
Item 46:	I make my classes interesting and stimulating by using technology in English language teaching.
Item 47:	I can explain how the use of computers can help students to learn the English language.
Item 48:	I believe that it is important to make use of technology in teaching EFL.

Table 3.21

*Source and Justification for TPCK items*

Item	Source	Justification for inclusion
45	Constructed based on Harris, et al. (2009), as the ability to use technology enhances learning of the English language.	EFL teachers' confident use of technology in English language teaching is a clue to their aptitude in learning English via technology (Teo & Waugh, 2010).
46	Constructed based on Jamieson-Proctor, et al. (2010), as using technology influences English language	Using technology is a valuable resource and a very effective tool to stimulate interest and enhance fluency in the English language classroom

	teaching.	(Debbie Maria, 1998).
47	Constructed based on Shihab, et al. (2009) as using technology can help in learning EFL.	Teacher awareness of how computers or technology can help in the teaching of English gives the teacher insight into the students' learning needs (Gray, Harrison, Sheridan-Ross & Gorra, 2008).
48	Constructed based on Shihab, et al. (2009), as using technology is important in teaching EFL.	EFL teachers' perceptions of technology use in teaching EFL can be considered value perceptions (Lee & Tsai, 2010).

### 3.6.5 Content Knowledge (CK)

CK refers to knowledge of the subject matter (Koehler & Mishra, 2009).

Four survey items were developed to determine teachers' CK (Table 3.22).

Source and justification of CK items are presented in Table 3.23.

Table 3.22

*Survey Items: Content Knowledge CK*

Item 49:	I have sufficient knowledge about English language.
Item 50:	I have had extensive experience practicing English language in Western society.
Item 51:	I can develop an English language course.
Item 52:	I have various strategies of developing my English language (e.g., reading and watching).

Table 3.23  
*Justifications for CK items*

Item	Source	Justification for inclusion
49	Adapted from Schmidt, et al. (2009, p. 146), as it indicates level of confidence to teach the English language.	To know the EFL teachers' mastery over the English language. EFL teachers' mastery of the language is a fundamental element of content knowledge (Ventura et al., 2008).
50	Constructed based on Klassen & Chiu (2010), as teachers' years of experience showed nonlinear relationships with English language practice.	To determine EFL teachers' experience with the English language in Western society. Ventura et al. (2008) explained that experiencing a culture enables an individual to better understand the context of language and actions in that culture in comparison to the individual's own culture.
51	Constructed based on Al-Othman (2005), as there was a lack of English language curriculum.	Teachers were willing to design their own curriculum (Banegas, 2011). Society accepts and appreciates all curricula that are compatible with community needs, especially when overlap occurs between social and religious beliefs.
52	Adapted from Schmidt, et al., (2009, p. 146), as the focus must be on the English language.	Having a plan to read, write, listen and communicate every day is an effective strategy to keep in touch with English language. Harrett and Benjamin (2009) discussed that mastery of the English language is achieved through practice and use.

### 3.6.6 Pedagogical Knowledge (PK)

PK refers to the knowledge of teaching (Koehler & Mishra, 2009). It is a teacher's knowledge of all the processes and actual practices of teaching

and learning. Four survey items were developed to determine teachers' PK (Table 3.24). Source and justification of PK items are presented in Table 3.25.

Table 3.24  
*Survey Items: Pedagogical Knowledge PK*

Item 53:	I know how to assess student performance in the classroom.
Item 54:	I consider myself to be an experienced teacher with sufficient years of experience in pedagogy.
Item 55:	I know how to organise and maintain classroom management.
Item 56:	I can adapt my teaching style to different learners.

Table 3.25  
*Source and justification of PK items*

Item	Source	Justification for inclusion
53	Adopted from Schmidt, et al. (2009, p. 146), as it is appropriate for the study.	Teachers and faculty endorse student performance and suggest substantial assess utility (Battistone et al., 2002).
54	Constructed based on Sargent, et al. (2009, p. 526), as years of experience is a factor affecting the learning process.	To evaluates EFL teachers' confident of teaching experience. Lassen and Chiu (2010) pointed out that more experienced teachers have a greater knowledge of pedagogy.
55	Adopted from Schmidt, et al. (2009, p. 146), as it is appropriate for the study.	Classroom management and learning environment are intricately connected (Erdogan et al., 2010).
56	Adopted from Schmidt, et al. (2009, p. 146), as it is appropriate for the study.	EFL teachers have tremendous variation in their teaching behaviours and learning practices (Glenn, 2009).

### 3.6.7 Pedagogical Content Knowledge (PCK)

PCK is the amalgam of knowledge of pedagogy and particular learners that is applicable to the teaching of specific content (Kereluik, et al., 2011). PCK refers to the knowledge of strategies or activities that teachers can use in order to simplify the subject matter for clarity. Four survey items were used to determine teachers' PCK (Table 3.26). The justifications for these items are presented in Table 3.27.

Table 3.26

*Survey Items: Pedagogical Content Knowledge PCK*

Item 57:	I use diverse teaching strategies in facilitating the instruction of EFL.
Item 58:	I give tests in English as a foreign language subjects that address both lower- and higher-order thinking skills.
Item 59:	I implement teaching methods to help slow learners in my EFL class.
Item 60:	I can select effective teaching strategies to guide students in EFL.

Table 3.27

*Source and justification for PCK items*

Item	Source	Justification for inclusion
57	Constructed based on Barbara & Marsha (2007, p. 8), as the diverse pedagogical strategies enhance the learning of content.	EFL teachers' diverse teaching strategies can facilitate the instruction of EFL (Marotta & Hargis, 2011).
58	Constructed based on Fischer, et al. (2011), Miri, David & Uri (2007, p. 353), as there was a good chance for consequence development in PCK.	Types of assessments given by teachers as part of his/her PCK evaluation can improve the learning process, since the types of test determine the depth of knowledge that the teacher is able to impart to the students (Rohaan,



		et al., 2009).
59	Constructed based on Marotta & Hargis (2011, p. 377). Implementing different teaching methods improve student outcomes.	PCK evaluation would not be complete without determining the ways that the teacher helps slow learners and the ways that the teacher challenges gifted or advanced learners (Rohaani, et al., 2009).
60	Adapted from Schmidt, et al. (2009, p. 174) , as the focus of the study was on EFL.	The ability of selecting different teaching styles would measure EFL teachers' <i>confidence</i> and <i>knowledge</i> (Jamieson-Proctor, et al., 2010).

### 3.7 PILOT STUDY METHODOLOGY

There was a need to validate the online survey before starting the data collection process. Before undertaking the data collection for the main study from all Saudi Arabian technical colleges, it was important to check the feasibility of the methodology as well as the reliability and validity of the data collection process. The pilot study was a useful exercise that aimed to validate and shape the online survey.

The pilot study was conducted with a small number of EFL participants who were employed with technical colleges. The study targeted four technical colleges, which were the largest colleges in each of the four largest Saudi Arabian provinces.

The focus was on the willingness to use technology to support learning dimension of the online survey, which needed to be validated. The

selected dimension helped to bring out a general overview of teachers' perceptions on the use of technology in the classroom.

The pilot study used a slightly different way of collecting data in the beginning of 2010. The pilot study contributed effectively to improve and develop the final methodology for the main study. Further descriptions of the pilot study and how it shaped the rest of the study are detailed in Chapter Four.

### **3.8 INTERVIEW PROTOCOL**

An interview was conducted with a purposive sample of 10 participants, selected by focusing on perceptions of use of technology and willingness. Twenty-four participants agreed to be interviewed by responding to the open-ended item on the online survey. Standard deviation was the key factor to identify those with high scores for use of technology and low scores for willingness, those with low scores for use of technology and high scores for willingness, those with low score of use of technology with low score of willingness, and those with high score of use of technology with high score of willingness.

Responses to survey items identified in the quantitative analysis were examined further in the interview. 14 items were identified and discussed in more detail during the interview. Interviews were conducted via audio Skype, and lasted about 20 minutes on average.

The interview was conducted in English but the interviewee was advised that clarification could be provided in Arabic if necessary.

Pseudonyms were given to protect participants' identities. The interview had three objectives: to (i) to provide background about the researcher and the research; (ii) to re-confirm permission to record the interview; and (iii) to learn more about the respondents' views on items that received disparate responses in the online survey.

### 3.8.1 Items for the interview

Fourteen items were identified to raised and discussed in more details during the interview. Standard deviation was the key factor identifying these items in order to develop precise survey results. The 14 items are presented in Table 3.28.

Table 3.28  
*Survey items selected for the interview*

Code	Items	SD
Q7	Create graphics (e.g., Paint).	1.59
Q9	Communicate with visuals (e.g., Skype, videoconference).	1.49
Q 10	Access the Internet to gather and have information.	0.68
Q 11	Access online tools (e.g., dictionary, translator, thesaurus).	0.65
Q16	Engage in virtual worlds, simulations (e.g., Second Life).	1.48
Q17	I believe that students should have access to technology in every classroom.	0.48
Q18	I believe that students enjoy using technology in the	0.69

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	classroom.	
Q19	I believe that students will learn more if technologies are used in the classroom.	0.49
Q 22	I think that using technology in the classroom will interfere with my teaching.	1.20
Q31	I prepare semester length plans that include the use of technology in the classroom.	1.12
Q39	I use a variety of software (Word, PowerPoint, etc.) when evaluating students.	1.14
Q48	I believe that it is important to make use of technology in teaching EFL.	0.41
Q50	I have had extensive experience practicing English language in Western society.	1.66
Q53	I know how to assess student performance in the classroom.	1.5

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### 3.9 DATA COLLECTION PROCESS

On April 11, 2012, the researcher contacted the TVTC administration seeking permission for teaching staff to participate in the study and requesting that it forward invitations to all eligible staff. On June 25, 2012, the TVTC administration sent an invitation email to EFL teachers in all 34 technical colleges in Saudi Arabia. This email contained a link to the online survey that contains the consent button. EFL teachers who were willing to participate were asked to provide their contact information at the end of the online survey in case they would like to be interviewed. These prospective respondents were then contacted through email later and a convenient time to participate in the interview was agreed. All technical college EFL teachers

were invited to complete the online survey. Later, a selection of 10 respondents was chosen for interview as representatives of this sample.

There were six stages in the data collection process. All emails were sent to the participants via their technical supervisory department. The six-stage data collection process is presented next.

### **3.9.1 Online survey**

Stage one: Email with online survey access link (June 28, 2012).

An email inviting potential participants to complete the online survey instrument was sent by the TVTC on the researcher's behalf on June 28, 2012. This email contained a hyperlink to the online instrument and the information sheets. Once the EFL teachers clicked on the URL provided within the email, an informed consent page appeared; the page described the nature and purpose of the study, as well as possible benefits and risks. If the participants consented by clicking on a "Yes" button, they were directed to the survey items. Those who clicked "No" were directed to a screen saying "Thank you for your time".

Stage two: Reminder email

Ten days after sending the email invitation, a reminder was emailed the TVTC to all actual and potential participants on Thursday, July 10, 2012. Its purpose was to thank those who had already completed the survey and to ask those who had not completed the survey to do so as soon as possible.

This email also contained the link to the survey in case participants had accidentally deleted the original message, as suggested by Chisnall (2007).

#### Stage three: Follow-up email

Ten days after sending the first reminder email, another email was sent by TVTC to all actual and potential respondents. As recommended by Chisnall (2007), the tone of this reminder was more urgent in order to try to convince potential participants to respond to the survey instrument. Once again, the link to the survey was provided.

#### Stage four: Final email

On July 27, 2012, a final email was sent by TVTC to all actual and potential respondents. It gave the last possible date to participate in the study and thanked respondents for their participation.

#### Stage five: Interview

Participants were asked at the end of the online survey whether they were prepared to be interviewed by the researcher regarding their responses; if willing, they were asked to leave contact information. Ten of the participants who agreed to be interviewed were contacted after the survey responses had been reviewed. Ten respondents were deemed by the researcher to be appropriate representatives for the surveyed participants. After identifying the interviewee, a notification of interview was sent to arrange a time for the interview.

### **3.9.2 Interview**

Interviews were conducted and recorded between December 17, 2012, and January 14, 2013. At the conclusion of each interview the participant was thanked for taking part in the study.

## **3.10 DATA ANALYSIS**

This section describes the analysis of the data collected in the study. Data analysis included both quantitative and qualitative techniques. Quantitative analysis was undertaken on the data collected via the online survey. Qualitative analysis was undertaken on the data collected from the participant interviews. Both analyses explored the associations between the use of technology, perceptions of willingness and teachers' perception of TPACK.

### **3.10.1 Data analysis for the online survey**

The five-point Likert scale used for responses was given numerical values so that perceptions of use of technology, willingness and TPACK could be quantitatively analysed: Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2 and Strongly Disagree = 1 point. Higher total raw scores meant higher perceptions of use of technology, willingness and TPACK. Quantitative data analysis based on the data was gathered from the surveys using Rasch analysis (where the total score summarises a teacher's standing on each variable), frequency analysis, multivariate analysis of variance,

confirmatory factor analysis and inspection of group means and independent two-tailed t-tests.

### 3.10.2 Frequency analysis

Frequency analysis was employed to provide an overall assessment of the perception of each variable of respondents. To simplify data analysis, Likert scale responses were categorised according to a system described by Choy (2003). In this system, half of the percentage value of the neutral responses was redistributed to the Strongly Agree and Agree categories. The remaining half of the neutral category was redistributed to the Strongly Disagree and Disagree categories.

Responses were categorised and interpreted according to a system described by Choy (2003). In this system, half of the percentage value of the neutral responses was redistributed to the Strongly Agree and Agree categories and half to the Strongly Disagree and Disagree categories. The resulting percentages were presented in Table 3.29.

Table 3.29  
*Frequency analysis criteria*

Percentage	Comment
80% or more	Very high percentage value
70–80%	High percentage value
60–69%	Moderately high percentage value
50–59%	Moderate percentage value
40–49%	Moderately low percentage value



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39% or less	Low percentage value
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(McConnell, 2006, p. 64).

### **3.10.3 Multivariate analysis of Variance (MANOVA)**

MANOVA is used when more than one dependent variable is evaluated. It enables researchers to determine whether changes in the independent variables have significant effects on dependent variables. MANOVA can also be used to measure the level of interaction in both dependent variables and independent variables (Cohen, Manion & Morrison, 2007, p. 145).

### **3.10.4 Confirmatory factor analysis**

Confirmatory factor analysis was used to determine the variables and the extent to which the variables (*location, age, qualification and teaching experience*) contribute to the use of technology to support learning, willingness to use technology to support learning and TPACK.

### **3.10.5 Inspection of group means and independent two-tailed *t*-tests**

Group means and *t*-tests were conducted on Rasch case estimates. These determined whether significant differences existed between the mean ages, qualifications and teaching experiences of EFL teachers. For the *t*-tests, a *p* value of < 0.05 was taken as evidence of a statistically significant difference between group means.

### **3.10.6 Data analysis of the participant interviews**

The interviews were coded, transcribed and analysed as below.

1. Codes were compared to their survey item responses to identify inconsistent responses.
2. Transcripts were coded to identify issues associated with barriers to use technology in teaching.
3. Transcripts were coded to identify common strategies to overcome barriers to use technology in teaching.

Themes were collated, reviewed and discussed.

### **3.11 VALIDITY AND RELIABILITY**

External validity is the degree to which research findings can be generalised to the entire population. Put differently, it is the interaction effect between the treatment and other variables. Internal validity is the approximate truth about the cause-effect relationship. Internal consistency was maintained in this study based on the correlations between different items on the same scale. Therefore, a research design is regarded as internally valid if it identifies a causal relationship accurately. Construct validity means that the research variables are identifiable and can be properly labelled. The research design should allow the specification of the definite cause-effect relationship and the identification of the constructs involved. Content validity addresses whether the used measurement samples the content in the domain of interest as adequately as expected; it is assessed by inspecting the used items for relevance to the construct. A researcher can ensure that the

tool has content validity by using a theory for scale development (Cohen, et al., 2007, p. 136).

Reliability is the extent to which the measures used in the research are internally reliable. It is the degree to which the instrument generates similar results in different trials.

Ensuring the validity and reliability of a research methodology is of primary importance to maintaining the quality of the study. In this research, reliability and validity were maintained. The instrument that was used was the product of a pilot study that showed the instrument's validity and reliability. The instrument covered all of the areas relevant to the construct that it was intended to measure. All of the survey instrument's items were found to be meaningful to the participants. The pilot study involved Rasch analysis to determine construct validity and reliability (Cohen, et al., 2007, p. 139).

### **3.12 CONCLUSION**

This chapter described the methodology for investigating associations between EFL teachers' use of technology, their perception of willingness to use technology and TPACK. The methodology employed was both valid and reliable. The pilot study is presented in the next chapter.

## CHAPTER FOUR

### Pilot Study

This chapter provides details about the pilot study and is divided into five sections. First, the rationale for the pilot study is presented. Second, the pilot study methodology is discussed in detail. Third, the results are presented, and fourth, the pilot study's findings are discussed. Fifth, the achievement purposes of the pilot study are offered. Finally, the implications and how they inform the main study are discussed

#### **4.1 RATIONALE FOR THE PILOT STUDY**

Before undertaking data collection for the main study from all Saudi Arabian technical colleges, it was important to check the logistical feasibility of the methodology as well as the reliability and validity of the data collection process. The pilot study supported these aims.

Two main ideas guided the selection of potential participants for a pilot study. The pilot study should be conducted with a small number of participants who are easily accessible to the researcher (Ghabanchi, 2010; Tuckwiller, Pullen & Coyne, 2010) and who must be members of the population from which respondents for the main study are to be selected (Johanson & Brooks, 2010). The planned main study population was EFL teachers working in all 53 technical colleges in Saudi Arabia; the pilot study targeted four of these colleges. These technical colleges were the largest

colleges (by number of students) in each of the four largest Saudi Arabian provinces (by population).

Conducting a pilot study enabled the researcher to determine whether the intended data collection methodology was acceptable for use in the main study (Benjamins & Whitman, 2010). The pilot study enabled identification of logistical problems, trial analysis of results and preliminary determination of research validity and reliability. Without a pilot study, the research may end up gathering data that is unsuitable for analysis (Johanson & Brooks, 2010).

This pilot study was implemented to achieve five specific purposes. These purposes were as follows:

- to reveal whether the survey items could be understood and respond to effectively by the potential participants. All survey items were developed from scratch, as no item had been adopted or adapted from previous studies. Therefore, testing them was essential;
- to determine the effectiveness of the technical aspects of delivering the survey online;
- to run a trial analysis of the results to check the processing of the data collection and to try to eliminate erroneous results due to data collection problems;

- to check on the validity and reliability of the questionnaire items. Items found to have questionable reliability or validity in the pilot study would be discarded or modified for use in the main study; and,
- to determine teachers' perception of willingness, as it considered important factor affecting EFL teachers' perception of TPACK.

## **4.2 PILOT STUDY METHODOLOGY**

The methodology of the pilot study is presented below in three subsections. The first describes how sampling was performed. The second describes the construction of the survey instrument. The final subsection presents the data analysis.

### **4.2.1 Pilot study participants**

As noted earlier, the pilot study involved EFL teachers working in the largest technical college in each of the four largest provinces in Saudi Arabia. The four colleges (Abha, Jeddah, Riyadh and Tabuk) were chosen to provide a convenient sample of the 53 colleges in the Saudi Arabian TVTC system. Approximately 90 EFL teachers were working at the four technical colleges in July 2010. All participants were more than 23 years old, as this is generally the minimum age at which it is possible to graduate from a Saudi university. A Bachelor's degree is the minimum qualification for an EFL teacher in Saudi Arabia. An increasing number of EFL teachers in Saudi Arabia have Master's

degrees due to a recently-adopted TVTC scholarship program. The EFL teachers invited for the pilot study appropriately represented the population of teachers in the Saudi Arabian technical and vocational education system.

The Dean of each technical college was contacted and asked to give permission by email for college staff to participate in the study. Once approval was received, each Dean's administrative assistant was asked for a list of all currently active EFL teachers. Then, all participants were contacted by email either by the English language supervisor or researcher to obtain their informed consent to participate in the study.

#### **4.2.2 Pilot study survey**

Survey Monkey, an online web-based survey software, was used to gather data from the participants. This method was preferred because manual data collection would have required considerable expense in terms of travel time, and an online survey is more convenient than a paper survey completed by mail because the data are collected in electronic form ready for immediate analysis.

The online survey had 20 items divided into two main categories: demographics (four items) and teachers' willingness to use computers to support students' learning (16 items). The focus of the questionnaire was computer use, as the researcher believed that computers were the most popular form of technology used in the classroom. Computers were essential to the use of other technological devices used by EFL teachers.

### 4.2.3 Demographics

Feyrer (2007) stated that demographic data were relevant to the level of willingness of EFL teachers to use computers to support student learning. Nackerud et al. (2013) stated that demographic data awareness can be important in facilitating teaching process. The demographics category of the survey included four items (see Table 4.1).

Table 4.1  
*Pilot survey demographics Items*

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P1:	Which college do you currently work for?
P2:	How old are you?
P3:	What is the highest qualification in English language teaching you have achieved?
P4:	How many years have you been teaching English?

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Geographical location, age, qualifications and number of years in teaching were considered to potentially be associated with the EFL teacher's level of willingness to use technology to support learning. Item P1 indicated that each college is contributed to simplify the data geographically (Nackerud, et al., 2013). In previous research, the age of teachers has been correlated with use of computers in teaching (Feyrer, 2007). Since Master's of Education or Arts and PhD. qualifications are usually obtained abroad, the level of qualification helps to explain whether a teacher has positive attitudes towards the use of computers in learning. Higher qualifications have been linked to teachers' awareness of the use of computers in the classroom (Ridoutt, Selby Smith, Hummel & Cheang, 2005). The length of participants'



teaching experience is logically an important variable; newer teachers have been shown to use computers more often in classrooms than those who have been teaching for many years (Hayes & Ohrnberger, 2013). In addition, newer teachers were thought more likely to have studied computer subjects during their basic and undergraduate education than teachers who studied when computers were not so prevalent or important.

#### **4.2.4 Willingness to use computers to support student learning**

Willingness items (Table 4.2) were from the same as those used in the main study, with one minor change: the term “technology” was replaced with “computer”, as the term “technology” was defined as referring to computers and all digital technologies at the beginning of the survey. This section of the survey contains 16 items, covering five components that can contribute to teacher’s willingness to use technology in their classroom:

- attitude;
- anxiety;
- self-efficacy;
- motivation; and
- goal-setting.

‘Willingness’ measures the extent to which EFL teachers consider the use of technology in EFL teaching to be an important consideration and is therefore critical to determining the disparity between willingness and use of

technology within the context of the main study. A five-point Likert scale was used for each item: strongly agree, agree, neutral, disagree and strongly disagree. Values ranged from 1 for the highest level of response for an item to 5 for the lowest level of response for an item. The scale order changed from the order that been used in the main study, as Weng and Cheng (2000) indicated that response order had no substantial influence on participant responses and scale characteristics.

Table 4. 2

*Pilot study survey Items: Willingness to use technology to support learning*

Attitude	
P 17:	I believe that students should have access to computer in every classroom.
P 18:	I believe that students enjoy using computer in the classroom.
P 19:	I believe that students will learn more if computer are used in the classroom.
P 20:	I think that using computers in the classroom will make teaching simpler.
Anxiety	
P 21:	I think that using computer to facilitate teaching will be boring for my students.
P 22:	I think that using computer in the classroom will interfere with my teaching.
P 23:	I feel nervous about having to use a computer while teaching.
Self- efficacy	
P 24:	I feel confident learning about new software or tools (e.g., PowerPoint) on the computer.
P 25:	I feel confident when I use computer for teaching in the

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	classroom.
P 26:	I feel confident when assisting my students to use computers in the classroom.
Motivation	
P 27:	I want to use computers in the classroom because it will make my teaching more interesting.
P 28:	I want to use computer in the classroom because it will improve my students' learning.
P 29:	I want to find new and interesting ways of using computer in the classroom.
Goal-setting	
P 30:	I prepare short lesson plans for myself in relation to computer use.
P 31:	I prepare semester length plans that include the use of computer in the classroom.
P 32:	I prepare plans that include new and interesting ways to use computer in the classroom.

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#### 4.2.5 Data analysis

The five-point Likert scale used for responses was given numerical values so that perceptions of willingness could be quantitatively analysed: Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4 and Strongly Agree = 5. A higher total raw score therefore indicated higher perceptions of willingness to use technology to support learning. P9, P10 and P11 were reverse coded as it had negative meaning. Factor analysis was not undertaken due to small number of responses. Quantitative data analysis based on the data gathered from the surveys involved the following techniques.

#### 4.2.5.1 Rasch analysis case estimates

Rasch analysis case estimates were used to determine the relative perception of willingness of individual respondents (Creswell, 2013).

#### 4.2.5.2 Frequency analysis

Frequency analysis was used to provide an overall assessment of the perception of willingness of respondents.

To simplify data analysis, Likert scale responses were categorised according to a system described by Choy (2003). In this system, half of the percentage value of the neutral responses was redistributed to the Strongly Agree and Agree categories and half to the Strongly Disagree and Disagree categories. The resulting percentages were interpreted according to the criteria presented in Table 4.3.

Table 4.3  
*Frequency analysis criteria*

Percentage	Comment
80% or more	Very high percentage value
70–80%	High percentage value
60–69%	Moderately high percentage value
50–59%	Moderate percentage value
40–49%	Moderately low percentage value
39% or less	Low percentage value

(McConnell, 2006, p. 64)

#### **4.2.5.3 Independent two-tailed *t*-tests of group means**

Independent two-tailed *t*-tests of group means were used to determine whether significant differences existed between the ages, qualifications and teaching experiences of EFL teachers in the four colleges. Group means and *t*-tests were conducted on Rasch case estimates. For the *t*-tests, a *p* value < 0.05 was taken as evidence of a statistically significant difference between the various group means.

### **4.3 PILOT STUDY RESULTS**

This section presents the results of the pilot study, beginning with response rates by technical college. The validity and reliability of the survey instrument are reported. Lastly, the factors affecting willingness were identified by inspecting group means and applying *t*-tests.

#### **4.3.1 Survey respondents**

This section provides background information about the survey and respondents. In particular, survey response rate, age, qualifications and teaching experience of respondents.

The survey was undertaken by 33 respondents. Two participants who did not respond to any survey items were removed from the data, leaving a total of 31 respondents. A breakdown of response rates by college is presented in Table 4.4.

Table 4.4  
*Response rates by college*

College	Staff Number (n)	Respondents (n)
Abha Technical College	22	11
Dammam Technical College	25	3
Jeddah Technical College	31	9
Tabuk Technical College	16	9

Table 4.4 shows that the highest response rate was from Abha Technical College, where half the EFL teachers participated in the survey. Dammam Technical College had the lowest response rate.

*Age of respondents:* A breakdown of response rates by age is presented in Table 4.5.

Table 4.5  
*Response Rate by Age*

Age (year)	Survey Respondents (n)
25 or younger	1
26-35	16
36-45	14
46 or over	0
Total	31

Most of the respondents were under 35 years of age. There were no respondents over 46 years of age.

*Qualifications:* The highest qualifications of the respondents are summarised in Table 4.6.

Table 4.6  
*Qualifications of respondents*

Qualification	Survey Respondents (n)
Bachelor's of Arts	1
Bachelor's of Education	12
Master's	16
PhD	2

All the participants surveyed had university qualifications, as teachers were required to have a university qualification to teach. The most common highest qualification among the participants was a Master's degree. Two respondents had PhD qualifications.

*Teaching experience:* The teaching experience of the respondents is given in Table 4.7.

Table 4.7  
*Teaching experiences of respondents*

Teaching Experience (years)	Survey Respondents (n)
1-5 years	2
6-10 years	15
11-15 years	10
16 or more	4
Total	31

Fifteen of the EFL teachers surveyed had between 6 and 10 years' experience in teaching. Four respondents had teaching experience of 16 or more years. Thus, the respondents could be considered experienced teachers.

#### 4.3.2 Survey instrument

As discussed in the pilot study methodology (section 4.2.5.1), the Rasch model was based upon the construct of unidimensionality. Items that are shown to fit the Rasch model may be considered as measuring a single underlying construct. Rasch analysis was applied to the willingness data sets to determine their degree of fit to the Rasch model. Table 4.8 presents the relevant fit statistics for willingness data sets.

Table 4.8  
*Survey instrument fit statistics*

Criteria	Statistic	Acceptable Values
Willingness Item Summary		
Infit (mean squared)	0.98	0.6 to 1.4
Infit <i>t</i>	-0.1	-2 to +2
Outfit (mean squared)	1.14	0.6 to 1.4
Outfit <i>t</i>	0.20	-2 to +2
Item reliability	0.75	> 0.7

Fit statistics for the willingness data sets fall within acceptable limits, suggesting that data sets were unidimensional. In practical terms, this meant that the willingness survey items were measuring a single underlying construct.



### 4.3.3 Validating the instrument: Survey responses

The instrument was therefore appropriate for the use in Saudi Arabia based on 31 responses. Table 4.9 presents the percentages of respondents who agreed and disagreed with the willingness items.

Table 4.9  
*Survey responses - Willingness*

Category	Question	Agree
Attitude	1. I believe that students should have access to computers in every classroom.	89%
	2. I believe that students enjoy using computers in the classroom.	100%
	3. I believe that students will learn more if computers are used in the classroom.	98%
	4. I think that using computers in the classroom will make teaching simpler.	91%
Anxiety	5. I think that using computers to facilitate teaching will be boring for my students.	5%
	6. I think that using computers in the classroom will interfere with my teaching.	13%
	7. I feel nervous about having to use a computer while teaching.	18%
Self-Efficacy	8. I feel confident learning about new software or tools (e.g., PowerPoint) on the computer.	94%
	9. I feel confident when I use computers for teaching in the classroom.	97%
	10. I feel confident when assisting my students to use computers in the classroom.	97%
Motivation	11. I want to use computers in the classroom because it will make my teaching	95%

Category	Question	Agree
	more interesting.	
	12. I want to use computers in the classroom because it will improve my students' learning.	98%
	13. I want to find new and interesting ways of using computers in the classroom.	97%
	14. I prepare short lesson plans for myself in relation to computer use.	53%
Goal Setting	15. I prepare semester length plans that include the use of computers in the classroom.	52%
	16. I prepare plans that include new and interesting ways to use computers in the classroom.	52%

All 31 responding EFL teachers believed that students enjoyed using computers in the classroom. In the goal-setting component, EFL teachers surveyed appeared inconsistent with lesson plans in both the short and long term.

#### **4.3.4 Factors affecting willingness**

This section presents the group mean and *t*-test results for the willingness data.

*Inspection of group means:* Group means of respondents were calculated from Rasch Analysis case estimates across three variables: age, qualification and teaching experience for willingness. Differences existed between mean

responses according to the respondents' age and qualifications but not teaching experience (see Table 4.10).

Table 4.10  
*Group means – Willingness*

Variable	N	Mean
<i>Age</i>		
35 or younger	17	1.69
36 and older	14	0.83
<i>Qualifications</i>		
Bachelor's Degree	13	0.64
Higher Degree (Master's or PhD)	18	1.77
<i>Teaching Experience</i>		
10 years or less	17	1.28
11 years or more	14	1.32

*t*-tests: Two-tailed independent *t*-tests were used to determine whether any of the differences in the group means were statistically significant (see Table 4.11)

Table 4.11  
*Independent t-tests results – Willingness*

Variable	t value	Significance ( $p < .05$ )
Age	1.509	0.142
Qualifications	-2.32	0.03
Teaching experience	-0.54	0.958

A statistically significant difference existed in mean willingness between respondents with different levels of qualifications. Teachers who

have master's degrees were more willing than those who have bachelor's degrees. There were no statistically significant differences between respondents of different ages and levels of teaching experience.

#### **4.4 PILOT STUDY DISCUSSION**

This section presents discussion of pilot study results. It has three sections in order to answer the pilot study research questions. A general overview about the survey instrument was conducted then a discussion about the perception of EFL teacher's willingness to use technology to support student learning. Finally, the section presents the most important factors that affect teachers' willingness to use technology to support student learning.

##### **4.4.1 Pilot study survey instrument**

The survey instrument was well received by nearly all the respondents. Two of the respondents did not answer any of the items. The response rate was satisfactory ( $n = 31$ ). The pilot study of Ghabanchi (2010) received a similar response rate. Johanson and Brooks (2010) indicated that this response rate was satisfactory for a pilot study. Significantly, the EFL teachers at Abha Technical College who received the introductory email to participate in the study through their English language supervisor had a response rate higher than expected (Table 4.4). The survey might have appeared to the respondents as an official work duty, and so the survey might have been completed to satisfy their supervisor.

Rasch case and item estimates (see Table 4.8) indicated that the survey instrument was both valid and reliable based on 31 responses. As the data could be fitted to the Rasch model, the measurements of willingness were unidimensional (Teo & Waugh, 2010). In other words, each represented a single construct. These results could be expected to be repeated if the survey was given to a similar sample (Trevor & Christine, 2007).

#### **4.4.2 Teachers' willingness**

Discussion in this section addresses the research question: To what extent are EFL teachers in Saudi Arabian technical colleges willing to use computers to support the learning of English?

The construct of willingness was measured under the subcategories of attitude, anxiety, self-efficacy, motivation and goal-setting. The results under each of these subcategories are discussed in detail in the following paragraphs, leading to formulation of current willingness among EFL teachers in Saudi Arabian Technical Colleges.

As shown in Table 4.9, large majorities of respondents reported positive attitudes towards technology use in class. They were unanimous in saying that students enjoyed using technology in the classroom and almost unanimous (98%) that students would learn more if technology were used in the classroom setting. However, 11% of the respondents did not agree that students should have access to computers in the classroom. Perhaps the respondents may have thought the use of technology as being impractical

and unnecessary. It appears that these results support the findings of research conducted by Abbitt (2007). Nevertheless, a strong majority of the respondents (89%) believed that students should have the use of technology in class, further establishing the strength of the attitude element of willingness.

Respondents showed very minimal anxiety towards technology use in class. Over 90% believed that using technology in the classroom would simplify teaching, and that doing so would not make the class boring for students. However, 13% of the respondents felt that using technology in the classroom would interfere with their teaching practices, and 18% claimed that they felt nervous about the use of computers in class. These statements reflect the work of Albirini (2006) who discussed how the enthusiasm of teachers towards the possible benefits of technology in class were usually tempered by their anxieties over whether their current teaching methods would still be applicable or effective in a technology- enriched setting. Thus, it can be hypothesised from these results that while teachers may express willingness to make use of technology, they set limitations to their willingness based on how anxious they feel about their ability to adapt.

The anxiety barrier identified in the survey could be moderated by the self-efficacy element. Almost all of the respondents reported that they were confident learning about new software or tools of the technology, about using technology for teaching in the classroom, and about assisting their students to use technology in the classroom. Compeau and Higgins (1995)

explained that self-efficacy plays a critical role in helping individuals face anxieties regarding the use of unfamiliar technology or using familiar technology in unfamiliar ways. Thus, the high level of self-efficacy reported by respondents indicates that while anxieties are present, EFL teachers in Saudi Arabian technical colleges are confident that they can overcome their anxieties and lead students to better learning experiences with the use of technology. The same inference can be made from the results on the level of teacher motivation. It was high across all three questions under the self-efficacy category. Based on explanations given by Ofoegbu (2004), the high levels of motivation exhibited by the teachers through their responses indicates that they were very open to the use of technology to improve the operations of the contemporary classroom, especially in terms of using technology to support student learning.

Goal-setting was the category of willingness that showed the largest differences between teachers' attitude and anxiety in responses. Approximately half the respondents reported preparing short lesson plans in relation to technology use, and half did not; similarly, about half reported preparing semester length plans that included the use of technology in the classroom, and half reported preparing plans that included new and interesting ways to use technology in the classroom. This result suggests that while teachers seemed united in their willingness to see technology implemented in classrooms, many have difficulty in putting this willingness into action. There are several possible explanations for this finding. One may



be that teacher' responses about preparing short- and long-term plans reflected their attitude not just towards technology but towards the preparation of lesson plans and semester length plans in general. Another possible explanation, one that is supported by previous studies (See, Alshumaimeri, 2008; Kessler, 2010; Milbrath & Mable, 2000), is lack of support from the respondents' respective institutions in the form of sufficient opportunities, encouragement and facilities for making lesson- and semester-length plans aligned with computer use.

The results generally showed that while the respondents were willing to make use of technology in the classroom, approximately half had yet to show their willingness through concrete action. This finding, according to Albirini (2006) and Jawahar (2001), is a significant manifestation of willingness.

#### **4.4.3 Factors affecting willingness**

Teachers with different qualifications had significantly different perceptions of willingness (Table 4.10). Respondents who possessed a Master's or Doctoral degree were significantly more willing to make use of computers to enhance student learning in EFL classrooms than teachers with Bachelor's degrees ( $p < .05$ ). No other variables (age or teaching experience) were significantly associated with willingness. This result may be at least partially explained by the fact that those teachers in Saudi Arabian technical colleges who possess higher degrees would have obtained them from Western institutions where they would have had relatively greater exposure

to technology. This conjecture is supported by similar findings by Boulton (2009) and Bingham and Larson (2006). Furthermore, teachers with higher educational qualifications were likely to have made more extensive use of technologies in their studies and research. As technology is a very popular topic in contemporary education research, it is likely that many of these teachers with higher degrees would have become substantial familiar with it, and thereby had more opportunities to develop significantly higher willingness to use these technologies in their teaching than those with only a Bachelor's degree. This hypothesis is supported by Jian et al. (2009), Bayram and Seels (1997) and Holmes (1998), who affirmed that prior experience with technology – or in the study of Jian et al. (2009) with gadgets that can be used for technology – increased the likelihood of positive attitudes towards it. Thus, these results suggest that requiring teachers to finish advanced degrees may mean they gain increased exposure to technology and greater willingness to apply it in their teaching.

#### **4.5 PILOT STUDY OUTCOMES**

The pilot study was successful in achieving its five goals. Each of the five goals had to be achieved to determine if any alterations would need to be made to the instruments used in the main study and to ensure its success.

Pilot study results demonstrated that most participants were able to understand the wording of the study (goal 1). Understanding the expressions was demonstrated by the fact that 31 of participants successfully completed

the online survey. The ability for participants to understand and complete the survey was important, as the willingness items used in the pilot survey were completely new – the researcher developed them from scratch. It should also be noted that none of the participants contacted the researcher to discuss any aspects of the study. This further demonstrated that the survey items were easy for the sample population to understand and access through the hosting website. Based on these factors, it can be stated that the participants experienced no difficulty in comprehending and completing the pilot survey.

The pilot survey allowed the researcher to assess the effectiveness of delivering the survey online (goal 2). All participants completed the survey in full, demonstrating that potential participants were able to access the study through the hosting website. The pilot study further helped to identify factors such as the website ability to write in different scripts and the hosting that might impact the results of the study. As a result of the pilot, the researcher decided to move the survey to another website hosting company that supports Arabic translation. Changing the website hosting was intended to further increase the ease of using the survey, as participants would be able to read the survey in their native language. The researcher expected that this change might help other Saudi EFL teachers who may not have a high level of English comprehension to understand the survey items. Providing a translation was also intended to increase the study's generalisability, as

participants might otherwise not have been able to understand new terminology to complete the survey.

The pilot results indicated that many of the participants with higher levels of qualification were more likely to be willing to incorporate technology into their classroom teaching (goal 3), a finding supported by previous research (Bozalek et al., 2013). The consistency in responses amongst participants with higher levels of qualification suggests that this survey reliably measured the participants' views. Based on this finding, the pilot showed that the data collection process and the analysis methods were sound and appropriate.

The findings from the pilot study echoed those of other researchers (De, et al., 2010) in terms of participants' age. Recurring different research finding is an important outcome, as reliability is a core component for any research study (goal 4). In addition, the validity of this study was demonstrated by the fact that participants clearly understood the pilot survey. However, the researcher decided that it was necessary to replace the term 'computers' with 'technology' in order to ensure that the participants understood that technology was not limited only to computers. Although it was unknown whether EFL teachers in Saudi Arabia used technology other than computers in the classroom, it was decided to use the term 'technology' to ensure a consistent understanding that the term included all kinds of technology – including computers – that teachers may use.

Finally, the participants' willingness to use technology to support learning was determined to be heavily based on their educational attainment (goal 5). The pilot results demonstrated that participants with high qualifications (Master's or Doctoral degree) were more likely to be willing to incorporate computers into the classroom than teachers who had only a Bachelor's degree. No other variables had an impact on the participants' willingness to use computers in the classroom. As previously discussed, EFL teachers' higher qualifications may increase their likelihood of exposure to technology in the classroom. However, the researcher further hypothesised that the location such Western country in which the teachers received their qualifications could play a role in the teacher's perspective towards technology use. Thus, the teacher's perspective on incorporating technology in the classroom could be significantly associated with both qualifications and location.

#### **4.6 IMPLICATIONS FOR THE MAIN STUDY**

Although the pilot study was successful, it revealed that a number of revisions were needed in order to increase the main study's validity. As mentioned earlier, one of the main changes involved was providing translations of the survey items into Arabic. Despite all indications being that the participants had no trouble comprehending the survey, the previous lack of translation may have meant a subset of participants did not fully understand the meaning of some terminology and acronyms.

Second, as briefly described in the previous section, the researcher decided it would be best to replace the term 'computer' with 'technology'. Technology is a term that incorporates various forms of devices in addition to computers. Therefore, it was important to clarify to the participants that the study would focus primarily on digital technologies. These changes (improvements) might help to increase the study's validity. This is important because validity helps to make the main study function more systematically by ensuring participants understand the questions asked (Montecinos, Rittershausen, Cristina Solís, Contreras & Contreras, 2010). Furthermore, this reduces the likelihood that participants will misunderstand the question.

Another improvement was reversing the order of the Likert scale for all questions. In the pilot study, Likert scale order was: strongly disagree, disagree, neutral, agree, and strongly agree. The researcher decided that it would be better to begin the scale on a positive note. Therefore, the order of the scale was amended to put positive answers first: strongly agree, agree, neutral, disagree, and strongly disagree. Although this was a minor change, the researcher believed that it might alter the way participants responded to the online survey.

The hosting website for the online survey was changed following the pilot. Survey Monkey was used for the pilot study, but for the main study, the researcher decided to use Qualtric survey software. Although both are useful, Qualtrics allowed the researcher to translate the survey items into Arabic scripts.

For the main study, the researcher believed that mixed data collection methods should be used. The pilot study did not incorporate an interview process designed to improve the online survey responses. The addition of an interview was intended to provide deeper understanding of factors that could affect the participant's perceptions.

The final improvement was to find a convenient way to contact all EFL teachers at once. For the pilot study, deans of the mentioned four technical colleges acted as middlemen between the researcher and participants. However, the large number of technical colleges ( $n = 34$ ) involved in the main study made it logistically difficult to contact each dean independently. Furthermore, there was no guarantee that the deans (all very busy people) would provide information to potential participants as requested. Therefore, it was decided that a better approach was to contact the supervision department at TVTC to reach all potential participants.

#### **4.7 CONCLUSION**

The main goal of the pilot study was to check the logistical feasibility of the methodology as well as the reliability and validity of the data collection process. The results of the pilot study were of critical importance to further improvement of EFL teacher training and the development of technology-assisted language learning. The pilot study established that EFL teachers in the four chosen technical colleges were generally willing to

competently handle technology-assisted learning environments in teaching EFL.

The pilot study was necessary to prepare for a larger and more representative survey of EFL teachers working in Saudi Arabia. A trial run of the methodology's components, from the data gathering instrument to its analysis tools, was critical to ensure that the main study was free from preventable errors and problems that could affect the overall quality of the research. By conducting the pilot study, the researcher was able to evaluate the reliability and validity of the survey instrument and ensure that the actual data gathering and analysis phases would run smoothly. The positive outcomes of the pilot study meant that the trialled methodology was appropriate for the main study.

The results of the application of the methodology are presented in the next chapter.



## CHAPTER FIVE

### Results

This chapter examines EFL teachers' perceptions of technology use to support learning, their willingness to engage in such activities, and their associated TPACK perception. It is divided into three sections. The first section provides the online survey results. The second section presents and analyses the results to the research questions are presented. The third section provides the results and analysis from the individual interviews.

#### **5.1 ONLINE SURVEY**

This section provides the response rate and results of the online survey relating to demographics, the use of technology to support learning, willingness to use technology to support learning and TPACK.

##### **5.1.1 Online survey response rate**

Ninety-three of 373 EFL teachers known to be teaching English in TVTC indicated they would take part in the online survey. This represented a response rate of 24.9%. For an online survey, this response rate is considered sufficient (Cooksey, 2007; Dillman, 2009).

##### **5.1.2 Demographics**

Four items in the online survey were designed to collect information on participants' demographics: employment location, age, qualifications and teaching experience. The results of these four items are presented next.

### 5.1.2.1 Colleges attended by the participants

The colleges where the survey participants taught are listed in Table 5.1.

Participants from 31 of the 34 technical colleges in Saudi Arabia were represented in the online survey. Jeddah Technical College has the largest number of participants ( $n = 8$ ). There were no participants from three technical colleges ( $n = 0$ ).

Table 5.1  
*Colleges of participants*

College	Frequency
Abha College of Technology	6
Ahsa College of Technology	3
Al-Rass College of Technology	2
Baha College of Technology	2
Bisha College of Technology	1
Buraidah College of Technology	2
Dammam College of Technology	1
Dwadmi College Of Technology	2
Food and Environment College in Buraidah	2
Hafr Al-Batin College of Technology	2
Hail College of Technology	5
Jazan College of Technology	4
Jeddah College of Technology	9
Jeddah College of Telecom and Electronics	0
Jouf College of Technology	2
Khamis Mushait College of Technology	5
Kharj College of Technology	3
Madinah College of Technology	3

Madinah College of Tourism and Hospitality	0
Majmaah College of Technology	3
Makkah College of Technology	5
Najran College of Technology	2
Qatif College of Technology	4
Qunfudah College of Technology	3
Qurayyat College of Technology	1
Quwaiya College of Technology	1
Riyadh College Of Technology	5
Riyadh College of Telecom and Information	3
Tabuk College of Technology	2
Taif College of Technology	0
Unaizah College of Technology	4
Wadi Addawasir College of Technology	2
Yanbu College of Technology	2
Zulfi College of Technology	2
Total	93

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#### **5.1.2.2 Age of the participants**

The age of the survey participants is presented in Table 5.2. All age ranges were represented in the survey sample. The 26–35 and 36–45 age ranges were represented most commonly among participants in the online survey (n = 44+37). The 46 or older age range was represented the least (n = 3). It is clear that most of participants were below middle age.

Table 5.2  
*Ages of the participants*

Age range	Frequency
25 or younger	9
26–35	44
36–45	37
46 or older	3
Total	93

### 5.1.2.3 Qualifications

The distribution of the qualifications of the online survey participants is presented in Table 5.3. The most common level of qualification was a Master's degree ( $n = 46$ ). This reflects the Saudi government's policy for Technical College teachers to be sent overseas to gain higher qualifications. The least common degree was a PhD ( $n = 3$ ). Staff from technical colleges do not normally receive governmental support for obtaining PhD qualifications.

Table 5.3  
*Qualifications of the participants*

Qualification	Frequency
Bachelor's (Arts)	4
Bachelor's (Education)	40
Master's	46
PhD	3
Total	93

#### 5.1.2.4 Teaching experience

The distribution of teaching experience of the participants is given in Table 5.4. Most of the teachers surveyed had 11–15 years of teaching experience ( $n = 38$ ). Many teachers surveyed had 6–10 years' experience with teaching ( $n = 31$ ), but eleven participants had five years or less ( $n = 11$ ). Thus, the respondents could be considered relatively experienced teachers (Perez, Nie, Ardern, Radhu & Ritvo, 2013).

Table 5.4  
*Teaching experience*

Year range	Frequency
1–5	13
6–10	31
11–15	38
16 or more	11
Total	93

#### 5.1.2.5 Summary

The response rate for the online survey was considered to be adequate. The demographics data indicated important independent factors. The participants' location was the less important independent factor, as three technical colleges produced no participants. The age range indicated statistically significant differences. Younger teachers appeared to be the most likely to participate in the online survey. All participants had university qualifications, many at Master's level or higher. The majority of participants had adequate teaching experience. Thus, the

sample was considered sufficiently representative of EFL teachers at Saudi Arabian Technical Colleges.

### **5.1.3 Factor Analysis**

Factor analysis is a statistical approach that assumes no unique or error variance and is concerned with establishing which linear components exist within the data and how a particular variable might contribute to the EFL teachers' use of technology, willingness and the perception of TPACK (Ramakrishnan & Ravindran, 2012). Varimax orthogonal rotation was employed in order to produce factor solutions because it simplifies the interpretation of factors and attempts to maximize the dispersion of loadings within factors.

Ramakrishnan and Ravindran (2012) stated that factor analysis is a data reduction method that can reduce a large set of variables to a more meaningful smaller set of variables. Factor analysis with varimax was adopted to check the unidimensionality among items because each variable was measured by multi-item constructs. The researcher conducted two types of principal component analyses. In the first case, the factors were extracted naturally to show how the variables loaded to each factor regardless of the existing literature. In that case, an explanatory factor analysis was conducted; specific factors were extracted according to the particular data set. In the second case, factors were extracted according to how certain variables described each construct. In this case, factors were extracted according to how respondents perceived certain constructs.

A factor loading of  $> 0.4$  was considered to be an indication of a significant relationship between variables. Factor loadings for the online survey components are presented in Table 5.5. All construct items with factor loadings of more than 0.4 were considered suitable for further analysis; this meant that none of the factors were omitted from analysis.

Table 5.5  
*Factor loading*

Items	1	2	3	4	5	6	7
Create and edit text (e.g., Word).		0.52					
Create presentations (e.g., PowerPoint).		0.41	0.71				
Create graphics (e.g., Paint).			0.40		0.49		
Communicate by text (e.g., chat, email).						0.76	
Communicate with visuals (e.g., Skype, videoconference).		0.40	0.42			0.60	
Access the Internet to gather and have information.	0.56						
Access online tools (e.g., dictionary, translator, thesaurus)	0.64						
Demonstrate educational software (e.g., CD-ROM, learning objects.						0.54	
Map concepts (e.g., Kidspiration, Inspiration).					0.83		
Develop web pages (e.g., FrontPage).					0.90		
Develop multimedia (e.g., HyperStudio).					0.90		
Engage in virtual worlds, simulations (e.g., Second Life).					0.84		

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I believe that students should have access to technology in every classroom	0.44	
I believe that students enjoy using technology in the classroom		0.78
I believe that students will learn more if technologies are used in the classroom	0.45	0.64
I think that using technologies in the classroom will make teaching simpler.		0.48
I think that using technology to facilitate teaching will be boring for my students.		0.73
I think that using technology in the classroom will interfere with my teaching.		0.68
I feel nervous about having to use a technology while teaching.		0.53
I feel confident learning about new software or tools (e.g., PowerPoint) on the computer.	0.75	
I feel confident when I use technology for teaching in the classroom.	0.86	
I feel confident when assisting my students to use computers in the classroom.	0.84	
I want to use technologies in the classroom because it will make my teaching more interesting.	0.78	
I want to use technology in the classroom because it will improve my students' Learning.	0.79	
I want to find new and interesting ways of using technology in the classroom.	0.68	

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I prepare short lesson plans for myself in relation to technology use.	0.55		
I prepare semester length plans that include the use of technology in the classroom.	0.62		
I prepare plans that include new and interesting ways to use technology in the classroom.	0.59		
I know how to solve my own technical problems.	0.78		
I have the technical skills I need to use technology.	0.90		
I can learn technology easily.	0.66		
I know about a lot of different technologies.	0.86		
I use a variety of software (Word, PowerPoint, Photoshop, etc.) preparing for lesson plans.	0.62	0.59	
I use a variety of software (PowerPoint, Flash, Word, etc.) when presenting lessons.	0.43	0.60	
I use a variety of software (Word, PowerPoint, etc.) when evaluating students.	0.61		
I can choose technologies that enhance teaching process.	0.52	0.43	
I know about technologies that I can use for understanding and doing English language.	0.66		
I look for online resources when selecting materials to use for my English language class.	0.42		0.52
I can communicate orally in English using technology (e.g., Skype, chat rooms Viber and Tango).	0.49		0.52

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I view videos on the Internet that are in the English language.	0.63		
I have the ability to use technology in English language teaching.	0.68		
I make my classes interesting and stimulating by using technology in English language teaching.	0.62		
I can explain how the use of computers can help students to learn the English language.	0.40		
I believe that it is important to make use of technology in teaching EFL.	0.82		
I have sufficient knowledge about English language.	0.58		
I have had extensive experience practicing English language in Western society.			
I can develop an English language course.	0.63		
I have various strategies of developing my English language (e.g., reading and watching).		0.66	
I know how to assess student performance in the classroom.	0.40	0.55	
I consider myself to be an experienced teacher with sufficient years of experience in pedagogy.		0.81	
I know how to organise and maintain classroom management.		0.70	
I can adapt my teaching style to different learners.		0.58	
I use diverse teaching strategies in facilitating the instruction of EFL.	0.40	0.57	

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I give tests in English as a foreign language subjects that address both lower- and higher-order think.	0.59	
I implement teaching methods to help slow learners in my EFL class.	0.57	
I can select effective teaching strategies to guide students in EFL.	0.65	0.42

Exploratory analysis used to find out how many factors in the data.

Exploratory analysis shows that 14 factors were found. Some of the factors have one item. Items that loaded more than one scale were deleted. Factors that had fewer than three items were eliminated.

Scree test was used to determine which factors should be retained (Williams, Brown & Onsman, 2010). Scree shows that the factors should be between six to eight factors (Figure 4).

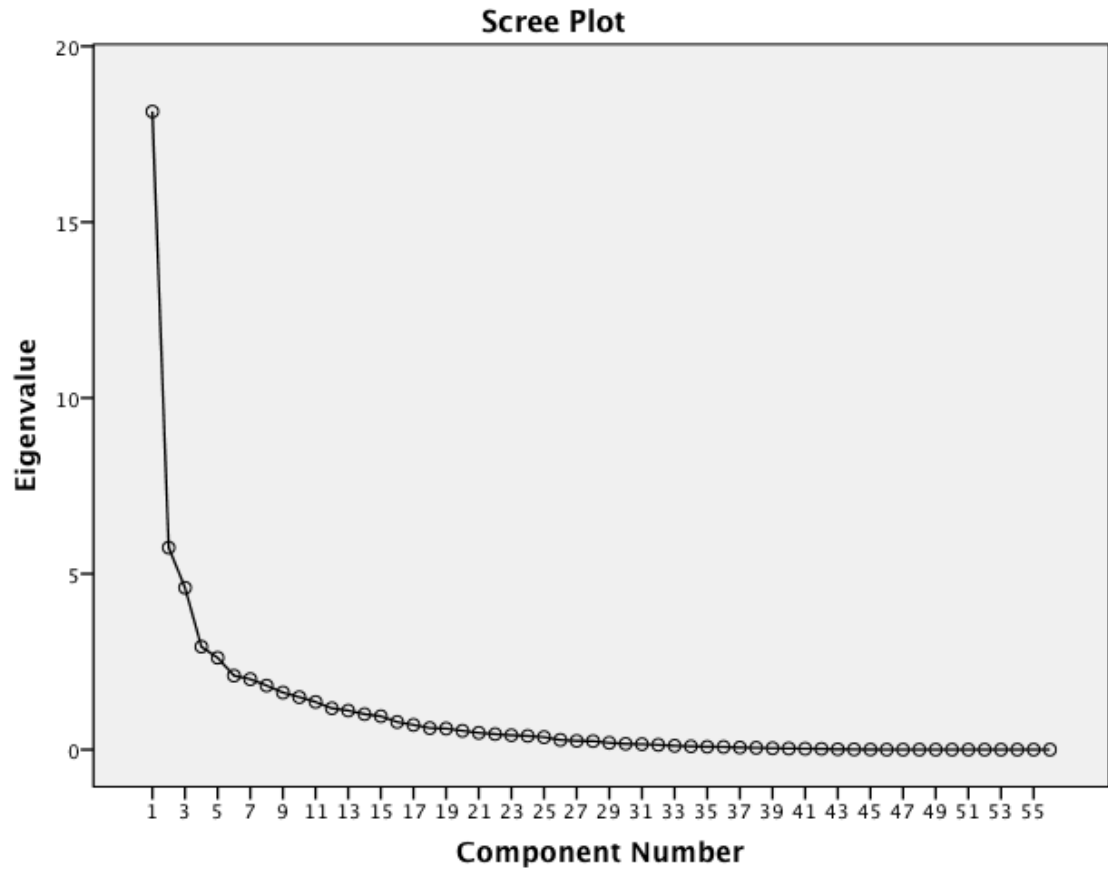


Figure 4: Factor solution

Confirmatory analysis was used to determine the accurate factor. There were seven factors identified in the data. The seven factors are listed below:

- 1) use of technology;
- 2) technology and pedagogy knowledge;
- 3) enjoyment;
- 4) teaching strategies;
- 5) use of software;
- 6) communication; and

7) technology that assists learning.

The seven factors do not align with factors identified in the TPACK structure. The result is significant as no other research indicated similar results.

#### **5.1.3.1 Factors' reliability, KMO and BTS**

Factor analysis indicated seven factors affecting EFL teachers' perceptions towards technology use in the classroom. The reliability measures for the online survey items were in an acceptable range. Seven factors explained 67.54% of variance. All the construct items were suitable for further analysis. Reliability of the online survey scales is presented in Table 5.6.

Table 5.6

*Factors' means, standard deviation, mean correlation and reliability*

Scale	Means	SD	MC	Reliability
Use of technology	1.31	0.46	0.36	0.90
Technology and pedagogy knowledge	1.50	0.54	0.47	0.92
Enjoyment	1.60	0.62	0.45	0.87
Teaching strategies	1.80	0.54	0.36	0.85
Use of software	3.70	1.35	0.12	0.95
Communication	1.80	0.76	0.49	0.78
Technology that assists learning	1.50	0.77	0.37	0.80

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was evidence used to examine the appropriateness of the factor analysis. High values (between 0.5 and 1.0) indicate that the factor analysis was appropriate (Cooksey, 2007; Streiner, 2013).

Bartlett's test of sphericity (BTS) was used to examine the premise that the variables were uncorrelated. Sample of the study correlation matrix is an identity matrix. Values for the KMO measure of sampling adequacy and BTS were calculated to determine the appropriateness of the sample for factor analysis. KMO and Bartlett's test were applied to test the factors created from the online survey items. The results are presented in Table 5.7.

Table 5.7  
KMO and Bartlett's Test

Scale	KMO	BTS
Use of technology	0.82	420.95
Technology and pedagogy knowledge	0.85	500.28
Enjoyment	0.85	324.48
Teaching strategies	0.79	255.94
Use of software	0.85	284.90
Communication	0.76	127.48
Technology that assists learning	0.75	106.71
All Scales	0.83	110.25

\*\*\*  $p < 0.001$

Table 5.6 shows that the sampling adequacy measure for the seven scales was 0.83 and correlation was in an acceptable range. The BTS result was 110.25 and significant, indicating sufficient connection between the constructs.

#### 5.1.3.1 Use of technology

The reliability value for the use of technology factor was 0.90 (Table 5.6) and therefore acceptable. Values for KMO (0.82) and BTS ( $p < .05$ ) were in the acceptable range (Table 5.7), meaning the data were suitable for factor analysis. All the constructs of use of technology items had factor loadings of more than 0.4 and were suitable for further analysis (Cooksey, 2007; Voon, Ngui & Agrawal, 2011). None of the items were deleted from analysis.

#### **5.1.3.2 Technology and pedagogy knowledge**

As shown in Table 5.6, the reliability of the sampling adequacy measure for technology and pedagogy factor was 0.92 and thus in an acceptable range. Values for KMO (0.85) and BTS ( $p < .05$ ) were in the acceptable range (Table 5.7), meaning the data were suitable for factor analysis.

All the constructs of technology and pedagogy items had factor loadings of more than 0.4 and were thus suitable for further analysis. None of the items were deleted from analysis.

#### **5.1.3.3 Enjoyment**

The reliability of the sampling adequacy measure for enjoyment factor was 0.92 (Table 5.6) and thus in an acceptable range. Values for KMO (0.85) and BTS ( $p < .05$ ) were in the acceptable range (Table 5.7), meaning the data were suitable for factor analysis.

All the constructs of enjoyment items had factor loadings of more than 0.4 and were thus suitable for further analysis. None of the items were deleted from analysis.

#### **5.1.3.4 Teaching strategies**

As shown in Table 5.6, the reliability of the sampling adequacy measure for teaching strategies factor was 0.95 and was thus in an acceptable range. Values for KMO (0.79) and BTS ( $p < .05$ ) were in the acceptable range (Table 5.7), meaning the data were suitable for factor analysis.



All the constructs of teaching strategies items had factor loadings of more than 0.4 and were thus suitable for further analysis. None of the items were deleted from analysis.

#### **5.1.3.5 Use of software**

Table 5.6 shows that the reliability of the sampling adequacy measure for use of software factor was 0.92 and thus in an acceptable range. Values for KMO (0.85) and BTS ( $p < .05$ ) were in the acceptable range (Table 5.7), meaning the data were suitable for factor analysis.

All the constructs of technology and pedagogy items had factor loadings of more than 0.4 and were thus suitable for further analysis. None of the items were deleted from analysis.

#### **5.1.3.6 Communication**

The reliability of the sampling adequacy measure for communication factor was 0.78 (Table 5.6) and was thus in an acceptable range. Values for KMO (0.76) and BTS ( $p < .05$ ) were in the acceptable range, meaning the data were suitable for factor analysis.

All the constructs of communication items had factor loadings of more than 0.4 and were thus suitable for further analysis. None of the items were deleted from analysis.

#### **5.1.3.7 Technology that assists learning**

As shown in Table 5.6, the reliability of the sampling adequacy measure for technology that assists learning factor was 0.80 and was thus in an acceptable range. Values for KMO (0.75) and BTS ( $p < .05$ ) were in the acceptable range (Table 5.7), meaning the data were suitable for factor analysis.

All the constructs of technology that assists learning items had factor loadings of more than 0.4 and were thus suitable for further analysis. None of the items were deleted from analysis.

#### **5.1.4 Factors' means and standard deviation**

The online survey contained 56 items designed to collect information on participants' use of technology, willingness and TPACK. To determine whether any statistically significant differences could be identified between the survey factors, means and standard deviation were calculated for each of the seven indicated factors (see Table 5.8).

Descriptive statistics for survey components are presented in Table 5.8. It shows that the mean value of use of technology factor among the participants was 1.31 with a standard deviation of 0.46 and range between 1.00 and 2.73. Technology and pedagogy knowledge factor was 1.50 with a standard deviation of 0.54 and range between 1.00 and 3.81. Enjoyment factor was 1.60 with a standard deviation of 0.62 and range between 1.00 and 4.13. Teaching strategies factor was 1.80, with a standard deviation of 0.54 and range between 1.00 and 3.11. Use of software factor was 3.70 with a standard deviation of 1.35 and range between 1.00 and 5.00.

Communication factor was 1.80 with a standard deviation of 0.76 and range between 1.00 and 3.80. Technology that assists learning factor was 1.50 with a standard deviation of 0.77 and range between 1.00 and 4.00.

Table 5.8  
*Descriptive Statistics*

Scale	Means	SD	Minimum	Maximum
Use of technology	1.31	0.46	1.00	2.73
Technology and pedagogy knowledge	1.50	0.54	1.00	3.18
Enjoyment	1.60	0.62	1.00	4.13
Teaching strategies	1.80	0.54	1.00	3.11
Use of software	3.70	1.35	1.00	5.00
Communication	1.80	0.76	1.00	3.80
Technology that assists learning	1.50	0.77	1.00	4.00

#### **5.1.4.1 Use of technology**

Results indicated that EFL teachers made sufficient use of technology. Eleven items in the online survey constructed the use of technology factor in order to support learning in the classrooms. The mean value of use of technology factor among the participants was 1.31 with a standard deviation of 0.46, which was positive and significant. This results means that teachers felt that they used technology appropriately. The means and standard deviations of the responses to these 11 items are presented in Table 5.9.

Table 5.9  
*Factor 1: Use of technology*

Items	Mean	SD
Access the Internet to gather and have information.	1.25	0.54
Access online tools (e.g., dictionary, translator, thesaurus).	1.32	0.56
I believe that students should have access to technology in every classroom.	1.15	0.66
I feel confident learning about new software or tools (e.g., PowerPoint) on the computer.	1.37	0.64
I feel confident when I use technology for teaching in the classroom.	1.47	0.95
I feel confident when assisting my students to use computers in the classroom.	1.53	0.97
I want to use technologies in the classroom because it will make my teaching more interesting.	1.23	0.65
I want to use technology in the classroom because it will improve my students learning.	1.25	0.54
I want to find new and interesting ways of using technology in the classroom.	1.32	0.50
I view video on the Internet that are in English language	1.37	0.70
I believe that it is important to make use of technology in teaching EFL.	1.18	0.79

#### *Online tools*

A large majority of participants (95.9%) either agreed or strongly agreed with the use of online tools such as a dictionary, translator or thesaurus to support learning in their EFL classrooms.

### *Technology makes teaching interesting*

A large majority of participants (95.9%) either agreed or strongly agreed that using technology in the classroom would make their teaching more interesting. This indicates that the majority of participants think that using technology in the classroom makes teaching more interesting.

### *Interesting ways of using technology*

A large majority of participants (98.6%) either agreed or strongly agreed that they wanted to find new and interesting ways of using technology in the classroom. This indicates that most participants wanted to find new and interesting ways of using technology in the classroom.

### *Make use of technology in teaching English*

All participants either agreed or strongly agreed with the knowledge about the importance of using technology in teaching EFL. Results indicate that all participants believe that it is important to use technology in teaching EFL.

#### **5.1.4.2 Technology and pedagogy knowledge**

Results indicated that EFL teachers possessed sufficient technology and pedagogy knowledge. Eleven items in the online survey comprised the technology and pedagogy knowledge factor in order to support learning in the classrooms. The mean value of technology and pedagogy knowledge factor among the participants was 1.50 with a standard deviation of 0.54, which was progressive and significant. The means and standard deviations of the responses to these 11 items are presented in Table 5.10.

Table 5.10 *Factor 2: Technology and pedagogy knowledge*

Items	Mean	SD
I know how to create and edit text (e.g., Word).	1.42	0.67
I know how to solve my own technical problems.	1.70	0.96
I have the technical skills I need to use technology.	1.55	0.77
I can learn technology easily.	1.23	0.43
I know about a lot of different technologies.	1.67	0.90
I use a variety of software (Word, PowerPoint, etc.) when evaluating students.	1.80	1.14
I can choose technologies that enhance teaching process.	1.51	0.66
I know about technologies that I can use for understanding and doing English language.	1.55	0.65
I look for online resources when selecting materials to use for my English language class.	1.54	0.82
I have the ability to use technology in English language teaching.	1.41	0.69
I have sufficient knowledge about English language.	1.36	0.51

### *Text creation and editing*

The participants' use of tools to create and edit text in the classroom was important as it is appeared to polishing their use of technology. In the online survey, a large majority of participants (91%) either strongly agreed or agreed that they know how to create and edit text. This indicated that participants made use of widespread text tools like word-processing software with the students in their EFL classrooms.

#### *Having technical skills*

A large majority of participants (89.2%) either agreed or strongly agreed that they have technical skills. Results indicate that the majority of participants claim they have the technical skills that EFL teachers need to use technology.

#### *Evaluate students learning*

The majority of participants (79.74%) either agreed or strongly agreed that they used a variety of software when evaluating students. Results indicate that the majority of participants use a variety of software (Word, PowerPoint, etc.) when evaluating students.

#### *Online resources for the English language classes*

A large majority of participants (94.5%) either agreed or strongly agreed with the knowledge of online resources when selecting materials to use in the EFL classes. This result indicates that the majority of participants look for online resources when selecting material to use for English language classes.

#### **5.1.4.3 Enjoyment**

Results indicated that EFL teachers enjoyed using technology in the classroom. Eight items in the online survey created the enjoyment factor in order to support learning in the classrooms. The mean value of enjoyment factor among the participants was 1.60 with a standard deviation of 0.62, which was affirmative and substantial. The means and standard deviations of the responses to these nine items are presented in Table 5.11.

Table 5.11  
Factor 3: *Enjoyment*

Items	Mean	SD
I know how to create presentations (e.g., PowerPoint).	1.35	0.73
I believe that students enjoy using technology in the classroom.	1.23	0.60
I believe that students will learn more if technologies are used in the classroom.	1.15	0.44
I prepare short lesson plans for myself in relation to technology use.	1.92	0.99
I prepare semester-length plans that include the use of technology in the classroom.	2.00	1.07
I prepare plans that include new and interesting ways to use technology in the classroom.	2.08	1.03
I use a variety of software (PowerPoint, Flash, Word, etc.) when presenting lessons.	1.61	0.86
I make my classes interesting and stimulating by using technology in English language teaching.	1.53	0.83

#### *Students enjoy using technology*

A large majority of participants (98.7%) either agreed or strongly agreed that students should have access to technology in every classroom. Only 3.9% of participants disagreed. Accordingly, the majority of participants believed that students enjoy using technology in the classroom.

#### *Prepare lessons*

A large majority of participants (86.5%) either agreed or strongly agreed with the knowledge of using a variety of software in preparing lesson plans. Results indicate that the majority of participants use variety of software (MS-Word, PowerPoint, Photoshop etc.) for preparing for lesson plans.



### *Making classes interesting and stimulating*

A large majority of participants (85.1%) agreed or strongly agreed with the ability to make classes interesting and stimulating by using technology in EFL teaching. Results indicate that the majority of participants can make classes interesting and stimulating by using technology in English language teaching.

#### **5.1.4.4 Teaching strategies**

Results indicated that EFL teachers applied teaching strategies by using technology in the classroom. Nine items in the online survey framed the teaching strategies factor in order to support learning in the classrooms. The mean value of teaching strategies factor among the participants was 1.80 with a standard deviation of 0.54, which was practical and important. The means and standard deviations of the responses to these eight items are presented in Table 5.12.

Table 5.12  
*Factor 4: Teaching strategies*

Item	Mean	SD
I can explain how the use of computers can help students to learn the English language.	1.60	0.69
I can develop an English language course.	1.77	0.82
I consider myself to be an experienced teacher with sufficient years of experience in pedagogy.	2.03	0.96
I know how to organise and maintain classroom management.	1.54	0.63
I can adapt my teaching style to different learners.	1.51	0.58
I use diverse teaching strategies in facilitating the instruction of EFL.	1.66	0.61
I give tests in English as a foreign language subjects that address both lower- and higher-order think.	2.19	1.01

I implement teaching methods to help slow learners in my EFL class.	2.04	0.94
I can select effective teaching strategies to guide students in EFL.	1.83	0.68

### *Classroom management*

A large majority of participants (95.5%) agreed or strongly agreed with the knowledge about classroom management. This indicates that the majority of participants know how to organise and maintain classroom management.

### *Adapting teaching style*

A large majority of participants (95.9%) agreed or strongly agreed with the ability to adapt teaching style to different learners. This indicates that the majority of participants can adopt their teaching style to different learners.

### *Use diverse teaching strategies*

A large majority of participants (95.5%) agreed or strongly agreed with the using diverse teaching strategies in facilitating the instruction of EFL. Results indicate that the majority of participants use diverse teaching strategies in facilitating the instruction of EFL.

### *Implement teaching method*

The majority of participants (80.8%) agreed or strongly agreed with the ability to implement teaching method to help slow learners in the classroom. Results indicate that the majority of participants can implement teaching methods to help slow learners in EFL classes.

#### 5.1.4.5 Use of software

Results indicated that EFL teachers were using software in the classroom.

Four items in the online survey framed the use of software factor in order to support learning in the classrooms. The mean value of use of software factor among the participants was 3.70 with a standard deviation of 1.35, which was useful and essential. The means and standard deviations of the responses to these four items are presented in Table 5.13.

Table 5.13  
*Factor 5: Use of software*

Item	Mean	SD
Map concepts (e.g., Kidspiration, Inspiration).	3.69	1.33
Develop web pages (e.g., FrontPage).	3.69	1.47
Develop multimedia (e.g., HyperStudio).	3.65	1.47
Engage in virtual worlds, simulations (e.g., Second Life).	3.71	1.49

#### *Map concepts*

About 58.9% of participants either disagreed or strongly disagreed that they used concept mapping software (Kidspiration, Inspiration) in the classroom. Only 20.5% of participants either agreed or strongly agreed with the use of concept mapping software in the classroom. The result indicates that the majority of participants did not use concept mapping software in the classroom to support learning.

### *Web pages*

The majority of participants (61.6%) did not utilise developing webpages (Front Page) as a means of supporting English language learning in the classroom.

### *Multimedia*

About 60.3% of participants indicated that they did not utilise multimedia (HyperStudio) in the classroom. Only 28.2% of participants were in favour of using multimedia in the classroom. Just 11.5% of the participants were neutral towards using multimedia in the classroom.

### *Engagement with the virtual world*

Most participants (62.8%) did not engage in virtual world simulations as a language-learning strategy in the classroom.

#### **5.1.4.6 Communication**

Results indicated that EFL teachers communicated with students in the classroom. Five items in the online survey outlined the communication factor in order to support learning in the classrooms. The mean value of communication factor among the participants was 1.80 with a standard deviation of 0.76, which was practical and important. The means and standard deviations of the responses to these five items are presented in Table 5.14.

Table 5.14  
Factor 6: Communication

Item	Mean	SD
Communicate by text (e.g., chat, email) (USE)	1.78	1.01
Communicate with visuals (e.g., Skype, videoconference).	2.21	1.48
Demonstrate educational software (e.g., CD-ROM, learning objects).	1.96	1.27
I have various strategies of developing my English-language skills (e.g., reading and watching).	1.56	0.60
I know how to assess student performance in the classroom.	1.47	0.53

*Text-based technology communication in the classroom*

Most of participants (76.9%) either agreed or strongly agreed with the use of text-based technology communication (chat, email) in the classroom. The result indicates that participants made use of communication by text in their EFL classes. A few teachers expressed their negative views towards chatting.

*Communication with visuals*

The majority of participants (61.5%) either agreed or strongly agreed that they used visual communication (e.g., Skype, videoconferencing); 11.5% of participants were neutral, whereas 26.9% of participants either disagreed or strongly disagreed that they used communication through visuals such as Skype, videoconferencing, etc.

*Assess students' performance*

A large majority of participants (98.6%) agreed or strongly agreed that they had the knowledge of how to assess student performance in the classroom. This

indicates that the majority of participants know how to assess students' performance in the classroom.

#### 5.1.4.7 Technology that assists learning

Results indicated that EFL teachers were using technologies that assist learning in the classroom. Four items in the online survey framed the technology that assists learning factor in order to support learning in the classrooms. The mean value of technology that assists learning factor among the participants was 1.50 with a standard deviation of 0.77, which was effective and essential. The means and standard deviations of the responses to these four items are presented in Table 5.15.

Table 5.15  
*Factor 7: Technology that assists learning*

Items	Mean	SD
I think that using technologies in the classroom will make teaching simpler.	1.18	0.48
I think that using technology to facilitate teaching will be boring for my students.	1.52	1.05
I think that using technology in the classroom will interfere with my teaching.	1.80	1.20
I feel nervous about having to use a technology while teaching.	1.62	1.07

#### *Technology simplifies teaching*

A large majority of participants (95.9%) either strongly agreed or agreed that technology use in the classroom makes teaching EFL simpler. This result indicates that the majority of participants want to use technology in the classroom to make teaching simpler.

#### *Using technology to facilitate teaching*

A large majority of participants (88%) either disagreed or strongly disagreed with the statement that using technology will facilitate EFL learning.

#### *Technology interferes with teaching*

The majority of participants (76.7%) either disagreed or strongly disagreed with the statement that using technology will interfere with EFL teaching in the online survey. The majority of participants believed that the use of technology in the classroom would not interfere with their teaching.

#### **5.1.4.8 Original TPACK scale**

TPACK is not supported by factor analysis but the research show that these factors exist. Sample size could be the reason for factor analysis to not support TPACK structure. To date, researcher has not located any research that describes the validation of a TPACK instrument. TPACK is not reliable because it does not stand up to detailed analysis. As a result, the original TPACK analysis was considered and the research questions analysed and addressed using the original TPACK structure.

Twenty-eight items in the online survey collected data about the participants' perception of TPACK. The seven components of TPACK were covered. The overall mean score of TPACK components was 1.7 with overall standard deviation of 0.62. The average total scores for each component indicated a good level of components

agreement. Descriptive analyses of TPACK components were positive and significant, but not supported by factor analysis. Table 5.16 shows the original overall scale score, standard deviation and components' reliability of TPACK.

Table 5.16  
*TPACK descriptive analysis*

TPACK component	Mean	SD	Reliability
Technology Knowledge (TK)	1.50	0.67	0.88
Technological Pedagogical Knowledge (TPK)	1.64	0.79	0.86
Technological Content Knowledge (TCK)	1.50	0.61	0.78
Technological Pedagogical Content Knowledge (TPCK)	1.60	0.52	0.75
Content Knowledge (CK)	1.95	0.63	0.65
Pedagogical Knowledge (PK)	1.64	0.52	0.75
Pedagogical Content Knowledge (PCK)	1.91	0.64	0.78

a) Technology Knowledge (TK)

Table 5.16 shows that TK means scale score was 1.50 with standard deviation of 0.67. TK means score and standard deviation indicates highly significant perceptions among EFL teachers.

b) Technological Pedagogical Knowledge (TPK)

Table 5.16 shows that TPK means scale score was 1.64 with standard deviation of 0.79. TPK means score and standard deviation goes higher when technology incorporated with the pedagogical knowledge. The means score shows that EFL teachers appreciated the role that technology played in learning.



c) Technological Content Knowledge (TCK)

Table 5.16 shows that TCK means scale score was 1.50 with standard deviation of 0.61. TCK means score and standard deviation indicates high technological exposed to learning EFL.

d) Technological Pedagogical Content Knowledge (TPCK)

Table 5.16 shows that TPCK means scale score was 1.60 with standard deviation of 0.52. TPCK mean score and standard deviation depicts EFL teachers' responsiveness of knowledge intersects.

e) Content Knowledge (CK)

Table 5.16 shows that CK means scale score was 1.95 with standard deviation of 0.63. CK means score was the highest means score of TPACK components. The means score of CK indicates that EFL teachers understood the content of EFL they perform in the classroom.

f) Pedagogical Knowledge (PK)

Table 5.13 shows that PK means scale score was 1.64 with a standard deviation of 0.52. PK means score and standard deviation indicates that EFL teachers were able to facilitate the learning process in the classroom.

g) Pedagogical Content Knowledge (PCK)

Table 5.13 shows that PCK means scale score was 1.91 with standard deviation of 0.64. PCK means score and standard deviation shows that teachers were able to facilitate the learning of EFL in the classroom.

Twenty-eight items in the online survey collected information on participants' perceptions of TPACK. The responses are described above within the seven components of TPACK. EFL teachers show a high perception of use of technology when delivering the instructions of EFL. Data analysis indicated that factor analysis did not support TPACK components. It is possible that the small sample size could be the reason for the lack of support for the previously supported structure of the instrument. Accordingly, the research questions were analysed using the original TPACK structure.

#### **5.1.5 Internal Reliability**

Internal reliability is a procedure for measuring and verifying the constructed items (Cooksey, 2007). Internal reliability was measured using Cronbach's Alpha. An acceptable level of reliability for a research-designed scale is 0.6 or greater (Cooksey, 2007). The constructed items were at a satisfactory level of reliability.

Before analysis could proceed the three negatively coded items: 21, 22 and 23 had to be reverse-coded (Field, 2005). Values of Cronbach's Alpha for the founded factors are presented in Table 5.17.

Table 5.17  
*Values of Cronbach's Alpha*

Scale	Cronbach's Alpha
Use of technology	0.90
Technology and pedagogy knowledge	0.91
Enjoyment	0.89
Teaching strategies	0.85
Use of software	0.94
Communication	0.79
Technology that assists learning	0.80

All factors were in the acceptable range (Cronbach's Alpha = 0.71).

Cronbach's Alpha indicated a good internal reliability.

#### **5.1.6 Multivariate analyses of variance**

Multivariate Analysis of Variance (MANOVA) model are presented in Table 5.18. The associated multivariate statistics show that none of the demographic variables contribute to the model. Thus, the researcher cannot draw any valid conclusions from the model after considering age, location, qualifications and teaching experience as possible factors affecting EFL teachers' use of technology practice (Table 5.19).

Table 5.18  
*Multivariate Tests<sup>b</sup>*

Variables	Pillai's Trace	Wilks' Lambda	Hotelling's Trace	Roy's Largest Root	F
Intercept	0.67	0.32	2.06	2.06	10.09 <sup>a***</sup>
Location	0.11	0.88	0.13	0.13	0.64 <sup>a</sup>
Age group	0.16	0.84	0.19	0.19	0.93 <sup>a</sup>
Highest qualification	0.21	0.78	0.27	0.27	1.34 <sup>a</sup>
Years of experience	0.16	0.83	0.20	0.20	0.99 <sup>a</sup>

\*\*\* $p < .001$

Table 5.19  
*Tests of Between-Subjects Effects*

Source	Dependent Variable	F	Sig.
Corrected Model	Use of Technology	3.38	0.02
	Technology and Pedagogy Knowledge	1.26	0.30
	Enjoyment	1.17	0.33
	Teaching Strategies	0.13	0.96
	Use of Software	0.59	0.67
	Communication	3.01	0.03
	Technology that Assist Learning	0.11	0.97
Intercept	Use of Technology	14.51	0.00
	Technology and Pedagogy Knowledge	3.28	0.07
	Enjoyment	2.31	0.13
	Teaching Strategies	13.46	0.00

Location	Use of Software	9.17	0.00
	Communication	2.72	0.10
	Technology that Assist Learning	6.80	0.01
	Use of Technology	0.87	0.35
	Technology and Pedagogy Knowledge	0.02	0.87
	Enjoyment	0.09	0.75
	Teaching Strategies	0.04	0.83
	Use of Software	1.07	0.30
Age	Communication	0.72	0.40
	Technology that Assist Learning	0.12	0.72
	Use of Technology	0.03	0.85
	Technology and Pedagogy Knowledge	0.91	0.34
	Enjoyment	0.27	0.60
	Teaching Strategies	0.43	0.51
	Use of Software	0.59	0.44
	Communication	6.37	0.01
Qualification	Technology that Assist Learning	0.07	0.78
	Use of Technology	3.09	0.08
	Technology and Pedagogy Knowledge	0.05	0.81
	Enjoyment	1.09	0.30
	Teaching Strategies	0.04	0.84
	Use of Software	0.00	0.99
	Communication	0.25	0.61
	Technology that Assist Learning	0.22	0.64
Years of experience	Use of Technology	4.99	0.03
	Technology and Pedagogy Knowledge	0.06	0.80
	Enjoyment	0.01	0.90

Teaching Strategies	0.07	0.79
Use of Software	0.40	0.53
Communication	0.21	0.64
Technology that Assist Learning	0.01	0.91

\*  $p < .05$ ,      \*\*  $p < .01$ ,      \*\*\*  $p < .001$

### 5.1.7 Individual group means

#### a) Age means value

Technology that assists learning factor was significantly linked to participants' age (Table 5.20). However, the mean value of use of technology and technology that assists learning factor was significantly higher for the 36 to 45 years age group. Mean values of use of technology and teaching strategies factor were highest for the 46 or older age group (which was not expected). Technology that assists learning factor was highest for the 25 or younger group, but this group scored lowest in teaching strategies factor. Mean values of use of technology and teaching strategies factors were highest for the 26 to 35 years age group. For mean values of all constructs by age, see Appendix 3.

Table 5.20  
*Age in relation to the factors*

Source	Mean Square	F	Sig.
Corrected model	1.03	2.18	0.06
Intercept	5.81	12.31	0.00
Use of technology	0.04	0.08	0.77
Technology and pedagogy knowledge	0.46	0.99	0.32

Enjoyment	0.30	0.64	0.42
Teaching strategies	1.74	3.70	0.06
Use of software	0.24	0.51	0.47
Communication	2.14	4.54	0.03
Technology that assists learning	0.14	0.30	0.58

b) Qualifications means value

Use of software factor was significantly related to participants' qualifications (Table 5. 21). The mean value of use of technology factor was highest for PhD holders. Factors of use of technology, teaching strategies and enjoyment were highest for Master's degree holders. The technology and pedagogy factor score was highest for Bachelor's degree holders. TCK and TPCK were lowest for Bachelor's degree holders. For mean values of all constructs by qualification, see Appendix 4.

Table 5.21  
*Qualification in relation to the factors*

Source	Mean Square	F	Sig.
Corrected model	0.33	0.79	0.59
Intercept	15.49	36.63	0.00
Use of technology	0.39	0.94	0.33
Technology and pedagogy knowledge	0.74	1.75	0.19
Enjoyment	0.41	0.98	0.32
Teaching strategies	0.83	1.98	0.16
Use of software	0.01	0.04	0.83
Communication	0.05	0.12	0.72
Technology that assists learning	0.17	0.40	0.53

c) Years of experience mean value

Use of software factor was significant to participants' years of experience (Table 5.22). However, use of technology factor was highest for those who had been teaching English for 11–15 years. Use of technology scores was highest for those who had been teaching English for 16 years or more (which was unexpected). Technology that assists learning score was highest for those who were teaching English for 1–5 years. It was noticed that communication factor had a low value for those who were teaching English for 1–5 years. Use of software mean scores was highest for those who had been teaching English for 6–10 years. For the years of experience mean values of all constructs, see Appendix 5.

Table 5.22  
*Years of experience in relation to the factors*

Source	Mean Square	F	Sig.
Corrected model	1.39	1.91	0.09
Intercept	5.42	7.47	0.00
Use of technology	2.44	3.37	0.07
Technology and pedagogy knowledge	0.16	0.22	0.63
Enjoyment	0.47	0.65	0.42
Teaching strategies	1.86	2.56	0.12
Use of software	0.05	0.07	0.79
Communication	1.30	1.79	0.19
Technology that assists learning	0.29	0.40	0.53



## 5.2 RESEARCH QUESTIONS

This section brings together the results relevant to the nine research questions (see section 1.7). Results relating to the three dimensions of the study (use of technology to support learning, willingness to use technology to support learning and TPACK) are presented. There were three research questions for each dimension. Results relating to each of the seven components of TPACK framework are shown individually. Data source and justification for the research questions were presented in Table 5.23.

Table 5.23

*Data sources and their justification of the research questions*

Research Question	Data Source	Justification
What is the perception of EFL teachers on the use of technology in teaching in Saudi Arabia?	Survey	To allow teachers to choose the accurate reading of their teaching environment.
What is the relationship between EFL teachers' perceptions of the use of technology in teaching and their perception of TPACK?	Survey & interview	To provide a mechanism for assessing relationship identify between use of technology and TPACK
What factors affect the extent to which EFL teachers use technology in teaching in Saudi Arabia?	Survey & interview	To label all possible factors affecting the use of technology in teachers' daily work.
How willing are EFL teachers to use technology to support learning in Saudi Arabia?	Survey	To find out the actual sings of the teaching environment.
What is the relationship between EFL teachers' perceptions of willingness to use technology in teaching and their perception of TPACK?	Survey & interview	To refer to the agreement level of cognitive awareness of technology use and teaching style.
What factors affect EFL teachers' willingness to use technology in teaching?	Survey & interview	To identify all possible factors affecting teachers' willingness to use technology.
What is the perception of TPACK among EFL teachers in Saudi Arabia?	Survey & interview	To form a clear picture of the extent of teacher use of technology in teaching EFL.
How do EFL teachers' perceptions of TPK, TCK and PCK relate to their perception of TPACK?	Survey & interview	To determine the nature of the relationship between the second levels of knowledge with the final required level of knowledge.
What factors affect the perception of EFL teachers' TPACK?	Survey & interview	To add complexity pertaining to each of the components of the TPACK framework.

### 5.2.1 Use of technology to support learning

RQ 1: What is the perception of EFL teachers on the use of technology in teaching in Saudi Arabia?

The mean score of use of technology items was 2.45 with a standard deviation of 0.51. Subsequently, the level of agreement for the use of technology to support learning is significant, the EFL teachers were actually using technology to support learning in the classroom.

RQ 2: What is the relationship between EFL teachers' perceptions of the use of technology in teaching and their perception of TPACK?

The relationship between EFL teacher's perception of willingness and their perception of TPACK is presented in Table 5.24. The correlation coefficient between use of technology and TPACK was identical (0.51), which was positive and statistically significant at 0.001 levels.

The identical correlation coefficient between use of technology and TPACK shows a perfect positive linear relationship: as use of technology increases in its values, the TPACK also increases in its values via an exact linear rule.

Table 5.24  
*Relationship between use of technology and TPACK*

		USE	TPACK
USE	Pearson Correlation	1	0.51***
TPACK	Pearson Correlation	0.51***	1

\*\*\*  $p < .001$ ,  $n = 93$

The relationship between use of technology in EFL teachers and their perception of TPACK is presented in Table 5.25. The correlation coefficients between use of technology and TPACK were positive at 0.001 levels.

Table 5.25  
*Coefficients<sup>a</sup> between use of technology and TPACK*

Model	B	Beta	..
1 (Constant)	1.00		3.45***
TPACK	0.84	0.51	5.01***

\*\*\*  $p < .001$

RQ 3: What factors affect the extent to which EFL teachers' use technology in teaching in Saudi Arabia?

The factors affecting technology use are presented in Table 5.26. The model shows that the only factor significantly affecting technology use was PCK. TK, TPK and PK had a negative effect on the use of technology, but these effects were not significant.

Table 5.26  
*Factors affecting EFL teachers' use of technology*

Model	B	Beta	<i>t</i>
1 (Constant)	1.080		3.28**
WILL	0.18	0.12	0.71
TK	0.10	- 0.09	- 0.67
TPK	0.19	0.21	1.27
TCK	0.34	0.28	1.68

TPCK	- 0.10	- 0.07	- 0.36
CK	0.07	0.064	0.52
PK	- 0.21	- 0.14	- 0.97
PCK	0.38	0.33	2.46

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**\*\*  $p < .01$**

### 5.2.2 Willingness to use technology to support learning

Q4: How willing are EFL teachers to use technology to support learning in Saudi Arabia?

The mean score for willingness items was 1.50 with a standard deviation of 0.51. Since the level of agreement for the constructs is 1.5, the results show that EFL teachers were willing to implement technology.

Q5: What is the relationship between EFL teachers' perceptions of willingness to use technology in teaching and their perception of TPACK?

The relationship between EFL teachers' perceptions of willingness and their perception of TPACK is presented in Table 5.27. The correlation coefficient between willingness and TPACK was positive and significant (0.72).

Table 5.27  
*Relationship between willingness and TPACK*

		WILL	TPACK
WILL	Pearson Correlation	1	0.72***
TPACK	Pearson Correlation	0.72***	1

\*\*\*  $p < .01$  n = 93

The coefficient between EFL teachers' perceptions of willingness and their perception of TPACK is presented in Table 5.28. The beta coefficients between willingness and TPACK were positive and significant.

Table 5.28  
*Coefficients<sup>a</sup> between willingness and TPACK*

Model	B	Beta	t
1 (Constant)	0.71		6.21***
WILL	0.65	0.72	8.85***

\*\*\*  $p < .01$

Q6: What factors affect EFL teachers' willingness to use technology in teaching?

Factors affecting willingness are presented in Table 5.29. It shows that the only factor significantly affecting willingness was TPCK at 0.05 levels. TCK, CK and PK were had a negative effect on willingness, but it was not significant.

Table 5.29  
*Factors affecting EFL teachers' willingness*

Model	B	Beta	t
1 (Constant)	0.33		1.98
USE	0.04	0.06	0.71
TK	0.11	0.15	1.45
TPK	0.12	0.19	1.56
TCK	- 0.06	- 0.08	- 0.62
TPCK	0.62	0.64	5.53***
CK	- 0.01	- 0.01	- 0.15
PK	- 0.08	- 0.08	- 0.78
PCK	0.03	0.03	0.33

\*\*\*  $p < .001$

### 5.2.3 TPACK

RQ 7. What is the perception of TPACK among EFL teachers in Saudi Arabia?

The mean score of EFL teachers' perceptions of TPACK in Saudi Arabia was 1.7 with a standard deviation of 0.44 with range between 1.00 and 2.64. The perception of TPACK among EFL teachers was positive in the regression used.

RQ 8: How do EFL teachers' perceptions of TPK, TCK and PCK relate to their perception of TPACK?

The relationship between EFL teacher perception of TPK, TCK, PCK and their perception of TPACK is presented in Table 5.30. The correlation coefficient between TPACK and TPK was 0.81, TCK was 0.74 and PCK was 0.68, which were positive and also significant at 0.001 levels.

Table 5.30  
*Relation of TPACK with second level of knowledge*

		TPACK
TPK	Pearson Correlation	0.80***
TCK	Pearson Correlation	0.74***
PCK	Pearson Correlation	0.68***

\*\*\*  $p < .01$   $n = 93$

The beta coefficients between TPACK and TPK, TCK and PCK were positive in the regression model used (see Table 5.31). They were also significant at 0.001 levels.

Table 5.31  
Beta Coefficients<sup>a</sup> for second level of TPACK

Model	B	Beta	t
1 (Constant)	0.38		5.36***
TPK	0.22	0.41	6.18***
TCK	0.23	0.32	5.05***
PCK	0.28	0.41	8.20***

\*\*\*  $p < .001$

RQ 9: What factors affect the perceptions of EFL teachers' TPACK?

Factors affecting TPACK are presented in Table 5.32. The factors significantly affecting TPACK were all TPACK components (TK, TPK, TCK, TPCK, CK, PK and PCK), since the beta coefficients were positive and also the t values were large and significant at 0.001 levels.

Table 5.32  
Factor affecting TPACK

Model	B	Beta	t
1 (Constant)	- 0.00		- 0.50
USE	- 0.00	- 0.01	-1.30
WILL	0.00	0.00	0.04
TK	0.14	0.22	50.06***
TPK	0.13	0.24	46.61***
TCK	0.14	0.20	37.04***
TPCK	0.14	0.17	28.08***
CK	0.14	0.20	53.89***
PK	0.14	0.16	33.93***
PCK	0.14	0.21	47.49***



\*\*\*  $p < .001$

### 5.3 Interview

This section provides the results of the interview, separated into subsections on interview response rate, use of technology to support learning, willingness to use technology to support learning, teachers' perceptions of TPACK and attitudes towards adopting technology in the EFL classroom.

#### 5.3.1 Interview response rate

Twenty-four EFL teachers indicated that they would take part in the interview. Based on their online survey responses, the researcher identified ten of them for the interview, as their surveys contained some inconsistent responses. This represented a response rate of approximately 42% of those who had agreed to be interviewed. For an interview, this response rate would be considered sufficient (Dillman, 2009).

Based on the survey analysis, 14 items were identified for further scrutiny in the qualitative interview. These items were further discussed with the interviewee in order to understand the reasons behind their responses and to explore disparities between EFL teachers' willingness to use technology to support learning and their perception of actual use. This included identifying barriers and enablers to using technology. Results of analysis of the interview transcripts for each of the 14 survey items are presented in the following sections.

### 5.3.2 Use of technology to support learning

#### a) Creating graphics (e.g., Paint)

The interviewees who already reported using technology in their EFL teaching were asked their opinion on the value of creating graphics as a classroom teaching tool; most EFL teachers gave a positive response. The teachers agreed that visual aids are a powerful tool but depends on the quality of the graphics. Graphics can be used and understood by all of the students as well as the teacher. On the other hand, most of the EFL teachers stated that because graphics serve as a universal language, there is a small possibility of misunderstanding or interpreting the English language. The hindrances that are created by the language itself can be an important instrument in this regard. Most interviewees agreed that the use of graphics plays a very important role within the classroom. Implementing technology is an important aspect of classroom learning for the students as well as teachers. EFL teachers have high willingness to use graphics as a learning tool.

The teachers' response in regard to the question about using or creating graphics as an instrument for supporting learning activities was highly willing. The reason for this was that the use of technology is seen as an important technology of the learning process. Moreover, in certain learning activities graphics can aid memorisation better than in traditional learning.

When the teachers were asked to further explain their survey responses, one interviewee stated that he was confused when he read the item. He stated: *"I was*

*not sure whether you were asking about the actual use of graphics or about the importance of them”.*

The interviewees explained their high perception of use of graphics by saying that the government provides them with the technology, so it is important to make the most of it. Further, it also helps them to communicate more effectively with the students, as the students are more satisfied when a concept is communicated through visual aids

b) Communicating with visuals (e.g., Skype, videoconference)

*“It is clear that communication is one of the important aspects in learning EFL”,* Omar said. Khalid believes that *“communication tools play a magic role, especially when all of the EFL teachers are not native”* and *“using visuals helps me to get closer to my students”*. Teachers emphasised that communication through the use of visual aids occupies an important place in their lessons, as it creates a more effective teaching and learning environment. Communicating with visuals can help to generate more authentic learning materials. In addition, the communication in this case can be reviewed again. Interviewees believed that communicating through the use of visual aids helps to develop stronger understanding of language.

The two respondents explained that communication is an essential part of the EFL classroom. EFL teachers can communicate with students via Skype, instant messages or exchange of visual files as part of the learning process. As the results of the survey showed inconsistency in regard to communication with visual aids, it can be concluded that many EFL teachers were not convinced about the practicality

of implementing the technical aspects of visual aids. The interviews indicate that the reason was due to the fact that some EFL teachers were not willing to use the technology in spite of its availability. Loss of classroom control was another reason cited by teachers who rejected the idea of communicating with visual aids; for example, Ali stated, *"Using visuals creates laziness among students"*. These teachers regarded traditional face-to-face communication as the best way to learn.

c) Access to the Internet to gather and obtain information

According to the interview responses about whether the teachers use and have access to the Internet, nine EFL teachers were willing to use the Internet as a teaching tool and did so in practice as well. These teachers viewed the Internet as very useful in technical college classrooms. Computers and the Internet enable teachers and students to gather information much more rapidly than traditional libraries. Omar said, *"Internet is the best technology to get more information about the English language"*. Therefore, it also serves as an electronic library, making it easier for the teachers as well as the students to collect and gather authentic information. Furthermore, the Internet provides access to new methods and areas of research and new experiments and their results can also be analysed through the Internet. This reflects the strong belief in access the Internet to enhance EFL learning in

the classroom. Therefore, the Internet has been used within EFL classrooms as an instant method of gathering information.

The interview responses show that the Internet is useful in improving English- language learning and development for the students, as it provides

verification and validity for data that has been gathered or provided. On the other hand, certain information can be documented in order to provide justification for certain content. *“The content of the Internet is available in different languages, [which is] one of the most important aspects of this tool mentioned by students”* Omar said.

Respondents explained that through the Internet, students and teachers not only communicate but can share important aspects of learning with each other. For this reason, interviewees believed that there is a higher willingness to use the Internet, as well as higher actual usage. The interviewees thought that EFL teachers in Saudi Arabia were very willing to use the Internet and did use it. Therefore, the data show that the use of the Internet is a very important part of EFL learning in a technical college.

d) Access to online tools (e.g., dictionary, translator, thesaurus)

The data show that the respondents use internet access and internet tools in order to support learning. The respondents explained that internet and other online tools can be used to find information. There is positive evidence in favour of the use of the online tools. According to the interviewees, accessing internet tools like dictionaries, translators and thesauruses helps students to learn the English language. The majority of the respondents agreed that because it is easier for students to understand information or knowledge in their native languages, dictionaries and translators are therefore important tools. The interviewed EFL teachers use these online tools extensively in their technical college teaching.

The process of learning is highly influenced by the use of these tools. Tools like a dictionary and translators are known to speed up the process of learning by providing essential knowledge. When the respondents were asked why they opted for these results, it was found that they were highly convinced with the ease of accessing online tools and therefore, these tools had a higher perception of usage as well.

Most of the interviewees explained that internet tools make many learning options available. As the process of learning involves many stages, and as understanding the content being one of the most important stages, these online tools help EFL teachers at all levels and stages.

e) Engaging in virtual worlds, simulations (e.g., Second Life)

It was clear from the interviews that virtual worlds do not currently play a major role in EFL teachers' classrooms. Five interviewees had read about Second Life or other virtual worlds, and some had interacted with them online. Unsurprisingly, the technical colleges do not train their teachers in the use of virtual worlds, and (equally unsurprisingly) EFL teachers varied greatly in their reported use of and attitude to virtual worlds. Ali said, *"Whatever the virtual world, there is no time to use it because I must complete the curriculum that does not include such a thing"*. Majed believed that *"due to the hectic routines, the brain gets saturated and there is no place for a virtual world"*. It is very important for EFL teachers to be involved in activities such as online gaming (Chen, et al., 2010); involving students in the virtual world is a plausible way of developing and maintaining students' interest. Most

online games and virtual worlds use English language; therefore involving the students in them can help them to develop their English-language skills.

The interview data show that the EFL teachers involved with virtual worlds developed more innovative activities within the classroom than those who did not pursue these activities. Omar explained that the process of using these activities is not as popular among the students as it used to be. Moreover, EFL teacher might not be willing to use these technologies. On the other hand, the TVTC administration did not develop any sessions for the teachers in order to increase the interest in virtual activities, especially the online virtual communities.

### **5.3.3 Willingness to use technology to support learning**

a) I believe that students should have access to technology in every classroom

Most interviewees considered that they should have access to technology in every classroom. When asked why they considered it to be important, most responded that technology helps students to increase their knowledge of the subject matter. These teachers also believed that technological integration helps in supporting learning, as it provides multiple ways in that information can be transferred to the students. In addition, technology enables students to access information independently. Using graphical representations, presentations, videos, and audio helps these teachers in motivating students to pay attention and learn.

The fact that the technical colleges often already provided technology in the teachers' classrooms influenced the interviewees' beliefs that teachers ought to have access to technology in the classroom. This also corresponds with the high



willingness of EFL teachers to use technology in their teaching. Using technology in the classroom develops better communication and paves the way to communicate outside the classroom as well.

The interviewees indicated that the interest of the student for using technology was to create diversity and develop their interests. Omar stated that the *"use of technology can help to develop students' concentration"*. Therefore, students are more likely to stay engaged and on task, reducing behavioural problems in the classroom. Staying engaged with technology has led to a greater willingness of the teachers to use technology in classrooms.

Two of the interviewees used technology in their classrooms but not willingly, and others were neither willing nor actually using technology. One interviewee did not think that students should have access to technology in every classroom. When asked why, he said that he believes that traditional teaching methods are more effective than modern technology-based learning styles and that he did not think that students should have access to technology. Ali said, *"It is difficult to maintain the students' attention when using technology"*.

b) I believe that students enjoy using technology in the classroom

During the interviews, most EFL teachers stated that they thought students enjoyed using technology in the classroom. According to them, the reason for this is that visuals, graphical illustrations, colourful presentations and images involved in technology-integrated teaching attract students, starting from the primary level.

The interviewees believed that students tended to pay more attention to such

teaching styles. Even the EFL teachers who were not in favour of or willing to use technology in classrooms believed that students paid more attention and were more involved when using technology, but thought that this could lead to deviation from the actual goal. Teachers with limited accessibility or familiarity to technology were willing to use technology within the classroom, but felt that their insufficient knowledge and training would hinder their use of technology.

EFL teachers who were not willing and not using technology did not think that their students enjoyed using technology in the classroom. When asked about the reason for their response, these teachers responded that their students preferred reading textbooks rather than computers and that they considered technology to be entertainment rather than educational.

c) I believe that students will learn more if technology is used in the classroom.

The interview data show that most of the teachers who are willing to use technology, whether they actually use it or not, feel that students will learn more if technology is used in classrooms. Omar said, “ *I think student wants the technology to be in the classroom to learn the language from different sources*”. For some teachers, this is due to the fact that they believe their students enjoy using technology, so they will be keener to seek new knowledge and improve their skills (such as communication, pronunciation, reading, etc.). The EFL teachers who were willing to use technology and reported high use of it in the interview believed that using technology communication tools meant students could more easily share information. Technology in the classroom encouraged students to use their PCs and

laptops outside school; furthermore, the interviewees stated that their students had become much more comfortable with technology via using it in the classroom.

Teachers who have low willingness and low use of technology, as well as teachers who have low willingness but high use of technology, tend to believe that students will not be able to learn more if technology is used in the classroom.

According to them, integrating technology into their teaching means they will be less able to control students and the type of information accessed in the classroom.

Furthermore, some feared that they lacked the leadership skills that would be helpful to maintain technology.

d) I think that using technology in the classroom will interfere with my teaching

When the EFL interviewees were asked about whether they believed that using technology in the classroom interfered (or would interfere) with their teaching, teachers with low willingness but high use of technology and teachers with low willingness and low use of technology agreed with that statement. When asked why, they replied that they experienced or feared loss of control over their students. Ali said, *"some of the student are better than me in the use of technology and they might hack my computer"*. The teachers also believed that students' use of technology was not effectively monitored either at home or at school. Many of the interviewees reported that they did not have the necessary technological skills that have led them to resist technology integration. They were more comfortable with traditional teaching styles, believing that the latter allowed teachers to monitor and assess students effectively.

On the other hand, the teachers with high willingness but low use of technology, and teachers with high willingness and high use of technology did not think that using technology in classrooms interfered with their teaching. Instead, they believed that technology provided them with a platform through that they could conduct their lessons more effectively.

- e) I prepare semester-length plans that include the use of technology in the classroom

When the interviewer asked whether the teachers included technology while planning and preparing their curriculum for the classroom, the teachers with high willingness and high use of technology and teachers with low willingness but high use of technology responded positively. Positive response was because of their positive opinions about the personal actual use of technology. Some of the teachers from this category, who were willing to use technology within their classroom, believed that technology had enhanced their teaching styles in the classroom.

According to the teachers with a positive view of technology, technology connects them and their students to an entire world of information, enabling everyone to obtain information almost anywhere and anytime. They believed that technology integration would help them in transferring knowledge effectively to their students. By integrating technology, EFL teachers focus on developing their students so that they can meet the challenges of the outside world. The technical college administrations encourage EFL teachers to plan lessons using technology, leading to the fact that some EFL teachers who are not willing to use technology in

the classroom include technology in their teaching styles simply to satisfy their administrators.

On the other hand, teachers with high willingness but low use of technology, as well as teachers with low willingness and low use of technology, did not include technologies while preparing their semester-length plans. Some of the teachers who were not willing to use technology taught at colleges whose administrations, they reported, were not strict about using technology within the classroom. Others, although highly willing to use technology, did not include it in their semester-length plans because they had never seen a plan that included technology. These teachers were willing to use technology but needed to gain more understanding of how to use it.

#### **5.3.4 TPACK**

- a) I use a variety of software (Word, PowerPoint, etc.) when evaluating students

EFL teachers with low willingness but high use of technology, as well as teachers with high willingness and high use of technology, stated that they used a variety of software to evaluate their students. These EFL teachers used the wide range of available technological methods and tools to assess students, such as PowerPoint, Microsoft Word and Microsoft Excel, and they asked students to use these programs in creating and submitting their assignments and giving presentations. In the teachers' view, these methods not only motivated students to seek more information, but they increased their habit of reading and writing and

improved their communication skills. EFL teachers assessed the understanding of the students, their writing skills, communication skills and listening skills.

Furthermore, technology helped teachers to quickly respond and provide assistance to the students about their performance in the classroom.

In contrast, interviewees with low willingness and low use of technology were much less likely to use software for evaluating their students. Ali stated, *"I used the college's computer system only to record his students' final marks"*. The reason behind this was the teachers' own low willingness to use technology. These EFL teachers who are not willing to use technology hold themselves back because of the inconsistencies of their teaching and assessment. Another reason was that even if the EFL teachers were willing to use various tools, they were not trained, and their technical colleges did not invest much into establishing workshops internally or externally. Furthermore, such teachers lacked a proper understanding of how to use different types of technological tools to assess students in a way that contributed to their general lack of competence in using technology within classrooms.

b) I believe that it is important to make use of technology in teaching EFL

Teachers with high willingness but low use of technology, as well as high willingness and high use of technology and low willingness with high use of technology, believe that it is very important to use technology in teaching EFL. They believe that it enhances the communication between the teacher and the students, and that it helps EFL teachers to properly communicate their English language lesson and support their teaching with different English content available

online. Technology integration enabled EFL teachers to access online English dictionaries, and to listen to the audio pronunciations of English words.

Furthermore, podcasts and other audio recordings allowed EFL teachers to provide students with conversations for improving their listening and speaking skills.

According to these interviewees, technology helped the students and the EFL teachers to increase their vocabulary and improve their English language. Exercises available online were accessed by these EFL teachers and used in the classroom for practice. They do not just grab the attention of EFL teachers but also develop their interest in spending more time on learning English.

In contrast, EFL teachers with low willingness and low use of technology believe that traditional ways of teaching English, such as face-to-face instruction, grammar books and English language books, are more effective in teaching English.

- c) I have had extensive experience practicing English language in Western society

The teachers with high willingness but low use of technology and teachers with high willingness and high use of technology stated that they had extensive experience in practising their English-language skills in Western society.

Conversely, all EFL teachers who reported extensive experience in using English in Western countries were highly willing to use technology within the classroom.

They tended to have a better understanding of English than teachers who had not been immersed in Western society, and were confident seeking and using new ways to teach EFL. They had seen students in Western societies using technology

for academic purposes and thus understood its importance and benefits. In contrast, some teachers who had low willingness but were actually using technology and teachers who were not willing to use technology and reported low use of technology stated that they did not have much experience practising their English-language skills in Western society. Based on the interview data, religious beliefs and cultural factors are major obstacles to exposure to Western society.

d) I know how to assess student performance in the classroom

All EFL teachers stated that they knew how to assess students' performance in the classroom. The majority of EFL teachers believe that teachers modify their teaching approaches on the basis of student assessment. The interviewed EFL teachers agreed that the assessments most suitable to guide enhancements in student learning of English are tests, writing assignments, quizzes and pronunciation competitions in classrooms.

All EFL teachers in Saudi Arabian technical colleges, whether willing to use technology or not, have full access to many technological tools through which they can evaluate their students. Teachers who were not willing and reported low use of technology, as well as teachers who were willing but did not actually use technology, stated that they were more familiar with traditional ways for assessing students' performance within classrooms, including tests, examinations and hand-written assignments.



### **5.3.5 Cultural aspects of teaching English with technology**

The continued evolution of technology has enabled EFL teachers to develop improved methods of communication and learning. In EFL teaching, advancement in technology has created new ways for teachers to communicate and for students to learn. Despite technology's undoubted potential to improve teaching, the interviewed EFL teachers have varying viewpoints on the matter. Arguably, there are three types of EFL teachers in terms of use of technology and willingness to use technology: those who accept it without questioning, those who incorporate technology into instruction according to their classroom needs and those who reject technology altogether. Greater detail about those three types of EFL teachers, based on analysis of interview data, is presented next.

#### **a) Teachers who accept technology without questioning**

Some EFL teachers accept the English language and Western culture wholeheartedly and try to influence others to do the same. Similarly, these EFL teachers remain liberal and recognize the importance of how teaching English to Arab students would be helpful for them to develop a specific identity.

EFL teachers who accept teaching the language with its cultural aspects are difficult to find among the interviewees. This is because the dominant culture in Saudi Arabia is one that is not shaped by Western principles but by religious beliefs and values. That is why EFL teachers find it difficult to teach the English language and its culture using technology; there will be always barriers that limit the ability

of students to appreciate fully engagement in a topic that is totally different from their beliefs.

b) Teachers who choose the best available teaching methods

Another type of EFL teacher chooses the best approach in teaching English with proper technology. When teaching any foreign language, it is necessary for the teacher to bear in mind the culture as well as religious beliefs of the country. The use of technology by these teachers is notable, though in restricted instances. There are forms of technology that are internationally recognized and thus acceptable for all cultures. Selective teachers are likely to settle on the application of the technology that they deem acceptable not just for them, but also for society in general. EFL teachers choose the right technology and suitable tools that would benefit the interests of students. A good quality of these EFL teachers is the ability to adapt the needs of their students and to plan how instruction would be carried out to support the objectives of the classroom. Arguably, this group comprises the majority of EFL teachers among the interviewees.

The ability to recognise obstacles to learning is strength of this group. High-quality EFL teachers know how cultural differences and values can limit the ability of students to learn English, so these teachers try hard to teach students about Western culture. Most of these EFL teachers are liberal in allowing students to use technology to improve their ability to communicate with other cultures. Having students appreciate Western culture can give them better perspective on how

members of other cultures think, and modern communications technology provides a medium in that they can interact and develop positive relationships.

EFL teachers who belong in this category also believe that it would be advantageous for their students to learn the English language and become competent in using technology because English and technological skills are likely to be advantageous in their careers. These EFL teachers expose their students to up-to-date technologies so they can apply these skills outside the classroom. In addition, they also set limits on how students should use technology, in order to consider the influence of religion and properly align it with the interests of both teachers and students.

c) Teachers who reject teaching Western culture alongside the English language

The last type of EFL teachers represented among the interviewees is those teachers who rejected the idea of teaching Western culture with the English language. These people can be classified as conservative; they want to promote only their own culture within schools. This group has a negative perception of Western culture. They believe that teaching English affects the Arabic language negatively and reduces the identification of students with their native culture.

These EFL teachers were bitter, critical and resentful towards teaching English. More often than not, these interviewees had no choice but to become EFL teachers because they were unable to find a government job or a position working in their chosen discipline. Being an EFL teacher is a highly paid job in Saudi Arabia.

Even if this situation applies to few EFL teachers, these negative attitudes can greatly impact students' perceptions of the English language and Western culture.

This type of EFL teacher rejects innovations in instructional tools. They believe in traditional teaching styles and believe that the learning ability of students will always be the same regardless of their environment. EFL teachers located in this group tend to maintain the status quo.

#### **5.2.5.1 Summary – Cultural aspects of teaching English with technology**

This classification of EFL teachers demonstrates large differences in perspectives on teaching English and using technology. The manner in which they deal with Western culture and technological tools influences their capacity to apply teaching strategies. These different approaches allow students to acquire specific skills in the English language and familiarisation with technological tools in an appropriate cultural context.

#### **5.3.6 Overall interview outcomes**

Most of the interviewed EFL teachers were highly willing to use technology in the classroom, as they understand the significance and benefits of technology. The interview outcomes demonstrated that most of the teachers believe that communication using visual aids was important, which permits more effective EFL teaching. This is also true for the use of technology within classrooms in order to obtain and share information. Interview data show that teachers also access various online tools, such as dictionaries, in order to verify the information they deliver. Furthermore, most of the interviewed EFL teachers think that students should have

access to technology and believe that students enjoy using technology in their classrooms.

Mixed responses were obtained when the teachers were asked whether they prepared semester-length plans that include the use of technology in the classroom. The interviews highlighted that some interviewees think that technology interferes with their teaching, while others think that it increases student knowledge and teaching effectiveness. Teachers who were willing to use technology reported using multiple tools for evaluating students, while teachers who were unwilling did not.

When EFL teachers were asked whether they had extensive experience in practising the English language in Western society, different responses were obtained. Similar responses were obtained when the teachers were asked whether they prepared semester-length plans that included the use of technology in the classroom and whether they believe that students will learn more if technologies are used in the classroom. Some interviewees believed that technology tends to indulge students by offering various other activities that might be irrelevant to the subject.

The interview results suggest that EFL teachers working in Saudi Arabia consider the use of technology to be beneficial for students as well as teachers. Teachers were generally willing to use technology in their classrooms, as it helps engage students, allows teachers to share information efficiently, helps them to teach students using various interactive tools and software and enables students to access a wide range of information.

## 5.4 SUMMARY

In conclusion, the surveyed EFL teachers were categorized into three groups based on their transcripts. The first category of EFL teachers exhibits positive attitudes towards technology as well as high levels of competence in teaching EFL to students. Four EFL teachers stand as role models, since they have great willingness to learn about adapt new technologies and apply them in the classroom to teach others. If such teachers take more classes, the quality of education will improve.

The second category of EFL teachers also exhibits positive attitudes towards technology in teaching. They are interested in using technology to teach English in their classrooms, but they lack the confidence and competence to apply these techniques. Three of the interviewed teachers exhibit this pattern. These teachers could be empowered to use technology in their classroom in the future through proper training, since they are open to learning and ready to improve their skill sets.

The third category of EFL teachers possesses the skills to use technology for teaching the English language, but they are not interested in using technology in their classrooms. Three of the surveyed EFL teachers exhibited this attitude. Though they were aware of the value of technology, they were unwilling to use it in their classrooms. These EFL teachers could be required to use technology in their classrooms in order to impart effective English language classes, but use of technology would be unlikely to produce good outcomes unless they received some sort of counselling or intervention to overcome their attitude problems. These

teachers need to understand the importance of technology for English teaching in order to bring out the best in them and their students.

The interview outcome provides a relevant exploration of the crucial role of technology in the English language classroom. Teaching EFL emerges as a complicated, multidimensional educational activity that requires significant knowledge, preparation and training in various technological applications and approaches in order to carry appropriate instruction to students. Awareness of the cultural aspects and influence in teaching English in Saudi Arabia has progressively increased.

Finally, all but two teachers either have an interest in using technology in their classrooms for teaching EFL or are already doing so. Only two teachers did not possess the adequate skills to use technologies for teaching English and were not willing to do so.

## CHAPTER SIX

### Discussion

The topic studied in this research project was the current state of pedagogical use of technology in English language classrooms in Saudi Arabia. The study sought to be representative of all EFL teachers working in Saudi Arabian technical colleges, which support and encourage the pedagogical use of technology in teaching EFL. As previously clarified, the purpose of the study is to investigate the perception of EFL teachers' use of technology to support learning, to explore EFL teachers' willingness to use technology to enhance learning outcomes and to determine EFL teachers' perceptions of TPACK. In this discussion chapter, important aspects and interpretations of the research findings are presented, along with the specific implications and limitations of the study.

#### **6.1 THE RESEARCH QUESTIONS - FINDINGS**

This section described the findings relevant to the study's nine research questions. They are presented below as parts of discussion of results relating to the three dimensions of the study – use of technology to support learning, willingness to use technology to support learning and TPACK.

##### **6.1.1 Use of technology to support learning**

The researcher sought to investigate the use of technology to support EFL learning by focusing on three key aspects: EFL teachers' perceptions of use of technology, the relationship between EFL teachers' perceptions of use of technology in teaching and their perception of TPACK, and factors affecting the perception of



EFL teachers' use of technology in teaching. Three questions guided the research with respect to each aspect.

The mean score for the use of technology to support learning in the online survey was 2.44 with standard deviation of 0.74. The items were conclusive and covered the use of technology aspects required in the learning process. EFL teachers recognised the need for technology to be incorporated into their learning, as it opened up the possibility of numerous learning experiences that would have been impossible without the use of technology in the classroom.

The mean score and standard deviation for the use of technology to support learning gave an overview of the extent to which technology was incorporated in the learning process. The mean score for the use of technology to support learning (2.44) was considered reasonable and compelling from an analyst's perspective, since it had a positive mean (Cooksey, 2007). However, there were complicated survey items that resulted in better scores than expected.

The average mean score and standard deviation indicated that there were certain areas in which teachers believed that the use of technology was not a recommended course of action in learning. The development of web pages, multimedia, engaging in virtual worlds and simulations were slightly more complicated and required specific software and hardware. EFL teachers were unable to interact with the aforementioned technology tools because of the lack of training in these advanced tools. Moreover, whenever EFL teachers were engaged with these applications, they tended to be more competitive.

One of the major issues for some EFL teachers was their rejection of the idea of the use of technology, which was a subject of debate because there was a demand for the traditional way of learning. A small number of these teachers argued that the traditional way of teaching was the preferred method of learning. As such, some of them did not believe that technology use should take over traditional learning methods.

The average mean score supported the idea that in some cases, the use of technology was debatable, particularly in terms of deciding the best way to provide teachers with technological tools for effective classroom teaching (Quillen, 2012). Technology use gave EFL teachers greater independence in the learning process; because it was an interactive learning experience, teachers were motivated and maintained a positive attitude towards the learning process.

#### 1) Discussion of research question one

Analysis of data from the online survey implies that EFL teachers working in Saudi Arabian technical colleges utilise multiple technological tools to support learning. The creation of graphics in software such as Paint means that EFL teachers are concerned with turning technology into a powerful instrument for enhancing the learning process. Individuals should note that the perception of use of technology is relatively high in Saudi Arabia, considering the universality of technology in today's dynamic society and education (Ilter, 2009). The perception of technology use demonstrated in the research data illustrates that EFL teachers in Saudi Arabia have the technological capacity to communicate effectively with students and other

stakeholders in the educational process. The perception of use of technology by EFL teachers in Saudi Arabia and the feelings of EFL teachers regarding the implementation of technology in the EFL classroom reflect a persistent need for educational and technological reforms.

The study confirmed that EFL teachers in Saudi Arabia are generally willing to use technology in teaching, and that teachers' perceptions of technology use was positive, as expected. The online survey showed that the majority of participants (91%) concurred with the statement that teachers make widespread use of word-processing software with students in their EFL classrooms. Similarly, a large majority of participants (92.4%) indicated that teachers commonly use PowerPoint presentations to support learning in their EFL classrooms. This finding is in agreement with the work of Pierson (2001), who found that PowerPoint was the most frequently used MS software for lesson presentation .

A bare majority (51.9%) of surveyed EFL teachers concurred with the use of graphics in the classroom. However, a higher proportion of the participants were happy to use electronic text-based communication, with 76.9% reporting that they employed communication by chat and email in their EFL classes. A majority (61.5%) of participants concurred with the use of communication methods such as Skype and videoconferencing. Skype, videoconferencing, chat and email are internet-based services; hence, it was important to examine internet access of the Saudi teachers. Analytically, Jack and Theodore (2001) state that Skype, videoconferencing, chat and emails are internet-based services, hence an examination on internet accessibility level among the Saudi teachers was quite imperative.

A large majority (96.1%) of participants reported using the Internet to gather information, in line with Simpson (2010), who noted that information obtained online can facilitate teaching and widen students' thinking. Accessing the Internet in and of itself would be ineffective if users had inadequate knowledge of online tools (Hubbard 2003). However, this study showed that the vast majority of the Saudi EFL teachers (95.9%) in the survey used online tools such as dictionaries, translators and thesauruses to support learning in their EFL classrooms.

The use of educational software in the classroom was common: 68.4% of participants supported the use of educational software (both online and on CD-ROM) to support learning in their EFL classrooms. The use of such software helps EFL teachers to use and teach correct pronunciation, as they and their students can listen and watch English words being pronounced and written (Psaroudaki & McKay, 2008), which would help EFL teachers evade pronunciation problems while teaching.

Most of the participants (58.9%) were not in favour of using mapping concepts in the classroom. Similarly, a majority of participants (61.6%) did not support developing web pages or using multimedia (60.3%) in the classroom. In addition, 62.8% were not in favour of engaging in virtual world simulations. These negative responses could be associated with the high level of involvement that mapping and webpage development require (Naphthine, 2006), which are major challenges to their use in the classroom. In this line of argument, these challenges stem from negative attitudes that both students and teachers develop towards technological use in classroom (Wiebe & Kabata, 2010)

## 2) Discussion of research question two

The relationship between EFL teachers' use of technology in teaching and their TPACK was positive and identical. The correlation coefficient between use of technology and TPACK was 0.51, which was positive and statistically significant. Each increase in the use of technology equal by an increase in TPACK. The beta coefficients between use of technology and TPACK were positive and significant. EFL teachers' overall use of technology positively correlated with their pedagogical practice in an active, technology-based learning environment (Alshumaimeri & Almasri, 2012). Most of the EFL teachers participating in this study displayed an adequate understanding of the three interrelated components in their daily practice: technology, pedagogy and content. Most of the teachers demonstrated an ability to negotiate similar relationships in an efficient manner. Their perception of TPACK shows that they implement a valuable organisational structure to define the aspects they need to know while integrating technology into the EFL classroom.

The dimensions of PK manifested in the EFL teachers participating in the study indicated sufficient preparation in traditional teaching methods and strategies. Marotta and Hargis (2011) showed similar findings for mathematics teachers. However, EFL teachers from younger generations were more confident in using new and creative methods of teaching compared to teachers from older generations. The EFL teachers' perceptions of PCK were identified as satisfactory because they succeeded in combining the elements of pedagogy with content in an effective way. However, similar combinations in the areas of TCK, TPK and TPACK

appear insufficient (Fahad, 2011). EFL teachers need to be offered additional training opportunities to refine the previously indicated elements of knowledge.

In terms of TK, most of the surveyed EFL teachers demonstrated substantial technology expertise in using digital technologies such as the Internet, relevant software applications and laptops (Liton, 2012). The extent of PK manifested by the teachers participating in the study indicated sufficient preparation in traditional teaching methods and strategies. However, the research indicated that younger EFL teachers were more confident in using new and creative methods of teaching than teachers from older generations. In addition, the EFL teachers' overall perception of PCK was identified as satisfactory because they succeeded in combining the elements of pedagogy with content in an effective way.

### 3) Discussion of research question three

While EFL teachers in Saudi Arabia generally appeared to be willing to use technology in teaching, the perception of use of technology is not as widespread as might be expected. The regression model used in this study shows that the most persistent factor significantly associated with technology use was PCK. The participants in the present study recognised the intersection of pedagogy and content; most could adequately present the subject matter through technology and could understand students' conceptions about that subject and other dimensions of learning (Mahdi & Naim, 2012). From the teachers' answers to the questions in the online survey and the interview, the researcher concluded that PCK is extensively rooted in the teachers' daily work. In addition, the personal teaching backgrounds

of the EFL teachers and the specific working context powerfully shape their perception of use of technology in teaching.

TK, TPCK and PK were negatively associated with the use of technology for teaching purposes, but a similar effect was not significant. The EFL teachers could not sufficiently expand upon the concept of TK in the sense that they did not show solid knowledge of practical ways to alter the purpose of certain technologies used in the teaching and learning process (Cimermanova, 2011). TPACK was negatively associated with the teachers' perceptions of use of technology in teaching, as EFL teachers failed to focus on the complex relationships associated with this framework in terms of interactions among teachers, technology and content. Likewise, PK was negatively associated with using technology in teaching because the teachers focused on practices in the educational field rather than considering more opportunities for practice.

Findings from the interviews support the above results: the level of TK was wanting among the participating EFL teachers. It is clear that virtual worlds were new concepts for most of the EFL teachers surveyed. Five EFL teachers reported having the opportunity to read about virtual worlds; some of those teachers had the chance to self-train themselves.

Technical colleges in Saudi Arabia do not train their teachers on the use of virtual worlds; therefore, it was understandable that there was variation in the results relating to EFL teachers' use of virtual worlds. Ali said, *"Whatever the virtual world, there is no time to use it because I must complete the curriculum that does not*

*include such a thing*". Similarly, as part of a discussion about teaching innovations, including virtual worlds. Majed said, *"due to the hectic routines, the brain gets saturated."*

It is very important for EFL teachers to be involved in a range of activities that involve the use of technology. For example, online gaming is very popular with students, so incorporating it into teaching English is another way to develop and maintain student interest. Moreover, most online games use English, so involving the students in online games can help them to develop their English language knowledge.

In this research, EFL teachers involved with online activities were more likely to develop innovative activities within the classroom. Omar explained, *"the process of using these activities is not as popular among the students as it supposed to be."* Moreover, most teachers were not willing to use these technologies, and the TVTC administration did not offer teachers any professional development with respect to gaming and other virtual digital activities.

The participants' responses show that the mean level of TCK is high. The respondents used internet access and internet tools in order to support learning, explaining that the Internet or online tools could be used to find information and develop teaching method.

According to the EFL teachers' responses, accessing online tools like dictionaries, translators and thesauruses helped students to learn the English language. The majority of the respondents agreed that it is easier for students to



understand information or knowledge in their native language; therefore, dictionaries and translators were important tools, helping to develop the students' understanding of the information they gathered.

The process of learning is highly influenced by the use of technology tools. Tools like a dictionary and translators are known to speed up the process of learning by providing essential knowledge. Respondents reported that they liked the ease of access to online tools and thus used them extensively.

The majority of the respondents explained that technology tools provide many options for learning purposes. As the process of learning involves many components, and understanding the content is one of the most important, technology tools that increase students' ability to understand content can help EFL teachers at all levels and stages of teaching. These findings agree with those of Ward and Parr (2010), who asserted that teachers' motivation to use information technology was increasing because of the practical advantages that it brought to their classes.

### **6.1.2 Willingness to use technology to support learning**

The researcher sought to investigate the willingness to use technology to support EFL learning by focusing on three key aspects: teachers' willingness to use technology, relationship between EFL teachers' perceptions of willingness to use technology in teaching and their perceptions of TPACK, all factors affecting the perception of EFL teachers' willingness to use technology in teaching. Three questions guided the research in light of each aspect.

Teachers' willingness to engage with technological innovation was linked to the attitude they held towards their professional roles. In the online survey, attitude showed a mean score of 1.21 with standard deviation of 0.43. The mean score was the lowest among willingness components, indicating that it was the least influential component of teachers' willingness to use technology in learning. However, the mean score still showed a positive correlation between teachers' attitudes and technology use. One interpretation of this positive correlation is that, in mainstream society, teachers are expected to possess much knowledge that they pass on to learners. EFL teachers' knowledge exercise implies that, even with technological advancement, teachers must make an effort to uphold their relevance.

Another component of teachers' willingness that influences the extent of technology use was anxiety. The anxiety influence showed a high average mean score of 1.64 with standard deviation of 0.97. Anxiety was largely attributable to EFL teachers' fear of embarrassment in the presence of colleagues and students, loss of status and insufficient professional skills. In this case, anxiety implies that EFL teachers who lack confidence in their technological proficiency have a lower likelihood of applying it, since it poses a threat to their sense of competence.

The high willingness of teachers to use technology as a teaching instrument could also be attributable to their self-efficacy. The significance of self-efficacy in influencing technology use was clearly shown by its relatively high mean score of 1.40 with standard deviation of 0.72. Evidently, teachers appreciate the devices' capacity to activate and heighten senses of touch, sight and hearing, which are crucial to learning. Further, these technological advances have the capacity to

provide interactive potential for users, thus developing their creative and intellectual abilities, which make learning easier.

The fourth component of willingness examined in the online survey was motivation, which had a mean score of 1.27 with standard deviation of 0.48. This mean score and standard deviation depicts a positive relationship between motivation and use of technology. Teachers' motivation to learn and apply technology in their classroom was related to the manner in which they were involved in professional development. Teachers strive to establish a useful, rewarding and relevant teaching practice while improving the learning process. Willingness to use technology as a teaching aid could also be attributable to the teachers' enthusiasm for revolutionising education. The availability of digital technologies has not only transformed economic, social and cultural societal landscapes, but it has also change EFL teachers' vision of education.

The final willingness component was goal-setting, which obtained the highest mean score at 2.10 with standard deviation of 1.08. Goal-setting was the most influential component of teachers' willingness to use technology in their practice. Teachers who aspire to gain technological knowledge by taking courses or getting involved in training programs indicate a higher disposition to adopt technology. Goal-setting enhances teachers' self-efficacy, expands their technological proficiency and minimises anxiety levels.

Teachers who participated in the online survey showed high willingness to use technology in support of learning, as shown by the overall mean score of 1.5

with overall standard deviation of 0.51. This willingness score clearly shows that teachers' attitudes, anxiety, self-efficacy, motivation and goal-setting correlate with their teaching practice and willingness to use technology to support learning.

#### 4) Discussion of research question four

Most of the EFL teachers working in technical colleges in Saudi Arabia are willing to use technology to support learning. As long as the level of agreement for the constructs is 1.5, this implies that the EFL teachers were willing and enthusiastic to implement technology in their pedagogical instruction. Most surveyed teachers shared a belief that students need access to technology in every EFL classroom in Saudi Arabia. In fact, the willingness of the EFL teachers to use technology corresponded with their perception that students need to increase their knowledge of the English language. From this perspective, technology integration obviously supports learning because it enables teachers to transfer important information to students in an effective manner (Abdallah, 2011).

In achieving educational goals via technology use, both students and their teachers need to enjoy using the available technology, as enjoyment improves self-efficacy (Ottenbreit-Leftwich, Glazewski, Newby & Ertmer, 2010). In this study, 94.7% of respondents reported that they enjoyed using digital technology in the classroom, and 96% agreed that students would learn more if digital technologies were used in the classroom. These findings suggest that these Saudi EFL teachers enjoyed using technology at least in part because they recognise that students will learn more in the classroom. The rationale for high levels of willingness to use technology in the

classroom echoes the work of Mumtaz (2000), who claimed that willingness to use technology in classroom ensures that students have increased access to information despite cost, time and convenience limitations. It is also probable that the enjoyment derived from the use of technology in the classroom is attributable to its flexibility in supporting various teaching methodologies and approaches. For instance, it becomes joyous when students are able to hear and see target language through audiovisual teaching techniques (Mumtaz, 2000).

Another perspective on this subject is that willingness to use technology is related to its ability to simplify teaching (Neri, et al., 2008). A large majority of participants (95.9%) reported that they wanted to use technology in the classroom to make teaching simpler and thus allowing students to remain focused and concentrate more easily, thereby reducing the boredom sometimes associated with manual teaching (Chawla & Mittal, 2013). Like Chawla and Mittal (2013), this study found that a high proportion (88%) of participants were anxious to use technology to facilitate teaching so to avoid boredom in the classroom.

Over three-quarters of the respondents (76.7%) believed that the use of technology would not interfere with teaching in any way. This finding directly contradicts the claim of Yaghi and Abu-Saba (2007), who argued that using technology in the classroom would interfere with teaching process and students' concentration. However, this study's finding aligns with that of Al-Asmari (2005), which technology use will help in promoting learning processes and activities rather than causing interference. Logically, technology's effectiveness in promoting learning processes and activities must contribute to greater willingness to use it,

which explains why the majority of respondents (87.5%) in this study did not feel nervous about using technology while teaching. Ali (one of the interviewees) said, *"It is difficult to maintain the students' attention when using technology."* These responses are supported by Jawahar and Elango (2001), who point out that teachers could have a positive attitude in using technology for their own personal objectives but would not be willing to implement it in their work. Furthermore, teachers did not think that students should have access to technology in the classroom. He believed that using technology does not support learning in an effective manner.

Digital technology is advancing ceaselessly in every market, including the education sector (Rashed, 2008). Thus, as Rashed (2008) suggests, it is imperative for technology users – in this case, EFL teachers – to be adaptable and to adopt these emerging applications. In this study, a large majority of participants (95.9%) considered themselves to be efficient with respect to learning new software and tools on the computer.

The high level of self-efficacy exhibited by these Saudi EFL teachers was reflected in and related to their confidence about using technology in the classroom, as previously mentioned by Kuo (2008) and Stepp-Greany (2002). Over 90% of participants were confident about using technology for teaching. Given that a teacher is the most crucial element of the student's learning environment (Stepp-Greany, 2002), EFL teachers who are not confident would find it very hard to help their students learn (Stepp-Greany, 2002).

In examining the motivational component of teachers' willingness to use technology in the classroom, this study produced various useful findings. A large majority of participants (95.9%) thought that using technology in the classroom made teaching more interesting, thus improving student learning (Salaberry, 2010). In addition, 98.6% of participants in this study expressed their desire and intention to find new and interesting ways of using technology in the classroom, indicating that they are self-driven in the use of technology (Otto & Pusack, 2009). Accordingly, most participants (76.4%) reported that they prepared short lesson plans in relation to technology. Hence, it can be reasoned that Saudi EFL teachers are not only self-motivated to develop student's language skills but also their own technological skills. In the view of Courey, Tappe, Siker and LePage (2013), short lesson plans enable students to master skills more rapidly than in long lesson plans, which could bore them and reduce their concentration. Therefore, the surveyed EFL teachers were on the right track to achieve the best possible short-term learning goals at all levels of pedagogical use of technology in the classroom.

The study found that EFL teachers included the use of technology in their semester-length plans. Such long-term plans would improve students' learning outcomes, since they become physically and psychologically prepared for the lessons (Epstein, 2013). Not only did they prepare long-term plans, but a majority of participants (69.3%) also prepared plans that included new and interesting ways to use technology in the classroom. This can be seen as a pedagogical strategy for motivating students to concentrate during lessons.

## 5) Discussion of research question five

The relationship between the EFL teachers' perceptions of willingness to use technology in teaching and their perception of TPACK was positive and significant. The correlation coefficient between Willingness and TPAK was 0.72, which was statistically significant. The EFL teachers considered their perception of TPACK sufficient to conduct different teaching practices in the EFL classroom. Possessing a high willingness to motivate students to learn was an essential part of the explored relationship. In the researcher's view, the specificity and orientation of technical colleges in Saudi Arabia additionally enhances EFL teachers' perceptions of willingness to use technology in teaching. Moreover, the teachers participating in the study were confident in their willingness and motivation when using technology for teaching purposes (Quillen, 2012). The focus on diversity and developing students' interests was at the core of the relationship between the EFL teachers' perceptions of willingness to use technology and their perception of TPACK.

Undoubtedly, teachers who are confident in their perception of TPACK made substantial efforts to teach more efficiently and reliably with the use of different technological platforms. Teachers perceived they had a responsibility to ensure adequate opportunities for teaching the English language. That considered as in an attempt to optimise students' outcomes associated with studying and mastering the English language in the social and cultural context of Saudi Arabia. The EFL teachers' high perception of TPACK implies that they persistently worked in a positive direction to develop students' concentration in learning (Semiz & Ince,



2012). For that reason, the expected outcomes refer to the ongoing engagement of students in different learning tasks as well as decreasing behavioural problems in the classroom.

These results relating to TPACK are supported by the findings of analysis of interview data; the teachers perceived that students would learn more if digital technologies were used in classrooms. For some of the teachers, this belief was due to the fact that they believed students enjoyed using technology in the classrooms so they would be keener to obtain information and seek knowledge through digital technology. Other teachers believed that students could use technology to learn new concepts and increase their English-language skills, such as pronunciation and reading skills.

The EFL teachers believed that using different tools of communication allowed students to share information easily. Using technology in the classroom meant students could learn even when they were using their PCs and laptops at home, with online communication tools, assessment tasks and resources available online. Furthermore, teachers stated that students rapidly become comfortable with the frequent use of technology and that using technology increases their general knowledge. These responses support previous statements by Khorrami-Arani (2001), who asserted that self-efficacy in computer knowledge is determined by positive attitudes. Thus it is very critical to determine whether teachers are willing or not willing to use computer technology in their classes (Allan & Ma, 2001). By contrast, government efforts to equip schools with laboratories and computers was terminated due to a shortage of trained staff and teachers (Alshumaimeri, 2008).

A minority of the surveyed EFL teachers reported their belief that students will not be able to learn if technology is used in the classroom. According to their responses, teachers who integrate digital technology into their lessons would not be able to control the students or the type of information accessed in the classroom. Furthermore, some feared that they would lack the leadership skills which would be required in effective maintenance of technology use. This finding agrees with that of McNierney (2004), who pointed out that teachers' unwillingness to experiment with new teaching technologies could stem from fear of not being competent enough to cope with emerging strategies in a learning environment. Similarly, Yaghi and Abu-Saba (2007) added that some teachers fear that the use of technology would shift the focus of students from the subject of study to the technology.

#### 6) Discussion of research question six

TPACK was significantly associated with the EFL teachers' willingness to use technology in teaching. TCK, CK and PK were negatively but non-significantly associated with willingness. The high willingness of some of the EFL teachers to use technology in teaching could be explained with the innovative approach they adopt in terms of language instruction because they support the idea of creating a student-centred and a technology-based learning environment (Alshumaimeri & Almasri, 2012). Nevertheless, other teachers participating in the study indicated that utilising traditional teaching methods in the EFL classroom was more effective because students' attention and concentration tended to diminish while using technology.

The researcher found that TCK had a negative effect on the teachers' willingness to adopt different technological tools and strategies in teaching. The surveyed EFL teachers failed to understand the specific way in which the subject matter of EFL could be changed by the application of certain technologies. Although CK is of crucial importance for EFL teachers based in Saudi Arabia, these teachers consider that students may receive incorrect information and develop misconceptions in the content area through the use of digital technology (Ilter, 2009). When it comes to PK, it was observed that teachers who demonstrated extensive willingness to use technology in teaching but had restricted access to technology still tended to use technology in the classroom. Nevertheless, the lack of sufficient pedagogical knowledge as well as technology knowledge and training had a negative effect on the EFL teachers' willingness to use technology in the classroom.

### **6.1.3 TPACK**

The researcher sought to investigate EFL teachers' perceptions of TPACK by focusing on three key aspects: the level of TPACK for EFL teachers, the relationship between EFL teachers' level of TPK, TCK, PCK and their level of TPACK and factors affecting the level of EFL teachers' TPACK. Three questions guided the research in light of each aspect.

The TPACK mean score (1.7) with standard deviation of (0.44) showed a high level of agreement with TPACK components. The means score representative of a highly satisfied teaching corporation concerning TPACK in the learning process.

The mean scale score similarity (1.50) between the technology knowledge and technological content knowledge might raise the issue of how different they are (Dalkir, 2013). In perspective, the term “content” makes all the difference, as it brings out skill in the technology and its application in the daily English content instructional techniques. The technology knowledge is more central than technological content knowledge. For instance, knowing how to operate and use a desktop computer does not necessarily have the same weight as being familiar with its applications and knowing how to effectively use them in a classroom situation.

Content knowledge had a notably high satisfaction indicator (mean = 1.95; SD = 0.63). The mean score showed that the teachers were extremely satisfied with the way EFL was incorporated. However, content knowledge in itself is rather general. It covers the general knowledge of the content involved in the technological pedagogical content knowledge as a single piece of knowledge or first level of knowledge. As much as TPACK is a capable framework as a single-standing knowledge, the fact that it incorporates other individual knowledge ensures that it can be taken apart and encountered separately.

It was interesting to note that the other high-ranking mean scale score (1.91; SD = 0.64) also related to content knowledge in combination with pedagogy knowledge. The mean score and standard deviation for PCK can be interpreted to mean that teachers place a great deal of emphasis on internalising the content knowledge component of TPACK. TPK had a mean score of 1.64 with standard deviation of 0.79 as an independent second level of knowledge. The mean score

dictates the view that, on a general scale, teacher's perceived technology and instructional standards similar to the basic education distribution.

It is worth noting, first, that all seven TPACK components have a positive mean score, including the overall TPACK mean scale score. The positive mean score reflects a very good perception of the entire (and individual) TPACK component(s). However, technology knowledge had the lowest mean score. Even though it was both positive and high, in comparison to the other components, technology knowledge and technological content knowledge were ranked last. The scale score revealed that technology could be essential in the development of other areas, as well as pedagogy and content.

#### 7) Discussion of research question seven

The EFL teachers that demonstrated high willingness to implement technology in the EFL classroom used various software applications to assess their students. The high availability of technology in Saudi Arabian technical colleges means that EFL teachers are interested in providing a flexible and reinforcing learning environment in which students succeed. For instance, EFL teachers use PowerPoint, Word, Excel and other computer applications to enhance students' outcomes. The perception of TPACK for EFL teachers in Saudi Arabia is adequate as they ensure a relevant understanding of the fundamental role of technology in the teaching process.

The researcher found variety of responses from the EFL teachers regarding teaching and assessment practices, especially for those with low willingness to use

technology in teaching. The fact that the technical colleges in Saudi Arabia invest substantially in using different technological tools is indicative of the EFL teachers' perceptions of TPACK and willingness to implement technology in the classroom. The lack of a proper understanding of how to use different technologies in teaching emerges as a significant impediment to teachers' progress towards increasing their perception of TPACK (Semiz & Ince, 2012). This indicates that EFL teachers in Saudi Arabia need further training and professional development opportunities to help them attain greater competence in utilising various technological tools in teaching. A significant finding in this study that has practical implications in the field is that EFL teachers with an extensive experience in practising English language in a Western society have a higher perception of TPACK than teachers lacking such an experience.

The findings outlined above are supported by the data from the interviews; EFL teachers were willing to use and actually using a variety of software for evaluating their students. These EFL teachers use PowerPoint, Word and Excel and ask students to submit their assignments and give presentations using these software packages.

Teachers' use of technology not only motivates students to seek information but also increases their habits of reading, writing and improving their communication skills. EFL teachers can use technology to assess the understanding of the students, their writing skills, communication skills and listening skills. Furthermore, technology also helps in quickly responding and providing assistance to the students about their performance within the classroom. These assertions

reflect the outcomes of earlier research by Wiebe and Kabata (2010), who asserted that most teachers perceive that the use of technology in classes enhances the learning of language and that it has the ability to expose students to real-life situations in which their capacity to effectively use the language can be developed.

On the other hand, some of the surveyed EFL teachers made little or no use of software in evaluating their students. Ali stated that his only interaction with digital technology was to load the final marks to the computer system. This and similar statements were due to the low willingness to use technology on the part of some teachers. These are EFL teachers who are not willing to hold themselves back because of the inconsistencies of their teaching and assessment.

Another reason for some EFL teachers' minimal use of technology was that even if they were willing to use various technological tools, they did not have a proper understanding of how to use them. Wiebe and Kabata (2010) argued in a similar vein that despite the merits of technology there is a particular cohort of teachers who have the perception that implementing a technological environment would require the input of skills that they lacked, while another cohort believes that a technological educational environment would not generate more effective learning outcomes or add instructional value of great significance.

When the EFL teachers were asked whether they had considered using technology in the classroom interfered with their teaching, three teachers agreed. These teachers believed that with the use of technology in classrooms they tended to lose control and were unable to monitor students effectively. Many of the

surveyed EFL teachers were not highly skilled in the use of digital technology, which led them to resist technology integration. They were more comfortable with traditional teaching styles that (they believed) allowed them to monitor and assess students effectively. However, Schmid (2010) warned that while teachers with traditional teaching styles may be in possession of suitable attitude and the prior knowledge required to implement lessons via their TPACK, this is not adequate to function effectively in a computer-assisted learning environment. Schmid wrote that modern teachers are required to know how to use technology to generate better learning outcomes and strengthen learning experiences.

In the research presented in this thesis, a very large majority of EFL teachers (91%) did not think that using technology in classrooms interfered with their teaching. Instead, they believed that technology provided them with a platform through which they could conduct their lessons more effectively. Consequently, the perception of TPACK for EFL teachers in Saudi Arabia is sufficient as they implementing technology in their English language classrooms.

#### 8) Discussion of research question eight

Most of the EFL teachers participating in the study demonstrated an essential belief that they are adequately aware of the strategies they adopt in assessing students' performance in the classroom ( $TPK = .81$ ,  $TCK = .74$ ,  $PCK = .68$ ,  $p < .05$ ). In fact, most EFL teachers in Saudi Arabia improve their assessment procedures through technology. Creative teachers who used technology extensively in the EFL classroom indicate that their perception of TPACK is the basis for efficient and



reliable teaching with technology (Semiz & Ince, 2012). Nevertheless, no technological strategy or solution can be applied for all EFL teachers in Saudi Arabia. In fact, different technological solutions are needed to take account for the range of ability of these teachers to navigate and maintain the elements of technology, pedagogy and content.

The relationship between the EFL teachers' perceptions of TPK, TCK, PCK and their perception of TPACK is found to be unpredictable and systematic considering lacking knowledge in technology, experience and willingness to use technology in teaching on behalf of some EFL teachers in Saudi Arabia. The interviewed EFL teachers persistently ignored the complexity pertaining to each of the components of the TPACK framework. Such teachers are likely to present ineffective and oversimplified solutions in terms of technology (Yamauchi, 2009). The EFL teachers in Saudi Arabian technical colleges are expected to develop fluency and flexibility in TPACK for teaching purposes.

The findings presented above are supported by results from that indicated teachers believe in the importance of technology in EFL teaching. They believe that it helps in enhancing communication between the teacher and the students. Technology also helps EFL teachers to properly communicate their English language message and support their knowledge with English content available online. Technology integration allows EFL teachers to access online English dictionaries for obtaining meanings of words, listen to the audio pronunciations of words and provide students with recorded conversations for improving their listening as well as speaking skills. According to the interviewees, technology not

only helps the students but also helps the EFL teachers in increasing their vocabulary and improving their English language. Many useful exercises are available online for EFL teachers to use in the classroom for practice. Teachers do not just grab the attention of EFL students but also develop their interest in spending more time on learning English.

EFL teachers who reported a preference for the traditional ways of teaching English were using grammar books and other English language books. Al-Maini (2008) asserted that while some teachers in Saudi Arabia were teaching with textbooks and others persistently resisted technology, rapid change was occurring due to students becoming bored with the traditional methods of teaching. According to Harris, et al. (Harris, et al., 2009) those teachers do not realise that the technology is already within their reach and they are in the best position to incorporate this technology into their classrooms.

#### 9) Discussion of research question nine

TK, TPK, TCK, TPACK, CK, PK and PCK were factors significantly associated with EFL teachers' TPACK. Analysis of the interviews illustrated different views and perspectives associated with EFL teachers' perceptions of TPACK. The mentioned factors are interrelated and significantly affect the perception of TPACK of the EFL teachers. Most of the EFL teachers participating in the study believed technology could play a useful part in the development of EFL instruction in Saudi Arabia. Nonetheless, some of the participants contended that particular content could significantly limit the technologies they tend to implement

in the EFL classroom. Technology can negatively affect specific representations of language assessment procedures for students, but at the same time, it can contribute to the establishment of new, diverse and creative technological representations (Liton, 2012). EFL teachers working in Saudi Arabia need additional training to make them more efficient and productive. This research demonstrated that the perception of the teachers' TPACK corresponds to their preparedness and willingness to implement technology in the teaching process. However, some of the EFL teachers still feel they lack competence and are unsure of the strategies necessary to develop and maintain a technology-based learning environment.

The findings presented above are supported by results from the interviews, which indicated that EFL teachers found to have extensive experience in practising English language in the West were also highly willing to use technology within the classroom. As they tend to have a better understanding of English, they are confident that they can teach EFL in new and innovative ways. These teachers have seen students in Western society using technology for academic purposes, and hence understand the importance and benefits of using technology to learn English. In contrast, there were some teachers who had not much experience in practising English language in Western societies, largely due to their own religious beliefs and cultural factors. It is unfortunate that their sidelining of Western culture has had a negative impact on their education.

All surveyed EFL teachers stated that they knew how to assess students' performance in the classroom. The majority of EFL teachers believed that teachers improve their assessment and modify the approach of their teaching via student

assessment. The EFL teachers agreed that the assessment methods most suitable to guide student learning of English were tests, writing assignments, quizzes and pronunciation competitions in classrooms. Lambert et al. (2008) Lambert et al. (2008) went on to propose a technology course for pre-service teachers that would prepare them to adapt to the changing technological strategies in teaching. Teachers who are either willing or unwilling to use technology should have access to different technological tools through which they can evaluate their students.

## **6.2 PARTICIPANTS' PERCEPTION OF USE OF TECHNOLOGY TO SUPPORT LEARNING**

Most of the EFL teachers demonstrated substantial technological expertise in terms of using technologies such as the Internet, computer software and hardware (Liton, 2012). EFL teachers use visual communication technologies such as Skype and videoconferencing to optimise learning outcomes. Initiating communication with visuals is useful while generating quite authentic learning materials, and thus individuals can be more confident and productive in their educational interactions. Nevertheless, some of the teachers participating in the study expressed negative beliefs pertaining to the utilisation of technology for educational purposes. They perceived that use of technology in the classroom to be highly inappropriate, believing that it creates passive students who relied on predetermined modes of learning (Yamauchi, 2009).

### **6.3 PARTICIPANTS' PERCEPTION OF WILLINGNESS TO USE TECHNOLOGY TO SUPPORT LEARNING**

It has been shown that the use of technology in the EFL classroom contributes to better, open communication at various perceptions within the educational environment. The teachers' willingness to use technology in their teaching corresponded to their strong determination to provide significant opportunities to students for verifying specific information and data. The willingness of the EFL teachers to utilise technology for teaching purposes demonstrated their intention to introduce a relevant, efficient, flexible platform that enabled learners to access information by themselves at any time (Fahad, 2011). The high willingness of the interviewed teachers to use technology to support learning means that they are part of the contemporary learning environment in terms of implementing multiple creative possibilities for student development

### **6.4 PARTICIPANTS' PERCEPTION OF (TPACK)**

#### **6.4.1 Technology knowledge (TK)**

The EFL teachers participating in the present study had high technology knowledge related to the specific context of the EFL classroom. They argued that their lessons were technology infused, that means they incorporated the element of TK from the TPACK framework. Solid technology knowledge serves as a significant indicator of the EFL teachers' willingness to embrace technology for teaching purposes. High TK implies that teachers are aware of the necessity to be proficient in technology for maintaining high-quality instruction.

The study showed that most participants (82.4%) knew how to solve technical problems. This implies that whenever they were faced with technical challenges in the classroom, learning would not be disrupted but could be perceived as an opportunity through which students could also gain technical knowledge.

Apart from problem-solving skills, the study further noted that a majority of participants (89.2%) possessed skills that are necessary to use digital technology. This finding concurs with that of Christensen and Knezek (2008), who further asserted that possession of the required technical skills is the only sure way of maximising the effectiveness of software and hardware technological solutions and applications in learning. Therefore, the results suggest that EFL teachers in Saudi Arabia are well placed to improve student's learning outcomes through the use of available technology.

Interestingly, all participants expressed the opinion that they could learn technology easily. This is quite encouraging for the feasibility of digital technology implementation in teaching, which according to Graham et al. (2009) and Kuo (2008) is closely tied to the positive attitude teachers have towards new knowledge on technology and its pedagogical use in classroom. Therefore, this study implies that participants who had the knowledge of different technologies (79.5%) were due to positive attitude that majority of EFL teachers have developed towards technology. Possession of broad knowledge implies that technology users, including EFL teachers, can use different approaches and methods while using technology in the classroom (Graham, et al., 2009). It can be reasoned that possession of skills in

different technologies would improve efficiency during learning and give much flexibility, in that failure or inaccessibility of a particular technology need not hamper the learning process (Gao, Tan, Wang, Wong & Choy, 2011).

#### **6.4.2 Pedagogical knowledge (PK)**

PK was found to be positively related to the EFL teachers' determination to utilise technology in the EFL classroom. The interviewed EFL teachers demonstrated their focus on generating sufficient PK in terms of how their students learn. Moreover, the satisfactory perception of the teachers' PK means that the teaching approaches they implement in the classroom are sufficient and corresponding to the students' needs and goals. Elements of the EFL teachers' PK that need further elaboration include technological methods of student assessment and knowledge of various theories pertaining to student learning.

In the PK survey, a large majority (98.6%) responded that they knew how to assess students' performance in the classroom. This implies that students will be awarded the right teaching approach in English, and non-performing students or below-average students will be handled with a different teaching approach. Evaluation of students' performances and implementation of proactive handling of students with different performance level is highly dependent on teaching experience (Almodaires, 2009). In this regard, this study showed that the majority of participants (75.0%) considered themselves to be experienced teachers, which could be an assurance of quality learning outcomes.

In regard to teacher's ability to manage the classroom, a large majority of participants (95.5%) concurred with the statement that they know how to organise and maintain classroom management. This ability adds to quality learning outcomes, as both teacher and students will have a comfortable environment in which to teach and learn. Good classroom management and organisation allows free teacher-student movement and improves concentration during learning sessions (Angeli & Valanides, 2009). Similarly, the majority of participants believed that they could adopt their teaching styles to different learners. This implies that technology must be applied in varying proportions and dimensions to different students based on their learning abilities (Angeli & Valanides, 2009).

#### **6.4.3 Content knowledge (CK)**

The surveyed EFL teachers had insufficient CK; they did not adequately concentrate on the college subject matter of the English language. Although these teachers had substantial knowledge of particular concepts and theories of how to teach EFL to Saudi Arabian students, they lacked practical experience of important conceptual frameworks related to widely recognised ways of developing knowledge.

In the CK survey, a large majority of participants (97.3%) reported that they had sufficient knowledge about the English language. This high proportion is probably due in large part to the fact that most of these participants (67.6%) had extensive experience of practising English-language skills in Western societies. This finding concurred with Khan (2011), who also asserts that majority of Arab speakers have chances to learn EFL in the English native speaking nations.



The majority of surveyed EFL teachers working in technical colleges (79.5%) are able to develop an English language course. Based on this fact, it can be seen that this would open more opportunities for other English teachers. In order to develop teachers' English language, a large majority of participants (97.2%) indicated that they have different strategies of developing English language proficiency such as reading and watching. These strategies, as revealed by Hughes (2005), can help students with various problems.

#### **6.4.4 Technological pedagogical knowledge (TPK)**

An important finding was that the interviewed EFL teachers believed that their TPK needed to be further developed in order to obtain better results in the future. Even though the majority of the teachers exhibited strong willingness to implement technology in the EFL classroom, this was not enough to complement their TPK. Aspects mentioned by the participants related to particular affordances and restrictions of technology used for educational purposes. This implies that some of the EFL teachers lacked sufficient self-confidence to implement technological tools in the EFL classroom. Nevertheless, most of the younger teachers in the sample were confident about utilising online collaboration tools that were perceived as a significant way to facilitate the social and cultural aspects of student learning.

A majority of participants reported that they used a variety of software (typically MS Word, PowerPoint and Photoshop) for preparing lesson plans (86.5%) and presenting lessons (87.3%). Use of software in the preparation and presentation of lesson boosts teacher's morale and students' enthusiasm towards learning

(Mishra & Koehler, 2006) hence this improves teaching potential amidst various challenges (Doering, Scharber, Miller & Veletsianos, 2009).

Evaluation of student's performance presents challenges to teachers, especially when the students are numerous and the teacher wants to assign various grades and comments to different scores (Gugiu & Gugiu, 2013). However, in the current use of technology software like Word and Excel, this is no longer a problem. As noted above, in this study, most participants used a variety of software when evaluating students. It can be argued that the use of digital technology in student assessment improves fairness and increases teachers' output relative to a manual evaluation system.

The use of Word in evaluating students, as reported by the majority in this study, suggests that EFL teachers in Saudi Arabia are well placed to identify and rectify students' language problems using the *Spelling and Grammar* check tool (M Levy, 1997). However, Mishra and Koehler (2006) reasoned that poor choice of technology can lead to poor outcomes in classroom teaching and learning, thus the study evaluated how Saudi EFL teachers choose to use the software. It was also imperative for this study to examine this line of argument so as to gauge the learning-teaching outcomes in Saudi Arabia. In this regard, a large majority of participants (91.8%) reported that they chose technologies that enhanced their teaching process. Logically, this would eliminate poor teaching and learning outcomes in Saudi Arabia.

#### **6.4.5 Technological content knowledge (TCK)**

Most of the EFL teachers participating in this study voiced their belief that they needed more training opportunities to develop the dimension of TCK in the long term. Some teachers obviously lacked knowledge of ways to use technology in the EFL classroom. The insufficient perception of TCK manifested by most of the interviewed teachers implies that their students may fail to conceptualise specific information related to learning EFL. For that reason, it is important to educate EFL teachers about new strategies of teaching content in the context of Saudi Arabia.

Despite some teachers admitting that they lacked sufficient TCK, most participants (94.5%) reported knowledge about technologies that can be used for teaching English as a foreign language. This response was closely related to the participants' ability to choose the correct software to use in preparing and presenting lessons as well as in evaluating students' performance. These results suggest that Saudi EFL teachers are not only efficient in choosing but also in using the right technologies to teach English.

A large majority of participants (94.5%) indicated that they looked for online resources when selecting material to use for English language classes. In as much as online learning software are regularly subscribed to at a cost (Masie, 2002), these responses suggested that the majority of Saudi EFL teachers can access at least some open-source software for teaching (Hiebert & Morris, 2012). It seems plausible that teachers would influence their students to adopt this online-search tendency, thereby enhancing the entire learning process.

The evidence of the participants' familiarity with online searching could further be used to justify why most of them (86.3%) can communicate orally in English using technology such as Skype, chatrooms, Viber and Tango. In this regard, it can be asserted that these online applications are free and were only charged based on the amount of time spent using the website (Lundeberg, Bergland, Klyczek & Hoffman, 2003). With the use of Skype, Chatrooms, Viber and Tango technologies, Littlejohn and Pegler (2007) asserts that teachers with visual problems or blindness can learn with ease then transfer the knowledge learnt to the students in the classroom.

#### **6.4.6 Pedagogical content knowledge (PCK)**

As was the case with TCK, the researcher found that teachers' perceptions of PCK were insufficient. The combination of pedagogy and content failed to be done in an effective manner in most of the cases. Making the subject of teaching EFL understandable to learners is an essential aspect of the PCK dimension that must be realised by EFL teachers currently working in Saudi Arabia.

Almost all (95.5%) of participants concurred with the statement that they use diverse teaching strategies in facilitating the teaching of EFL. These diverse strategies make learning processes flexible to students with learning potentials (Alayyar, Fisser & Voogt, 2012). In addition, a majority of participants (73.0%) agreed or strongly agreed that they give tests in English that address both lower- and higher-order thinking, which encourages high flexibility in learning by accommodating both slow and fast learners (Niemi et al., 2011). Similarly, most participants (80.8%) reported that they implement teaching methods to help slow learners in their EFL classes, giving equal opportunities to all EFL learners. This cannot be achieved without proper selection of effective methods, which a majority (89.2%) reported that they were capable of doing. In summary, EFL teachers surveyed in this study showed a high level of use of technology when delivering lessons in EFL.

#### **6.4.7 Technological pedagogical content knowledge (TPCK)**

The EFL teachers participating in the study understood the importance of the TPACK framework for achieving better educational results in the EFL learning environment in Saudi Arabia. However, gaps were identified in terms of considering the interrelations between CK, TK and PK, especially when the EFL teachers needed to make decisions on how to use technology for teaching EFL. EFL teachers in Saudi Arabia must make greater efforts to understand the complex relationships between technologies, teaching and specific content.

In attempting to avoid assumptions about the transfer of teachers' knowledge to students (Van, 2001), this study examined the ability of teachers to

use technology for English teaching. It revealed that a large majority of participants (93.2%) were able to use technology in English language teaching (on the basis of self-report). Therefore, the study's results are reason for much optimism that EFL teachers in Saudi Arabia are effectively transferring their English knowledge to students.

Findings also showed that a majority of participants (85.1%) believed they could make classes interesting and stimulating by using technology in English language teaching. As stimulation and amusement are important precursors to learning, these results imply that EFL teachers in Saudi Arabia are able to use technology in fostering high concentration levels among the students (Koehler & Mishra, 2008). All participants believed that it is important to make use of technology in teaching EFL - a finding that is in agreement with previous studies (e.g., Arslan & Şahin-Kızıl, 2010; Koehler & Mishra, 2008).

## **6.5 FACTORS THAT AFFECT EFL TEACHERS' PERCEPTIONS OF TECHNOLOGY USE**

Factor analysis indicated seven factors that affect EFL teachers' perceptions of technology use in the classroom. The seven factors do not align with factors identified in the TPACK structure. The result was significant as no research had indicated a similar result. The seven factors were: use of technology; technology and pedagogy knowledge; enjoyment; teaching strategies; use of software; communication; and technology that assists learning.

### **6.5.1 Use of technology**

EFL teachers participating in the study considered the importance of technology and its positive impact on enhancing students' learning. The teachers indicated that regular access to the Internet helped them gather adequate information and learning material, which, in turn, enabled them to significantly boost the academic performance of their students (Boas, 2011). The availability of various online resources such as dictionaries and translators additionally motivated EFL teachers to improve their instruction. The belief that students should have technology access in every classroom was an important factor guiding the efforts of EFL teachers. The teachers felt that technology extensively contributed to making learning an interesting and exciting activity to the students (Gilakjani & Leong, 2012). Moreover, the aspect of freedom in the precise use of technology enabled both the teachers and students to demonstrate their potential through various activities.

The process of teaching EFL is considered complex and multidimensional and EFL teachers outlined their responsibility to provide effective instruction. In fact, the process of using technology in the EFL classroom implied a high level of flexibility as the teachers were able to adapt the teaching to different student responses (Gilakjani & Leong, 2012). The use of technology in the classroom gave the teachers an opportunity to create a reinforcing environment in which the use of the target language was a completely natural activity (Yamauchi, 2009). The access to authentic information through technology ensured EFL teachers' readiness to implement various innovative and creative teaching strategies that were thought to improve students' performance.

#### **6.5.2 Technology and pedagogy knowledge**

The factors of technology and pedagogy knowledge highlighted that EFL teachers felt comfortable practicing their pedagogy knowledge through the use of technology in the classroom. A common aspect of their pedagogy knowledge related to their ability to create and edit text using MS Word (Gilakjani & Leong, 2012). Moreover, EFL teachers believed that they possessed adequate knowledge to solve their own technical problems, which demonstrated their self-confidence and competence in dealing with pressure in their workplace (Yamauchi, 2009). That EFL teachers acknowledged the importance of using technology in the classroom indicated that they had the necessary technical skills to initiate a positive change in students' learning of EFL.

Technology and pedagogy knowledge was undoubtedly important to determining teachers' readiness to teach specific concepts to students. EFL teachers



indicated that they could master technology easily and that they had the potential to do so in an efficient manner (Zhong & Shen, 2002). The teachers participating in the study were concerned about identifying presentation techniques that could motivate the students to perform better in the classroom. It was concluded that EFL teachers demonstrated significant motivation to select technologies that helped students understand the English language more easily. In other words, the teachers were ready to experiment with a variety of technologies available for educational purposes. This element of creativity is highly valuable to the teaching and learning process (Gilakjani & Leong, 2012). It is also noteworthy that the EFL teachers had sufficient knowledge of the English language in order to feel confident linking technology and pedagogy knowledge in a relevant way.

### **6.5.3 Enjoyment**

The results of this study showed that EFL teachers enjoyed the implementation of technology in the classroom. Creating PowerPoint presentations was identified as one of the most enjoyable activities in the teaching and learning process. This was considered a creative practice that allowed teachers to share their valuable pedagogical insights on teaching EFL in the classroom (Stanley, 2013). In addition, the sense of enjoyment shared by EFL teachers was heightened by the knowledge that students, too, enjoyed learning with technology. Another dimension of teachers' enjoyment was associated with their motivation and preparedness to deal with specific teaching tasks in an efficient manner. For instance, EFL teachers regularly created brief lesson plans in relation to technology use. In this way, they were able to outline important aspects of the link between

technology use, expected learning outcomes and enjoyment (Folse, 2006). Such structured activities obviously brought the teachers a strong sense of fulfilment.

In fact, the preparation and use of detailed plans that included the implementation of technology in the EFL classroom reassured EFL teachers about their own creative potential to initiate meaningful change in terms of students' academic performance (Boas, 2011). This also implied that the teachers participating in the study were highly self-motivated to attain substantial success in their teaching practice. These teachers were committed to creating stimulating classes that involved the use of technology to enhance EFL learning. This explains why the factor of enjoyment was strongly correlated with EFL teachers' vision for education (Gilakjani & Leong, 2012). In other words, the teachers enjoyed the fact that technology use in the classroom could help them further their teaching careers in the future.

#### **6.5.4 Teaching strategies**

The application of teaching strategies corresponded to the educational needs and expectations of students. EFL teachers were confident in explaining to students how to use computers to improve their learning. Likewise, the ability of the teachers to develop an English language course was suggestive of their professional attitude and readiness to encounter various challenges in the dynamic EFL classroom (Boas, 2011). A number of EFL teachers shared the view that their extensive pedagogical experience could help them motivate students to enhance their knowledge of the English language. An essential teaching strategy, demonstrated by the teachers participating in this study, pertained to their

structured organization and maintenance of classroom activities (Folse, 2006). EFL teachers' knowledge and experience of classroom management had a positive impact on the way in which they communicated important messages to the students.

Another key teaching strategy identified in this study was associated with the potential of EFL teachers to adapt their teaching style to different learners. This refers to the teachers' awareness of the strengths and weaknesses of each student and their ability to approach the specific needs of learners. The use of diverse teaching strategies was considered fundamental to enhancing the quality of instruction in the EFL classroom (Folse, 2006). The majority of the teachers participating in the study confirmed their use of English tests that required both lower- and higher-order thinking on the part of the students, considering learners' different stages of preparation and knowledge of the English language (Shuyan & Hartsell, 2012). The presence of slow learners in the EFL classroom has been recognized as a motivating factor for teachers to improve their teaching strategies.

#### **6.5.5 Use of software**

The use of software as an inseparable part of the technology influence in the EFL classroom has been favoured by EFL teachers. Yet the majority of the participants in the study were not in favour of using mapping concepts for teaching EFL. EFL teachers considered the implementation of other software items to motivate students to learn (Shuyan & Hartsell, 2012). They endorsed the use of multimedia to enhance student outcomes. The use of various multimedia applications allowed teachers to show their creative skills in teaching EFL.

Moreover, the teachers also recognized that some students felt uncomfortable with certain software applications, requiring them to be more tolerant towards the different attitudes exhibited by learners in the teaching and learning process (Folse, 2006). The use of proper software was considered an essential tool to improve the reading and writing skills of students learning EFL (Gilakjani & Leong, 2012). The process of embracing technology in the EFL classroom, though, required adequate skills on the part of teachers in terms of combining the optimal features of different software applications in practice.

#### **6.5.6 Communication**

Communication highlighted the EFL teachers' willingness to initiate and maintain two-fold, open and flexible communication with students. Results emphasized that visual communication facilitated the instruction for students (Boas, 2011). Some communication tools such as Skype and videoconferencing were found useful in making the process of learning EFL easier for students. The EFL teachers demonstrated a high level of motivation to participate in extensive group discussions on various language issues. Communication with visuals emerged as a key factor in effective teaching and learning. It is important to emphasize that communication between teachers and students substantially improved through use of technology in the teaching and learning process (Shuyan & Hartsell, 2012). However, only the knowledgeable and competent teachers recognized the importance of technology in enhancing communication in the EFL classroom. It has been indicated that technology use not only increased students' motivation to learn

the target language but also reduced pressure and fear associated with learning a new language.

Clear communication initiated by EFL teachers helped adapt the instruction to different learning styles prevalent in the classroom. In addition, the teachers participating in the study felt that the promotion of clear communication helped them in the assessment of students (Folse, 2006). To identify the optimal strategy for assessing students' academic performance, teachers were willing to experiment with specific options available to them. Interactivity allowed EFL teachers to be more communication-oriented in terms of conveying important messages to students about learning. They demonstrated their responsibility to encourage students to interact with each other frequently over the Internet. For instance, communication via Skype helped learners improve their speaking skills at a rapid pace (Boas, 2011). Overall, the factor of communication was perceived as extremely important in facilitating adequate academic performance.

#### **6.5.7 Technology that assists learning**

The factor of technology that assists learning refers to EFL teachers' awareness of the necessity to use the right types of technology that can assist and support learning. The majority of the participants in the study indicated that the use of technology in the EFL classroom enabled them to simplify teaching (Gilakjani & Leong, 2012). In this way, teachers declared their intention to make the teaching of EFL an easier and more convenient process for students. Learners need to enjoy learning English through the use of technology. Accordingly, teachers accepted their immense responsibility to provide appropriately structured instruction with

the help of assistive technology (Folse, 2006). Furthermore, EFL teachers indicated that technology could facilitate teaching.

It is important to use technology in a way that encourages student to learn in the most efficient manner. For that reason, the technology that assists these learning factors was considered a significant step toward ensuring consistency in the use of technology in the EFL classroom (Shuyan & Hartsell, 2012). The selection of relevant technological applications depended on the training and expertise of teachers, as well as on their willingness to implement technology in the educational process. Undoubtedly, some EFL teachers were uncomfortable about using technology-assisted learning and favoured traditional methods of teaching EFL.

## CHAPTER SEVEN

### Implications, Limitations and Conclusion

#### 7.1 IMPLICATIONS

This study illustrated that EFL teaching in Saudi Arabia is complex and occurs in a challenging learning environment. The study focuses on EFL teachers' use of technology to support learning, their willingness to implement technology and their perception of TPACK produced useful findings, all of which were thoroughly discussed in the previous chapters. Three major and essential components of EFL teachers' knowledge are an understanding of content, comprehension of the importance of teaching and a deep understanding of technological applications in the EFL classroom (Mahdi & Naim, 2012). Yet the complexity of applying technology when teaching EFL in Saudi Arabia is due to the personal backgrounds and experience of the EFL teachers as well as to their attitudes demonstrated in their teaching practice. The EFL teachers' sensitivity towards the implementation of technology to support teaching is rather extensive (Abdallah, 2011). The results obtained in this study suggest that EFL teachers in Saudi Arabia need to increase the quality and efficiency of their teaching through greater use of technology.

Technology will continue to advance, which means that EFL teachers will be provided with further and more significant methods of using technological knowledge to help students develop their English language capabilities (Quillen, 2012). EFL teachers believed that TPACK framework created new ways for them to

communicate and for students to learn, implying that technical colleges throughout Saudi Arabia should invest in various technological applications, software and equipment to facilitate the process of technology integration in the EFL classroom.

Those teachers who accept the implementation of technology should be encouraged to be creative and innovative in their daily practice so they can produce even better results in their EFL classrooms. It is recommended that such teachers should focus on appealing technological strategies for initiating a specific cultural discussion of the English language, which would help Arab students develop a relevant identity in the educational context (Semiz & Ince, 2012). Therefore, an important implication of the research presented in this thesis is the necessity of removing barriers that impede English language learning among students enrolled in Saudi Arabian technical colleges.

Another significant implication of this research is associated with the status of those EFL teachers who selected strategies for teaching that were facilitated by technology. A thorough consideration of ways to improve EFL teaching practice in Saudi Arabia must refer to the culture and the dominant religious beliefs of the Saudi Arabian context (Abdallah, 2011). Cultural and religious sensitivity is required while teaching EFL if better educational results are to be achieved.

The present study identified a subset of EFL teachers in Saudi Arabian technical colleges that rejects technological forms of EFL teaching in favour of traditional methods. The TVTC should work to improve the attitudes and beliefs of this group of conservative teachers who rejected the implementation of change in



the EFL classroom (Yamauchi, 2009). It is important to provide extensive training opportunities for such teachers so that they can gradually come to appreciate the value of the implementation of technological applications to support the learning of Arab students.

This current research indicated that a TPACK framework was not supported by factor analysis. To date, no research has been found to describe the validation of the TPACK instrument. Accordingly, further research on TPACK validation is a crucial need as it is important to know whether factor analysis supported TPACK framework or not. In future research, a larger sample should be used to further investigation.

The data was collected in 2011 but no doubt that the reading will change in the next few years. Educational processes are still improving, especially in developing countries.

## **7.2 LIMITATIONS**

Although the study produced important findings with respect to technology in EFL teaching in Saudi Arabian technical colleges, several limitations must be discussed. A significant limitation of the present study is that the participants consisted solely of male EFL teachers. However, this is a cultural norm in Saudi Arabia; women are restricted in terms of their education and employment opportunities.

The major research tool used to collect information – the online survey – has specific limitations. A major disadvantage of the method is limited sampling ability

and participants' availability. Another disadvantage of the utilised online survey relates to cooperation problems.

The second method used to obtain information from participants was interviews, which also has limitations. One such is that the interviewer could unintentionally bias the data, especially if the questions were asked inconsistently across participants. This was partly observed in the present study considering the fact that the type of interviews used with the participants was telephone interviews. Likewise, the limitation of an interviewer's bias was evident to a certain degree such that particular closed questions were asked.

An important limitation is that participants were chosen from technical colleges in Saudi Arabia. Accordingly, the results of this study can only be generalised to other technical colleges but not to universities or secondary learning institutions, which would be expected to have a more diverse pool of faculty members teaching EFL.

Finally, the results of this study can only be generalised to EFL teachers and not ESL teachers, since the research focused on a setting where English is not the primary language. Studies of ESL teachers who operated in environments where English is a primary language may find different perceptions of use of technology, willingness and TPACK.

### 7.3 CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

This study investigated the use of technology to support learning, willingness to use technology for teaching purposes and perception of TPACK among EFL teachers working in of Saudi Arabia in 2011. It was noted that most EFL teachers demonstrated a favourable attitude towards the implementation of technology in the EFL classroom. The favourable attitude toward the use of technology was supported by Abdullah (2011). The majority of the participants in the study claimed that technology-enabled communication with students was beneficial; and that the use of multiple visual aids in the teaching and learning process was of crucial importance. The researcher has attempted to argue, with the support of the literature, that the implementation of technological applications in the Saudi Arabian EFL learning environment contributes to the design and maintenance of effective and reliable EFL teaching (Semiz & Ince, 2012). Access to technology allowed EFL teachers to interpret certain information in an efficient way. One of the major conclusions of this study was that most EFL teachers in Saudi Arabia believe that students need to have access to technology in every classroom. Most of the EFL teachers participating in the study strongly agreed that their students enjoyed using technology for learning and that doing so was productive.

Despite the mostly positive assessments described above, analyses of interview data revealed that some participants did not favour the use of technology in the EFL classroom. Therefore, future research in the field should focus on the adoption of strategies to enhance EFL teachers' use of technology to support learning (Fahad, 2011). The study showed that most teachers that were interviewed

belong to the younger generation of EFL teachers based in Saudi Arabia. This characteristic was found to be important in determining the EFL teachers' use of technology in the classroom, their willingness to use technology and their perception of TPACK. Undoubtedly, younger teachers tend to favour the extensive use of technology for teaching purposes simply because they are the product of the highly technological society in which they live and work. On the other hand, the study's sample included older EFL teachers who held rather conservative and cautious views on the implementation of technology in the classroom.

Those EFL teachers who were willing to use technology in the classroom believed that technology helped them expand their knowledge and effectiveness. On the contrary, teachers demonstrating low willingness to use technology in the classroom argued that technological applications interfered with their teaching methods, a finding supported by Cimermanova (2011).

The dimension of EFL teachers' willingness to use technology to support learning indicated that teachers' readiness to integrate technology while creating the solid bases of student-centred learning. The willingness of teachers to implement technology in the EFL classroom implied that they are competent and knowledgeable enough to deal with specific educational challenges. It can be concluded that the crucial role of technology in teaching EFL in Saudi Arabia is in enabling students to organise their learning process independently. Technology can help students become active participants in learning that has both cultural and social dimensions. For that reason, the EFL teachers who demonstrated a high

willingness to use technology in the classroom were confident that doing so provided a unique, active experience for students.

The TPACK framework discussed in this study was perceived as valuable in producing certain implications for educational practice. It has been demonstrated that the TPACK framework enables EFL teachers in Saudi Arabia to expand certain opportunities for technology integration in the classroom. The exploration of the specific knowledge that is expected from the EFL teachers in their teaching practice yielded important conclusions that should be considered in future studies. The TPACK perception of EFL teachers in Saudi Arabia indicated their readiness to develop sufficient techniques to describe the precise way in which technology-related knowledge is implemented in the EFL classroom. The types of knowledge EFL teachers need in terms of content, pedagogy, specific educational contexts, technology and interactions were thoroughly emphasised by the results of this present study. Although the teachers who participated in the study gave opinions regarding the use of technology in the EFL classroom, they were considered to be in a relevant position to understand the various perceptions of technology integration in Saudi Arabia.

In conclusion, the TPACK framework offers a useful frame to which to explore the education and training of EFL teachers in Saudi Arabia. However, the TPACK structure was not supported by factor analysis. This might, however, be due to the small sample size. EFL teachers should be provided with professional development so that they can be encouraged, supported and more willing to implement technology in order to support learning. The results of this study allow

individuals and researchers in the field of education to understand the process of technology integration in the Saudi Arabian EFL classroom so that they can move beyond traditional approaches used in teaching EFL. As a result, student learning is meaningfully enhanced.

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## APPENDICES

### Appendix 1: Ethics approval



**MONASH University**

**Monash University Human Research Ethics Committee (MUHREC)**  
Research Office

#### Human Ethics Certificate of Approval

**Date:** 27 September 2012

**Project Number:** CF12/2686 – 2012001447

**Project Title:** English as a foreign language (EFL) teachers' engagement with technology: A Saudi Arabian perspective

**Chief Investigator:** Assoc Prof Bruce Waldrip

**Approved:** From: 27 September 2012 To: 27 September 2017

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#### Terms of approval

1. The Chief investigator is responsible for ensuring that permission letters are obtained, if relevant, and a copy forwarded to MUHREC before any data collection can occur at the specified organisation. **Failure to provide permission letters to MUHREC before data collection commences is in breach of the National Statement on Ethical Conduct in Human Research and the Australian Code for the Responsible Conduct of Research.**
2. Approval is only valid whilst you hold a position at Monash University.
3. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval and to ensure the project is conducted as approved by MUHREC.
4. You should notify MUHREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
5. The Explanatory Statement must be on Monash University letterhead and the Monash University complaints clause must contain your project number.
6. **Amendments to the approved project (including changes in personnel):** Requires the submission of a Request for Amendment form to MUHREC and must not begin without written approval from MUHREC. Substantial variations may require a new application.
7. **Future correspondence:** Please quote the project number and project title above in any further correspondence.
8. **Annual reports:** Continued approval of this project is dependent on the submission of an Annual Report. This is determined by the date of your letter of approval.
9. **Final report:** A Final Report should be provided at the conclusion of the project. MUHREC should be notified if the project is discontinued before the expected date of completion.
10. **Monitoring:** Projects may be subject to an audit or any other form of monitoring by MUHREC at any time.
11. **Retention and storage of data:** The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.



Professor Ben Canny  
Chair, MUHREC

cc: Mr Abdullah Salem Alahmari

## Appendix 2: Age means value

How old are you (DEM)		F 1	F 2	F 3	F 4	F 5	F 6	F 7
25 or younger	Mean	1.71	1.20	1.03	1.00	1.06	1.09	2.21
n = 9	Std. Deviation	0.64	0.26	0.088	0.00	0.17	0.18	0.38
26 to 35	Mean	2.42	1.39	1.42	1.52	1.37	1.36	2.03
n = 44	Std. Deviation	0.66	0.42	0.63	0.77	0.40	0.45	0.61
36 to 45	Mean	2.63	1.64	1.78	1.91	1.76	1.56	1.87
n = 37	Std. Deviation	0.74	0.52	0.74	0.82	0.77	0.57	0.72
46 or older	Mean	2.44	2.24	2.00	2.25	1.66	2.08	1.91
n = 3	Std. Deviation	0.89	0.86	0.25	0.66	0.38	0.38	0.62
Total	Mean	2.43	1.50	1.54	1.65	1.50	1.44	1.98
n = 93	Std. Deviation	0.73	0.51	0.68	0.79	0.60	0.51	0.63

### Appendix 3: Qualifications means value

What is the highest qualification in English language teaching you have achieved (DEM)		F 1	F 2	F 3	F 4	F 5	F 6	F 7
Bachelor's (Art)	Mean	1.25	1.53	1.50	1.25	1.00	1.00	1.87
n = 4	Std. Deviation	0.35	0.30	0.70	0.35	0.00	0.00	0.17
Bachelor's (Education)	Mean	2.49	1.47	1.30	1.49	1.43	1.46	2.37
n = 40	Std. Deviation	0.65	0.55	0.46	0.73	0.53	0.48	0.38
Master	Mean	2.43	1.51	1.79	1.82	1.59	1.45	1.64
n = 46	Std. Deviation	0.79	0.45	0.78	0.83	0.67	0.52	0.64
PhD	Mean	2.61	1.68	1.33	1.6	1.50	1.50	1.83
n = 3	Std. Deviation	0.70	0.92	0.57	1.15	0.50	0.86	0.76
Total	Mean	2.43	1.50	1.54	1.65	1.50	1.44	1.98
n = 93	Std. Deviation	0.73	0.51	0.68	0.79	0.60	0.51	0.63

#### Appendix 4: Years of experience means value

How many years have you been teaching English (DEM)?		F 1	F 2	F 3	F 4	F 5	F 6	F 7
1-5	Mean	1.84	1.20	1.16	1.05	1.13	1.11	2.25
n = 13	Std. Deviation	0.70	0.24	0.41	0.16	0.28	0.18	0.37
6-10	Mean	1.38	1.40	1.45	1.59	2.51	1.39	2.16
n = 31	Std. Deviation	0.68	0.43	0.71	0.84	0.42	0.46	0.59
11-15	Mean	2.57	1.51	1.70	1.81	1.63	1.49	1.78
n = 38	Std. Deviation	0.72	0.46	0.75	0.88	0.77	0.57	0.67
16 or more	Mean	2.42	1.99	1.70	1.90	1.80	1.75	1.82
n = 11	Std. Deviation	0.75	0.65	0.38	0.50	0.53	0.50	0.69
Total	Mean	2.43	1.50	1.54	1.65	1.50	1.44	1.98
n = 93	Std. Deviation	0.73	0.51	0.68	0.79	0.60	0.51	0.63

## Appendix 5: Survey item

Qualtrics Survey Software

<https://co1.qualtrics.com/ControlPanel/Ajax.php?act...>

### Participants Consent

#I (the participant) have read the information contained in the Information Sheet for Participants and any questions I have asked have been answered to my satisfaction.  
I agree to participate in this activity which will take approximately 20 minutes, realising that I may withdraw at any time.

I agree that research data gathered for the study will be published, and my identity will be unidentifiable due to the strict confidentiality explained in the information sheet.

In preservation of anonymity, I understand that no name or signature is required of me to give consent. By activating the proceed "Yes" button below I am agreeing to participate in this study.

Should you have any complaints concerning the manner in which this research is conducted, please contact the Research Ethics Officer at the following address:

Research Services  
University of New England  
Armidale, NSW 2351.

Telephone: [REDACTED] Facsimile [REDACTED]

Email: [REDACTED]

☐ Yes

☐ No

### Demographics

Which college do you currently work for?

في اي كلية تقنية تعمل الآن؟

[REDACTED]

How old are you?

كم عمرك؟

25 or younger

☐

26 to 35

☐

36 to 45

☐

46 or older

☐

What is the highest qualification in English language teaching you have achieved?

ما هي اعلى شهادة حصلت عليها في تدريس اللغة الانجليزية؟

Bachelor (Art)

☐

Bachelor (Education)

☐

Master

☐

PhD

☐

How many years have you been teaching English?

كم من السنوات وانت تدرس اللغة الانجليزية؟

1-5

☐

6-10

☐

11-15

☐

16 or more

☐

## Use of Technology

## In my classroom I use technology to...

Create and edit text (e.g., Word)

كتابة و إضافة النصوص مثل وورد

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

Create presentations (e.g., PowerPoint)

إنشاء العروض التقديمية مثل البوربوينت

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

Create graphics (e.g., Paint)

إنشاء الجرافيكس مثل الرسام

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

Communicate by text (e.g., chat, email)

(التواصل عن طريق النص مثل الدردشة والايمل)

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

Communicate with visuals (e.g., Skype, videoconference)

التواصل المرئي مثل سكايب و الدائرة التلفزيونية المغلقة

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

Access the Internet to gather and have information

الدخول الى الانترنت لجمع المعلومات والحصول عليها

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

Access online tools (e.g., dictionary, translator, thesaurus)

الدخول الى ادوات الانترنت مثل القاموس و المترجم و المعكز

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*Demonstrate educational software (e.g., CD-ROM, learning objects)*

شرح البرامج التعليمية مثل السي دي و مواد التعلم

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*Map concepts (e.g., Kidspiration, Inspiration)*

خريطة المفاهيم مثل كيدز سبيريشن و الإيحاء

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*Develop web pages (e.g., FrontPage)*

تطوير صفحات الانترنت مثل فرونت بيج

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*Develop multimedia (e.g., HyperStudio)*

تطوير الوسائط المتعددة مثل هايبر ستوديو

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*Engage in virtual worlds, simulations (e.g., Secondlife)*

الدخول في العالم الافتراضي والمحاكاة مثال سكندلايف

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

#### Willingness

*I believe that students should have access to technology in every classroom.*

أعتقد أنه يجب على الطلاب الحصول على منفذ للتكنولوجيا في كل فصل دراسي

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I believe that students enjoy using technology in the classroom.*

أعتقد بأن الطلاب يستمتعون باستخدام التكنولوجيا في الفصل الدراسي

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I believe that students will learn more if technologies are used in the classroom.*

أعتقد بأن الطلاب سيتعلمون أكثر في حال استخدام التكنولوجيا في الفصل الدراسي

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I think that using technologies in the classroom will make teaching simpler.*

أعتقد بأن استخدام التكنولوجيا في الفصل الدراسي سوف يجعل التدريس أبسط

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I think that using technology to facilitate teaching will be boring for my students.*

أعتقد أن استخدام التكنولوجيا لتسهيل عملية التدريس سوف تكون مملة لطلابي

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I think that using technology in the classroom will interfere with my teaching.*

أعتقد أن استخدام التكنولوجيا في الفصل الدراسي سيتداخل مع تدريسي

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I feel nervous about having to use a technology while teaching.*

أشعر بالقلق من الحاجة لاستخدام التكنولوجيا أثناء التدريس

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I feel confident learning about new software or tools (e.g. PowerPoint) on the computer.*

أشعر بالثقة عند تعلم برامج و أدوات (مثل البوربوينت) في جهاز الكمبيوتر

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I feel confident when I use technology for teaching in the classroom.*

أشعر بالثقة عند استخدام التكنولوجيا في قاعة الفصل الدراسي

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I feel confident when assisting my students to use computers in the classroom.*

أشعر بالثقة عند مساعدة طلابي في استخدام الكمبيوتر داخل الفصل

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I want to use technologies in the classroom because it will make my teaching more interesting.*

أريد استخدام التكنولوجيا في الفصل الدراسي لأنه سيجعل تدريسي مثيرا للاهتمام

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐



*I want to use technology in the classroom because it will improve my students' learning.*

أريد استخدام التكنولوجيا في قاعة الفصل الدراسي لأنه سوف يطور عقلية التعلم لطالبي

Strongly Agree



Agree



Neutral



Disagree



Strongly Disagree



*I want to find new and interesting ways of using technology in the classroom.*

أريد أن أجد طرق جديدة و مثيرة للإهتمام لاستخدام التكنولوجيا في قاعة الفصل الدراسي

Strongly Agree



Agree



Neutral



Disagree



Strongly Disagree



*I prepare short lesson plans for myself in relation to technology use.*

أنا أقم بإعداد خطط لدرس قصير لنفسي فيما يتعلق باستخدام التكنولوجيا

Strongly Agree



Agree



Neutral



Disagree



Strongly Disagree



*I prepare semester length plans that include the use of technology in the classroom.*

أنا أقم بإعداد خطط لمدة سمستر و التي تشمل على استخدام التكنولوجيا في قاعة الفصل الدراسي

Strongly Agree



Agree



Neutral



Disagree



Strongly Disagree



*I prepare plans that include new and interesting ways to use technology in the classroom.*

أنا أقم بإعداد خطط دراسية تشمل على طرق جديدة و مثيرة للإهتمام لاستخدام التكنولوجيا في قاعة الفصل الدراسي

Strongly Agree



Agree



Neutral



Disagree



Strongly Disagree



#### TPACK

*I know how to solve my own technical problems.*

أنا أعرف كيفية التغلب على مشاكل التقنية

Strongly Agree



Agree



Neutral



Disagree



Strongly Disagree



*I have the technical skills I need to use technology.*

لدي المهارات التقنية التي أحتاجها لاستخدام التكنولوجيا

Strongly Agree



Agree



Neutral



Disagree



Strongly Disagree



*I can learn technology easily.*

أستطيع تعلم التكنولوجيا بسهولة

Strongly Agree



Agree



Neutral



Disagree



Strongly Disagree



*I know about a lot of different technologies.*

أعرف الكثير عن مختلف التكنولوجيات

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I use a variety of software (Word, PowerPoint, Photoshop, etc.) preparing for lesson plans.*

أستخدم برامج متنوعة (مثل وورد وپاورپوينت و فوتوشوب الخ.) للإعداد لخطط الدرس

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I use a variety of software (PowerPoint, Flash, Word, etc.) when presenting lessons.*

أستخدم برامج متنوعة (مثل پاورپوينت و فلاش و وورد الخ.) عند تقديم الدروس

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I use a variety of software (Word, PowerPoint, etc.) when evaluating students.*

أستخدم برامج متنوعة (مثل وورد و پاورپوينت الخ.) عند تقييم الطلاب

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I can choose technologies that enhance teaching process.*

أستطيع اختيار التكنولوجيات التي تعزز العملية التعليمية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I know about technologies that I can use for understanding and doing English language.*

أعرف عن التكنولوجيات التي بإمكانني استخدامها لفهم وعمل اللغة الانجليزية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I look for online resources when selecting materials to use for my English language class.*

أبحث عن موارد في الانترنت عند اختيار المواد لاستخدامها في فصل اللغة الانجليزية الخاص بي

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I can communicate orally in English using technology (e.g. Skype, chat rooms Viber and Tango).*

أستطيع التواصل الشفهي باللغة الانجليزية عن طريق استخدام تكنولوجيا مثل سكايب و غرف المحادثة و الفايبر و التانغو

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I view videos on the Internet that are in the English language.*

أشاهد فيديوهات على الانترنت والتي تكون باللغة الانجليزية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I have the ability to use technology in English language teaching.*

لدي القدرة لاستخدام التكنولوجيا في تدريس اللغة الانجليزية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I make my classes interesting and stimulating by using technology in English language teaching.*

اجعل فصولي مثيرة و محفزة من خلال استخدام التكنولوجيا في تدريس اللغة الانجليزية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I can explain how the use of computers can help students to learn the English language.*

استطيع ان اشرح كيف ان استخدام اجهزة الكمبيوتر تستطيع ان تساعد الطلاب في تعلم اللغة الانجليزية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I believe that it is important to make use of technology in teaching English as a foreign language.*

أعتقد أنه من المهم الاستفادة من التكنولوجيا في تدريس اللغة الإنجليزية كلغة أجنبية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I have sufficient knowledge about English language.*

لدي المعرفة الكافية عن اللغة الانجليزية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I have had extensive experience practicing English language in Western society.*

أتيجت لي خبرة واسعة في ممارسة اللغة الإنجليزية في المجتمع الغربي

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I can develop an English language course.*

استطيع ان اطور دورة في اللغة الانجليزية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I have various strategies of developing my English language (e.g. reading and watching).*

لدي مختلف الإستراتيجيات لتطوير لغتي الإنجليزية مثل القراءة والمشاهدة

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I know how to assess student performance in the classroom.*

أنا أعرف كيفية تقييم أداء الطلاب في الفصول الدراسية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I consider myself to be an experienced teacher with sufficient years of experience in pedagogy.*

أنا أعتبر نفسي مُعلما من ذوي الخبرة مع سنوات من الخبرة الكافية في علم التربية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I know how to organise and maintain classroom management.*

أنا أعرف كيفية تنظيم وظبط إدارة الصف

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I can adapt my teaching style to different learners.*

استطيع تكييف (ملائمة) طريقة تدريسي لمختلف المتعلمين

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I use diverse teaching strategies in facilitating the instruction of English as a foreign language.*

استخدام استراتيجيات التدريس المتنوعة في تسهيل تعليم اللغة الإنجليزية كلفة أجنبية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I give tests in English as foreign language subject that address both lower and higher order thinking skills.*

أعطي اختبارات في مادة اللغة الإنجليزية كلفة أجنبية والتي تعالج مهارات الإبداع التفكير المنخفض والعالي

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I implement teaching methods to help slow learners in my EFL class.*

أنا أقوم بتطبيق طرق للتدريس لمساعدة بطيئي التعلم في قاعة فصل اللغة الإنجليزية كلفة أجنبية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

*I can select effective teaching strategies to guide students in EFL.*

أستطيع تحديد استراتيجيات التدريس الفعالة لتوجيه الطلاب في اللغة الإنجليزية كلفة أجنبية

Strongly Agree

☐

Agree

☐

Neutral

☐

Disagree

☐

Strongly Disagree

☐

**Information for optional interview**

In order to increase the quality of this study some participants will be interviewed. If you wish to participate in an interview, please provide your name and contact details here (e.g. Email, Mobile number, Skype account or any communication means you prefer)

لزيادة جودة الدراسة سيتم إجراء مقابلة هاتفية مع بعض المشاركين. في حال رغبتكم في إجراء مقابلة هاتفية مع شخصكم الكريم , نرجو تزويدنا بإسكم و  
بوسيلة اتصال خاصة بكم مثل الإيميل أو رقم الجوال أو حساب برنامج المكايب أو أي وسيلة أخرى تفضلونها